



**SRI RAMAKRISHNA MISSION VIDYALAYA  
POLYTECHNIC COLLEGE**  
(AN AUTONOMOUS & ISO 9001:2015 CERTIFIED INSTITUTION)

**REGULATIONS AND SYLLABUS**

**[APPLICABLE TO STUDENTS ADMITTED FROM  
2021 - 2022 ACADEMIC YEAR ONWARDS]  
(R6 - SCHEME)**

**DIPLOMA IN  
INFORMATION TECHNOLOGY**

# SRI RAMAKRISHNA MISSION VIDYALAYA POLYTECHNIC COLLEGE

(AN AUTONOMOUS INSTITUTION)

## DEPARTMENT OF INFORMATION TECHNOLOGY

### R6 - SCHEME

[Applicable to students admitted from 2021 - 2022 academic year onwards]

## R E G U L A T I O N S

### Description of the Course:

The Course for the full time Diploma in Engineering shall extend over a period of three academic years, consisting of 6 semesters. This curriculum for the diploma course is applicable for the candidates admitted from 2021 - 2022 academic year onwards.

### Eligibility for the Award of Diploma:

No candidate shall be eligible for the Diploma unless he has undergone the prescribed course of study in this College for a period of not less than three academic years when joined in first year and two years if joined under lateral entry scheme in the second year and passed the prescribed examination. The minimum and maximum period for completion of diploma course is as given below:

Diploma Course	Minimum Period	Maximum Period
Full Time Regular	3 Years	6 Years
Full Time (Lateral Entry)	2 Years	5 Years

**Age Limit:** No age limit

### Subjects of Study and Curriculum Outline:

The subjects of study shall be in accordance with the syllabus prescribed from time to time, both in theory & practical. The curriculum outline under R6-Scheme is given in Annexure - I.

### Autonomous Examination - Exam Pattern:

The Autonomous examinations for all the diploma courses are being conducted in the following pattern:

Semester	Span of Study	Examination
I, III & V Sem	June - October	October
II, IV & VI Sem	December - April	April

Autonomous Examinations in all subjects of all the semesters under the scheme of examinations will be conducted at the end of each semester. The internal assessment marks for all the subjects will be awarded on the basis of continuous internal assessment earned during the semester concerned. For each subject 25 marks are allotted for internal assessment and 75 marks are allotted for end semester external examinations.

### Continuous Internal Assessment:

#### A. FOR THEORY SUBJECTS:

The internal assessment marks for a total of 25 marks, which are to be distributed as follows:

#### i) Subject Attendance

**05 Marks**

Award of marks for subject attendance to each subject Theory / Practical will be as per the range given below:

80% - 83%	1 mark
84% - 87%	2 marks
88% - 91%	3 marks
92% - 95%	4 marks
96% - 100%	5 marks

#### ii) Test

**10 Marks**

Two Tests each of 2 hours duration for a total of 50 marks are to be conducted. **05 marks**  
 Out of which the best one will be taken and the marks to be reduced to  
 The Test - III is to be the Model test of 3 hours duration for a total of 100 marks **05 marks**  
 covering all the five units and the question paper will be end semester  
 examination pattern. The marks obtained will be reduced to

**Total 10 marks**

Test	Units	When to conduct	Marks	Duration
Test I	Unit - I & II	End of 6 <sup>th</sup> week	50	2 Hrs
Test II	Unit - III & IV	End of 12 <sup>th</sup> week	50	2 Hrs
Test III	Model Examination: All the 5 units. (End sem. exam question pattern)	End of 16 <sup>th</sup> week	100	3 Hrs

**iii) Assignment 05 Marks**

For each subject three assignments are to be given each for 20 marks and the average marks scored should be reduced for 05 marks.

**iv) Seminar Presentation 05 Marks**

The students have to select the topics either from the subjects or general subjects which will help to improve the grasping capacity as well as the capacity to express the subject in hand. The students will be allowed to prepare the material for the given topic using the library hour and they will be permitted to present the seminar. (For Second Year, the students will be permitted to present the seminar as a group not exceeding six members and each member of the group should participate in the presentation. For the Third Year, the students should present the seminar individually).

The seminar presentation is mandatory for all theory subjects and carries 05 marks for each theory subject. The respective subject faculty may suggest topics to the students and will evaluate the submitted materials and seminar presentation. (2½ marks for the material submitted in writing and 2½ marks for the seminar presentation). For each subject minimum of two seminars are to be given and the average marks scored should be reduced to 05 marks.

All test papers, assignment papers and the seminar presentation written materials after getting the signature with date from the students must be kept in safe custody in the department for verification and audit. It should be preserved for one semester after publication of end semester exam results.

**B. FOR PRACTICAL SUBJECTS:**

The internal assessment mark for a total of 25 marks which are to be distributed as follows:-

a)	Attendance (Award of marks same as theory subjects)	05 Marks
b)	Procedure / observation and tabulation / Other practical related work	10 Marks
c)	Record writing	10 Marks
<b>TOTAL</b>		<b>25 Marks</b>

- All the experiments / exercises indicated in the syllabus should be completed and the same to be given for final semester examinations.
- The record for every exercise should be submitted in the subsequent Practical classes and marks should be awarded for 20 for each exercise as per the above allocation.
- At the end of the semester, the average marks of all the exercises should be calculated for 20 marks and the marks awarded for attendance is to be added to arrive at the internal assessment mark for practical. (20 + 5 = 25 marks)
- The students have to submit the duly signed bonafide record notebook / file during the end semester practical examinations.
- All the marks awarded for assignments, tests and attendance should be entered in the Personal Log Book of the staff, who is handling the subject. This is applicable to both theory and practical subjects.

**Project Work and Internship:**

The students of all the branches have to do a project work in the final semester as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamil Nadu. The project work must be reviewed twice in the same semester. The project work is approved during the fifth semester by the properly constituted committee with guidelines. Proper record should be maintained for the two project reviews and preserved for one semester after the publication of end semester exams results.

**a) Internal assessment mark for Project Work & Internship:**

a)	Attendance (Award of marks same as theory pattern)	05 Marks
b)	Project Review - I	10 Marks
c)	Project Review - II	10 Marks
	<b>TOTAL</b>	<b>25 Marks</b>

**b) Allocation of Marks for Project Work & Internship in Autonomous Examination:**

a)	Demonstration / Presentation	25 Marks
b)	Project Report	25 Marks
c)	Viva-Voce	30 Marks
d)	Internship Training Report	20 Marks
	<b>TOTAL</b>	<b>100 Marks</b>

**c) Internship Report:**

The internship training for a period of two weeks shall be undergone by every student at the end of IV / V semester during vacation. The certificate shall be produced along with the internship training report for evaluation. The evaluation of internship training shall be done along with final year "Project Work" for 20 marks. The internship shall be undertaken in any Industry / Government or Private certified agencies which are in Social Sector / Government Skill Centers / Institutions / Schemes. A neatly prepared PROJECT REPORT as per the format has to be submitted by the individual student during the end semester examination.

**END SEMESTER AUTONOMOUS EXAMINATIONS  
QUESTION PAPER PATTERN FOR FIRST YEAR SUBJECTS**

*(General Question paper pattern for theory subjects, unless specified)*

**Time: 3 Hrs**

**Max. Marks: 100**

**PART – A (5 x 1 = 05 marks)**

**Sl. No. : 1 to 5**

Five questions will be asked. 1 question from each unit. Answer all the FIVE questions. Each question carries 1 mark.

**PART – B (10 x 2 = 20 marks)**

**Sl. No. : 6 to 20**

Fifteen questions will be asked. 3 questions from each unit. Answer any TEN questions. Each question carries 2 marks.

**PART – C (5 x 15 = 75 marks)**

**Sl. No. : 21 to 25**

Five questions will be asked. 1 question from each unit. Each question carries 15 marks. In each question, answer either A or B. Questions A and B have two subdivisions (i) and (ii) carrying 8 marks and 7 marks.

**END SEMESTER AUTONOMOUS EXAMINATIONS  
QUESTION PAPER PATTERN FOR SECOND AND THIRD YEAR SUBJECTS**

*(General Question paper pattern for theory subjects, unless specified)*

**Time: 3 Hrs**

**Max. Marks: 100**

**PART - A (10 x 3 = 30 marks)**

**Sl. No. : 1 to 10**

Ten questions will be asked with at least two questions from each unit. All the Ten Questions are to be answered. Each question carries 3 marks.

**PART - B (5 x 14 = 70 marks)**

**Sl. No. : 11 to 15**

Five Questions will be asked with one question from each unit in *either - or* pattern. Students

have to answer all the five questions. Each question carries 14 marks. (Based on the discretion of the question setter, he / she can ask two seven mark questions (with sub division (i) & sub division (ii)) instead of one 14 marks question, if required).

Any tables required, should be mentioned in the question paper like Steam table, IS Code Book, Steel table, Design Data Book, Mollier chart, Psychometric Chart etc.,

\*Examination will be conducted for 100 marks and will be converted to 75 marks.

### **Scheme of Examinations:**

The Scheme of examinations for subjects under R6-Scheme is given in Annexure - II.

### **Requirements to appear for Examinations:**

A candidate will be permitted to appear for the end semester Autonomous Examinations, only if he secures a minimum of overall 80% attendance in the semester concerned and pay the required examination fees in time.

### **Criteria for Pass:**

1. No candidate shall be eligible for the award of Diploma unless he has undergone the prescribed course of study successfully and pass all the subjects prescribed in the curriculum.
2. A candidate shall be declared to have passed the examination in a subject if he secures not less than 40% in theory subjects and 50% in practical subjects out of the total prescribed maximum marks including both the internal assessment and the end semester examinations marks put together, subject to the condition that he secures at least a minimum of 30 marks out of 75 marks in the theory examinations and a minimum of 35 marks out of 75 marks in the practical examinations.

### **Condonation of Attendance:**

The minimum overall percentage of attendance required for a candidate to become eligible to write the Autonomous End Semester Examination is 80%. Under extraordinary circumstances, for genuine and valid reasons including medical reasons, the Principal may condone up to a maximum of 10% shortage to a candidate, subject to the condition that he satisfies all the other requirements to appear for the Autonomous Examinations.

Under no circumstances a candidate with attendance less than 70% shall be permitted to write the Autonomous Examinations. The condonement of 10% shortage shall not be done as a routine to all candidates, but only for genuine cases; it shall not be claimed as a matter of right by all candidates.

### **Classification of successful candidates:**

Classification of candidates who will pass out the final examinations from April 2024 onwards (Joined in first year in 2021-2022) in R6-scheme is being done as specified below.

### **First Class with Superlative Distinction:**

A candidate will be declared to have passed in *First Class with Superlative Distinction*, if he secures not less than 75% of the marks in all the subjects and passes all the semesters in the first appearance itself and passes all subjects within the stipulated period of study of 3 / 2 years (3 years for regular entry / 2 years for lateral entry) without any break.

### **First Class with Distinction:**

A candidate will be declared to have passed in *First Class with Distinction*, if he secures not less than 75% of the aggregate marks in all the semesters put together and passes all the semesters except the I and II semester in the first appearance itself and passes all subjects within the stipulated period of study of 3 / 2 years (3 years for regular entry / 2 years for lateral entry) without any break.

### **First Class:**

A candidate will be declared to have passed in *First Class*, if he secures not less than 60% of the aggregate marks in all the semesters put together and passes all the subjects within the stipulated period of study 3 / 2 years (3 years for regular entry / 2 years for lateral entry) without any break.

### **Second Class:**

All other successful candidates will be declared to have passed in *Second Class*.

**Duration of a period in the Class Time Table:**

The duration of each period of instruction is 1 hour and the total period of instruction hours excluding interval and lunch break in a day should be 7 hours corresponding to 7 periods of instruction (Theory & Practical).

**ANNEXURE - I****Subjects of Study and Curriculum Outline (R6 - Scheme)****FIRST SEMESTER**

No. of weeks per semester: 16 weeks

Subject Code	Subject	Hours per Week			
		Theory	Drawing	Practical	Total
6011	Communicative English - I	5			5
6012	Engineering Mathematics - I	5			5
6013	Engineering Physics - I	5			5
6014	Engineering Chemistry - I	5			5
6015	Engineering Graphics - I		6		6
6016	Engineering Physics Practical - I			2	2
6017	Engineering Chemistry Practical - I			2	2
6018	Workshop Practical - I			3	3
6002	Computer Applications Practical			2	2
<b>TOTAL</b>		<b>20</b>	<b>6</b>	<b>9</b>	<b>35</b>

**Extra / Co-curricular Activities:**

Sub. Code	Subject	Hrs / Week
6003	Physical Education	2
6004	Library	1
6005	Value Education	1

**SECOND SEMESTER**

No. of weeks per semester: 16 weeks

Subject Code	Subject	Hours per Week			
		Theory	Drawing	Practical	Total
6021	Communicative English - II	4			4
6022	Engineering Mathematics - II	5			5
6023	Engineering Physics - II	5			5
6024	Engineering Chemistry - II	5			5
6025	Engineering Graphics - II		5		5
6026	Engineering Physics Practical - II			2	2
6027	Engineering Chemistry Practical - II			2	2
6028	Basics of Industries and Workshop Practical - II	2		3	5
6001	Communication Skill Practical			2	2
<b>TOTAL</b>		<b>21</b>	<b>5</b>	<b>9</b>	<b>35</b>

**Extra / Co-curricular Activities:**

Sub. Code	Subject	Hrs / Week
6003	Physical Education	2
6004	Library	1
6005	Value Education	1

**THIRD SEMESTER**

No. of weeks per semester: 16 weeks

SUB. CODE	SUBJECT	HOURS PER WEEK			
		THEORY	DRAWING	PRACTICAL	TOTAL
6431	C programming and Data structures	6	-	-	6
6432	Operating System	6	-	-	6

6433	Computer Hardware and Servicing	5	-	-	5
6434	C programming and Data Structures Practical	-	-	5	5
6435	Linux Practical	-	-	5	5
6436	Computer Hardware and Networking Practical	-	-	4	4
6437	E-Publishing Practical	-	-	4	4
<b>TOTAL</b>		<b>17</b>	<b>-</b>	<b>18</b>	<b>35</b>

**Extra / Co-curricular Activities:**

SUB. CODE	SUBJECT	HRS / WEEK
6003	Physical Education	2
6004	Library	1
6005	Value Education	1

**FOURTH SEMESTER**

No. of weeks per semester: 16 weeks

SUB. CODE	SUBJECT	HOURS PER WEEK			
		THEORY	DRAWING	PRACTICAL	TOTAL
6441	Python Programming	5	-	-	5
6442	Relational Database Management Systems	5	-	-	5
6443	Basics of Electrical & Electronics Engineering	5	-	-	5
6444	Software engineering	5	-	-	5
6445	Python Programming Practical	-	-	5	5
6446	Relational Database Management Systems Practical	-	-	5	5
6447	Electrical and Electronics Engineering Practical	-	-	5	5
<b>TOTAL</b>		<b>20</b>	<b>-</b>	<b>15</b>	<b>35</b>

**Extra / Co-curricular Activities:**

SUB. CODE	SUBJECT	HRS / WEEK
6003	Physical Education	2
6004	Library	1
6005	Value Education	1

**FIFTH SEMESTER**

No. of weeks per semester: 16 weeks

SUB. CODE	SUBJECT	HOURS PER WEEK			
		THEORY	DRAWING	PRACTICAL	TOTAL
6451	Object Oriented Programming with Java	6	-	-	6
6452	System Administration and Network Services	5	-	-	5
6453.1	Component Based Technology	5	-	-	5
6453.2	Artificial Intelligence and Data analytics				
6453.3	Mobile Application Development				
6454	Java Programming Practical	-	-	5	5

6455	System Administration and Network Services Practical	-	-	5	5
6456.1	Component Based Technology Practical	-	-	5	5
6456.2	Data analytics using python Practical				
6456.3	Mobile Application Development Practical				
6457	Entrepreneurship and Startup	-	-	4	4
<b>TOTAL</b>		<b>16</b>	<b>-</b>	<b>19</b>	<b>35</b>

**Extra / Co-curricular Activities:**

SUB. CODE	SUBJECT	HRS / WEEK
6003	Physical Education	2
6004	Library	1

## SIXTH SEMESTER

No. of weeks per semester: 16 weeks

SUB. CODE	SUBJECT	HOURS PER WEEK			
		THEORY	DRAWING	PRACTICAL	TOTAL
6461	Web Design and Programming	6	-	-	6
6462	Computer Networks and Cyber Security	6	-	-	6
6463.1	Multimedia Systems	5	-	-	5
6463.2	Social Networking and Ethical Hacking				
6463.3	Data science and Big Data				
6464	Web Design and Programming Practical	-	-	6	6
6465.1	Multimedia Systems Practical	-	-	6	6
6465.2	Social Networking and Ethical Hacking Practical				
6465.3	Data science and Big Data Practical				
6466	Project Work and Internship	-	-	6	6
<b>TOTAL</b>		<b>17</b>	<b>-</b>	<b>18</b>	<b>35</b>

**Extra / Co-curricular Activities:**

SUB. CODE	SUBJECT	HRS / WEEK
6003	Physical Education	2
6004	Library	1

## ANNEXURE - II SCHEME OF EXAMINATIONS

### FIRST SEMESTER

Sub. Code	Name of the Subject	Periods / Week	Periods / Semester	Scheme of Examination				Minimum for Pass
				Exam Duration in Hrs	Allocation of Marks			
					Internal	External*	Total	
6011	Communicative English - I	5	80	3	25	75	100	40
6012	Engineering Mathematics - I	5	80	3	25	75	100	40
6013	Engineering Physics - I	5	80	3	25	75	100	40



6014	Engineering Chemistry - I	5	80	3	25	75	100	40
6015	Engineering Graphics - I	6	96	3	25	75	100	40
6016	Engineering Physics Practical - I	2	32	3	25	75	100	50
6017	Engineering Chemistry Practical - I	2	32	3	25	75	100	50
6018	Workshop Practical - I	3	45	3	25	75	100	50
6002	Computer Applications Practical	2	32	3	25	75	100	50

### SECOND SEMESTER

6021	Communicative English - II	4	64	3	25	75	100	40
6022	Engineering Mathematics - II	5	80	3	25	75	100	40
6023	Engineering Physics - II	5	80	3	25	75	100	40
6024	Engineering Chemistry - II	5	80	3	25	75	100	40
6025	Engineering Graphics - II (DCE & DME) (Manual Drawing)	5	80	3	25	75	100	40
6025	Engineering Graphics – II (DEEE & DIT) (Computer Aided Drawing Practical)	5	80	3	25	75	100	50
6026	Engineering Physics Practical - II	2	32	3	25	75	100	50
6027	Engineering Chemistry Practical - II	2	32	3	25	75	100	50
6028	Basics of Industries and Workshop Practical - II	5	80	3	25	75	100	50
6001	Communication Skill Practical	2	32	3	25	75	100	50

### THIRD SEMESTER

6431	C programming and Data structures	6	96	3	25	75	100	40
6432	Operating System	6	96	3	25	75	100	40
6433	Computer Hardware and Servicing	5	80	3	25	75	100	40
6434	C programming and Data Structures Practical	5	80	3	25	75	100	50
6435	Linux Practical	5	80	3	25	75	100	50
6436	Computer Hardware and Networking Practical	4	64	3	25	75	100	50
6437	E-Publishing Practical	4	64	3	25	75	100	50

### FOURTH SEMESTER

6441	Python Programming	5	80	3	25	75	100	40
6442	Relational Database Management Systems	5	80	3	25	75	100	40
6443	Basics of Electrical & Electronics Engineering	5	80	3	25	75	100	40
6444	Software engineering	5	80	3	25	75	100	40
6445	Python Programming Practical	5	80	3	25	75	100	50
6446	Relational Database Management Systems Practical	5	80	3	25	75	100	50
6447	Electrical and Electronics Engineering Practical	5	80	3	25	75	100	50

<b>FIFTH SEMESTER</b>								
6451	Object Oriented Programming with Java	6	96	3	25	75	100	40
6452	System Administration and Network Services	5	80	3	25	75	100	40
6453.1	Component Based Technology	5	80	3	25	75	100	40
6453.2	Artificial Intelligence and Data analytics							
6453.3	Mobile Application Development							
6454	Java Programming Practical	5	80	3	25	75	100	50
6455	System Administration and Network Services Practical	5	80	3	25	75	100	50
6456.1	Component Based Technology Practical	5	80	3	25	75	100	50
6456.2	Data analytics using python Practical							
6456.3	Mobile Application Development Practical							
6457	Entrepreneurship and Startup	4	64	3	25	75	100	50
<b>SIXTH SEMESTER</b>								
6461	Web Design and Programming	6	96	3	25	75	100	40
6462	Computer Networks and Cyber Security	6	96	3	25	75	100	40
6463.1	Multimedia Systems	5	80	3	25	75	100	40
6463.2	Social Networking and Ethical Hacking							
6463.3	Data Science and Big Data							
6464	Web Design and Programming Practical	6	96	3	25	75	100	50
6465.1	Multimedia Systems Practical	6	96	3	25	75	100	50
6465.2	Social Networking and Ethical Hacking Practical							
6465.3	Data Science and Big Data Practical							
6466	Project Work and Internship	6	96	3	25	75	100	50

## **FIRST SEMESTER**

### **6011 COMMUNICATIVE ENGLISH - I**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
<b>6011 COMMUNICATIVE ENGLISH - I</b>					25	75

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
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<b>I</b>	<b>Functional Grammar and Usage</b> Parts of Speech Functional Units Use of Main Verb & Auxiliary Verb Application of Tense Forms (Simple Present, Present Continuous, Present Perfect, Simple Past, Past Continuous, Past Perfect, Simple Future, Future Continuous only) Framing Yes / No Questions Framing Wh-Questions Application of Active Voice and Passive Voice Use of Prepositions Articles	<b>17</b>
<b>II</b>	<b>Vocabulary Enrichment</b> Synonyms and Antonyms Word Conversion (selective 25 words) Collocation – Noun with Verb, Adjective with Noun (Selective 25 Collocations) Homophones (selective 25 homophones) One-word Substitution (Textual) Idiomatic expressions for Daily Life (frequently used 25 expressions) Frequently Used Phrasal verbs (selective 25 Phrasal verbs)	<b>15</b>
<b>III</b>	<b>Situational English</b> Dialogue for Day to Day Situations Short Messages for e-Communication Letter Writing for Academic Purpose (Leave Application, Requisition for Bonafide Certificate, Applying for TC) Writing the Essentials Comprehension Framing questions based on the given situation	<b>15</b>
<b>IV</b>	<b>Creative English</b> Review Writing (Book / Movie / TV Program) Visual Description Advertisement Writing Word Cloud Transforming Verbal Passage into Graphics	<b>15</b>
<b>V</b>	<b>English for Scholarly Presentation/ Fluency</b> "A Snake in the Grass" by R.K. Narayan "Of Parents and Children" by Francis Bacon "On His Blindness" by John Milton "When I Have Fears" by John Keats	<b>11</b>

**Reference Books:****Glossaries**

<https://www.engineering-dictionary.com/> <https://techterms.com/definition/>  
<http://dictionary.tamilcube.com/> [https://www.lexilogos.com/english/tamil\\_dictionary.htm](https://www.lexilogos.com/english/tamil_dictionary.htm)

**Grammar**

1. Just Enough English Grammar Illustrated, Gabriele Stobbe, McGraw-Hill Osborne Media, 2008
2. Visual Guide to Grammar and Punctuation, DK Publishing, 2017
3. English Grammar in Use, Raymond Murphy, Cambridge University Press, 2019
4. Intermediate English Grammar, Raymond Murphy, Cambridge University Press, 2<sup>nd</sup> Edition.
5. Essential English Grammar, Raymond Murphy, Cambridge University Press, New edition.

**Enrichment of Study**

1. Enrich Your Vocabulary: Vocabulary for General, Placement & Competitive Exams by Edin Brow

**Motivation**

1. An Autobiography; Or, The Story of My Experiments with Truth, Mahatma Gandhi, Penguin Books, 2001
2. You Can Win, Shiv Khera, New Dawn Press, 2004
3. Chicken Soup for the Soul, Jack Canfield, Mark Victor Hansen, 2001
4. How to Win Friends and Influence People by Dale Carnegie

**QUESTION PAPER PATTERN****Model Examination / End semester Examination**

Time: 3 Hrs.

Max. Marks: 100

Sl. No	Questions	Portions	Marks
1	Answer any TEN out of 16 questions	Unit I & II - Grammar items	10 x 4 = 40
2	Answer any FOUR out of 6 questions	Unit III - Composition items	4 x 5 = 20
3	Answer any FOUR out of 5 questions	Unit IV - Composition items	4 x 5 = 20
4	Answer any FOUR out of 5 questions	Unit V - Prose & Poetry	4 x 5 = 20
<b>TOTAL</b>			<b>100</b>

## 6012 ENGINEERING MATHEMATICS - I

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
<b>6012 ENGINEERING MATHEMATICS – I</b>	Hrs / Week	Hrs / Sem	Marks			Duration
	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	75	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
<b>I</b>	<b>ALGEBRA</b>	
	<b>1.1 MATRICES AND DETERMINANTS</b> <b>MATRICES:</b> Definition, concept and types of matrices. <b>DETERMINANTS:</b> Determinant of a square matrix - 2 <sup>nd</sup> and 3 <sup>rd</sup> order determinants - singular and non-singular matrices - simple problems.	<b>4</b>
	<b>1.2 APPLICATIONS OF MATRICES AND DETERMINANTS</b> Co-factor, Adjoint of matrix, Inverse of matrix and rank of a matrix by determinant method - simple problems. Solution of simultaneous equations using Cramer's rule - simple problems.	<b>5</b>
<b>II</b>	<b>1.3 BINOMIAL THEOREM</b> Introduction - Factorial, Permutation and Combinations - Values of nPr and nCr (Results only - not for examination). Statement of Binomial theorem for positive integral index - Expansion of Binomial - Finding general term - Middle term - Coefficient of x <sup>n</sup> and Term independent of x - Binomial theorem for rational index up to 3. Applications of Binomial theorem - simple problems.	<b>5</b>
	<b>COMPLEX NUMBERS</b>	
	<b>2.1 ALGEBRA OF COMPLEX NUMBERS</b> Introduction - Complex numbers - Conjugates - Algebra of complex numbers (without geometrical proof), Properties of complex conjugates - Modulus and amplitude - Polar and Euler form of a complex number - simple problems. Argand diagram - Collinear points, four points forming square, rectangle, rhombus and parallelogram only - simple problems.	<b>5</b>
<b>III</b>	<b>2.2 DE MOIVRE'S THEOREM</b> De Moivre's Theorem (statement and applications) - related simple problems.	<b>5</b>
	<b>2.3 ROOTS OF COMPLEX NUMBERS</b> Finding the n <sup>th</sup> roots of unity - solving the equations of the form $X^n \pm 1 = 0$ , where $n \leq 7$ - simple problems.	<b>5</b>
	<b>TRIGONOMETRY</b>	
<b>III</b>	<b>3.1 TRIGONOMETRIC IDENTITIES</b> Trigonometric ratios of sum and difference of two angles - Multiple and sub-multiple angles - Functions of 3A angles - simple problems.	<b>7</b>
	<b>3.2 INVERSE TRIGONOMETRIC FUNCTIONS</b> Sum and product identities - Inverse trigonometric functions - Principal value - Properties of inverse trigonometric functions - simple problems.	<b>8</b>
<b>IV</b>	<b>DIFFERENTIAL CALCULUS - I</b>	
	<b>4.1 LIMITS</b>	<b>5</b>

	<p>Definition of limits - Problems using the following results</p> <p>(i) <math>\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}</math> (ii) <math>\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1</math></p> <p>(iii) <math>\lim_{\theta \rightarrow 0} \frac{\tan \theta}{\theta} = 1</math> (<math>\theta</math> in radians) (Results only)</p> <p><b>4.2 DIFFERENTIATION</b> The derivative of a function - Differentiation of constant, <math>X^n</math>, <math>\sin x</math>, <math>\cos x</math>, <math>\tan x</math>, <math>\sec x</math>, <math>\operatorname{cosec} x</math>, <math>\cot x</math>, <math>\log x</math>, <math>e^x</math>, <math>a^x</math>, <math>\sin^{-1} x</math>, <math>\cos^{-1} x</math>, <math>\tan^{-1} x</math>, <math>\cot^{-1} x</math>, <math>\sec^{-1} x</math> and <math>\operatorname{cosec}^{-1} x</math> (Formulae only) - Differentiation rules: <math>u \pm v</math>, <math>uv</math>, <math>uvw</math>, <math>u/v</math> - simple problems.</p> <p><b>4.3 DIFFERENTIATION METHODS</b> Chain rule - Differentiation of Implicit functions - Differentiation of parametric functions - simple problems.</p>	5
	<p><b>DIFFERENTIAL CALCULUS - II</b></p> <p><b>5.1 SUCCESSIVE DIFFERENTIATION</b> Successive differentiation up to second order (parametric form not included). Definition of differential equation, order and degree, formation of differential equation - simple problems.</p> <p><b>5.2 PARTIAL DIFFERENTIATION</b> Definition - Partial differentiation of two variables up to second order only - simple problems.</p>	7
V		7

**Reference Books:**

1. Higher Secondary +1 Mathematics volume I & II. Tamil Nadu Text Book Corporation.
2. Higher Secondary +2 Mathematics Volume I & II. Tamil Nadu Text Book Corporation.
3. Engineering Mathematics V. Sundaram, R. Balasubramanian.
4. Engineering Mathematics - I C.B.Gupta ,A.K.Malik, New age international Pub., 1<sup>st</sup>ed, - 2008.
5. Differential Calculus S. Balachandra Rao, CK Shantha New age Publishers
6. Probability Theory and Stochastic Process B.Prabhakara Rao, TSR Murthy, BS Publishers.

**QUESTION PAPER PATTERN: General Pattern****6013 ENGINEERING PHYSICS - I**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6013 ENGINEERING PHYSICS - I	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
I	<p><b>SI UNITS AND STATICS</b></p> <p><b>1.1 UNITS AND MEASUREMENTS</b> Unit - Definition - Fundamental Quantities - Definition - Seven fundamental quantities - SI units and symbols for the seven fundamental quantities - Dimensional formula for length, mass and time - Supplementary quantities - Plane angle and Solid angle - SI units and symbols for the supplementary quantities - Derived quantities - Definition - SI units, symbols and derivation of dimensional formula for the derived quantities (area, volume, density, velocity, momentum, acceleration, force, impulse, work or energy and power) - Uses of Dimensional formula - Different types of measurement systems - Conventions to be followed while writing SI units - Multiples and sub-multiples of units and their prefixes - Unit conversions (Horse power to Watt and Calorie to Joule) - Applications of the method of dimensional analysis.</p> <p><b>1.2 STATICS</b> Scalar and vector quantities - Definition and examples - Concurrent forces</p>	6

	<p>and coplanar forces - Definition - Resolution of a vector into two perpendicular components - Resultant and equilibrant - Definition - Parallelogram law of forces - Statement - Expressions for magnitude and direction of the resultant of two forces acting at a point with an acute angle between them - Lami's theorem - Statement and explanation - Experimental verification of parallelogram law of forces and Lami's theorem - Simple problems based on expressions for magnitude and direction of resultant - Moment of a force - Clockwise and anti-clockwise moments - Principle of moments - Couple - Torque acting due to a couple - Experimental determination of mass of the given body using principle of moments.</p>	<b>9</b>
<b>II</b>	<p><b>DYNAMICS - I</b></p> <p><b>2.1 STRAIGHT LINE MOTION</b> Introduction - Distance - Displacement - Speed - Velocity - Acceleration - Acceleration due to gravity - Definitions - Difference between mass and weight - Newton's laws of motion - Fundamental Equations of motion for objects - in horizontal motion - Falling freely - Thrown vertically upwards.</p> <p><b>2.2 PROJECTILE MOTION</b> Projectile motion - Angle of projection - Trajectory - Maximum height - Time of flight - Horizontal range - Definitions - Expressions for maximum height, time of flight and horizontal range - Condition for getting the maximum range of the projectile - Path of the projectile is a Parabola - Simple problems based on expressions for maximum height, time of flight and horizontal range - Examples of projectile motion.</p> <p><b>2.3 CIRCULAR MOTION</b> Circular motion - Angular velocity - Period - Frequency - Definitions - Relation between linear velocity and angular velocity - Introduction to Degrees and radians - Relation between angular velocity, period and frequency - Normal acceleration - Centripetal force - Centrifugal force - Definitions - Expressions for normal acceleration and centripetal force - Banking of curved paths - Angle of banking - Definition - Expression for the angle of banking of a curved path - Simple harmonic motion - Amplitude, frequency and period - Definitions - Simple problems based on the expressions for centripetal force and angle of banking - Applications of centripetal force and centrifugal force.</p>	<b>3</b>  <b>5</b>  <b>7</b>
<b>III</b>	<p><b>DYNAMICS - II</b></p> <p><b>3.1 ROTATIONAL MOTION OF RIGID BODIES</b> Rigid body - Definition - Moment of inertia of a particle about an axis - Moment of inertia of a rigid body about an axis - Radius of gyration - Definition - Expression for the kinetic energy of a rotating rigid body about an axis - Angular momentum - Definition - Expression for the angular momentum of a rotating rigid body about an axis - Law of conservation of angular momentum - Examples.</p> <p><b>3.2 GRAVITATION</b> Newton's laws of gravitation - Acceleration due to gravity on the surface of earth - Expression for variation of acceleration due to gravity with altitude.</p> <p><b>3.3 SATELLITES</b> Satellites - Natural and artificial - Escape velocity and orbital velocity - Definitions - Expression for escape velocity and orbital velocity - Polar and Geostationary satellites - Uses of artificial satellites - Simple problems based on escape velocity and orbital velocity.</p>	<b>5</b>  <b>4</b>  <b>5</b>
<b>IV</b>	<p><b>PROPERTIES OF MATTER</b></p> <p><b>4.1 ELASTICITY</b> Elastic and plastic bodies - Definition - Stress - Strain - Definitions - Hooke's law - Statement - Types of strain - Elastic and plastic limit - Young's modulus - Bulk modulus - Rigidity modulus - Definitions - Uniform and non-uniform bending of beams - Experimental determination of the Young's modulus of the material of a beam by uniform bending method - Poisson's ratio - Simple problems based on stress, strain and Young's modulus - Applications of elasticity.</p> <p><b>4.2 FLUID STATICS</b> Introduction - Pressure - Definition - Pressure due to fluid column at rest -</p>	<b>4</b>

	<p>Pascal's law and its applications - Hydraulic lift and hydraulic brake - Buoyancy - Archimede's Principle - Law of floatation.</p> <p><b>4.3 VISCOSITY</b> Viscous force - Viscosity - Coefficient of viscosity - Definitions - SI unit and dimensional formula for coefficient of viscosity - Streamline flow - Turbulent flow - Critical velocity - Reynolds number - Definition - Experimental comparison of coefficient of viscosity of two low viscous liquids - Terminal velocity - Definition - Experimental determination of coefficient of viscosity of a highly viscous liquid by Stoke's method - Practical applications of viscosity - Practical applications of Stoke's law.</p> <p><b>4.4 SURFACE TENSION</b> Surface tension - Angle of contact - Definitions - Expression for surface tension of a liquid by capillary rise method - Experimental determination of surface tension of water by capillary rise method - Practical applications of capillarity - Simple problems based on expression for surface tension - Applications of surface tension.</p>	3  4  4
<b>V</b>	<p><b>SOUND AND MAGNETISM</b></p> <p><b>5.1 SOUND</b> Wave motion - Introduction and definition - Audible range - Infrasonic - Ultrasonics - Progressive waves, longitudinal and transverse waves - Examples - Amplitude, Wave length, period and frequency of a wave - Definitions - Relation between wavelength, frequency and velocity of a wave - Stationary or standing waves - Vibrations - Free vibrations, forced vibrations and resonance - Definitions and examples - Laws of transverse vibration of a stretched string - Sonometer - Experimental determination of frequency of a tuning fork - Simple problems based on expression for frequency of vibration - Doppler effect - Definition and applications - Ultrasonic and its uses - SONAR.</p> <p><b>5.2 ACOUSTICS OF BUILDINGS</b> Acoustics of buildings - Echo - Reverberation - Reverberation time - Sabine's formula for reverberation time - Coefficient of sound absorption - Noise pollution.</p> <p><b>5.3 MAGNETISM</b> Pole strength - Definitions - Magnetic moment, intensity of magnetisation, magnetising field intensity, magnetic induction, Permeability, hysteresis, saturation, retentivity and coercivity - Definitions - Method of drawing hysteresis loop of a specimen using a solenoid - Uses of hysteresis loop - Simple problems based on intensity of magnetization - Types of magnetic materials and their applications.</p>	6  3  5

**Reference Books:**

1. Fundamentals of Physics - Halliday & Resnick - Wiley India Pvt. Ltd. - Sixth Edition.
2. Physics for Higher Secondary - First & Second year - Volume I & II - Tamilnadu Textbook and Educational Services Corporation, 2018.
3. Engineering Physics - B.L.Theraja - S. Chand & Company Ltd. - Fourth Edition.
4. A text book of sound - R.L. Saighal - S. Chand Publishing - 2005.
5. A textbook of Applied Mechanics - R. S. Khurmi - S. Chand & Company Ltd. - Twelfth Edition.

**QUESTION PAPER PATTERN: General Pattern****6014 ENGINEERING CHEMISTRY - I**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6014 ENGINEERING CHEMISTRY - I	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
I	<b>TECHNOLOGY OF WATER AND ACIDS AND BASES</b> <b>1.1 TECHNOLOGY OF WATER</b> Sources of water - Reasons for depletion of underground water - Rainwater harvesting (basic concepts) - Advantages - Hard water and soft water - Hardness of water - Carbonate and non-carbonate hardness - Disadvantages of hard water - Methods of expressing hardness - mg/lit and ppm - Simple problems - Softening of hard water - Ion-exchange method and Reverse osmosis method - Municipal water supply - Purification of drinking water (sedimentation, filtration and sterilization) - Disadvantages of using hard water in boilers - Scale formation - Corrosion of boiler metal - Caustic Embrittlement - Priming and foaming.	9
	<b>1.2 ACIDS AND BASES</b> Theories of acids and bases - Arrhenius theory - Lowry-Bronsted theory - Lewis theory - Advantages of Lewis theory - pH and pOH - Definition - Numerical problems - Indicator - Definition - Buffer solution - Definition - Types of buffer solution with examples - Application of pH in industries.	6
II	<b>ATOMIC STRUCTURE AND CHEMICAL BONDING, NUCLEAR CHEMISTRY</b> <b>2.1 ATOMIC STRUCTURE AND CHEMICAL BONDING</b> Fundamental particles - Proton - Electron - Neutron - Atomic number - Mass number - Extra nuclear part - Filling up of electrons - Aufbau principle - s-p-d-f orbital's - Electronic configuration - Definition of atomic mass, molecular mass, equivalent mass, valency (definitions only) - Octet rule - Electrovalent bond - Sodium chloride formation - Covalent bond - Formation of ammonia.	6
	<b>2.2 NUCLEAR CHEMISTRY</b> Natural radio activity - Definition - Alpha, beta, gamma rays - Comparison of alpha, beta, gamma particles - Atomic theory - Isotopes, Isobars and Isotones - Definition - Examples - Radioactive decay - Alpha and beta decay with example - Group displacement law - Half life period - Definition - Simple problems - Artificial radioactivity - Definition - Example - Nuclear fission and Nuclear fusion - Definition - Fission of U235 - Fusion reaction in the Sun - Nuclear reactor - Definition - Types of nuclear reactors - Components nuclear reactor - Reactor core, reflector, pressure vessel, shielding, heat exchanger and turbine - Application of radioactive isotopes.	8
III	<b>SOLUTION, COLLOIDS AND CATALYSIS</b> <b>3.1 SOLUTION</b> Definition - Methods of expressing concentration of solutions - Percentage by mass, normality, molarity, molality, and mole fraction - Simple problems.	4
	<b>3.2 COLLOIDS</b> True solution and colloidal solution - Definition - Differences - Types of Colloids - Lyophilic and lyophobic colloids - Differences - Properties - Tyndall effect, Brownian movement, Electrophoresis and Coagulation - Industrial applications of colloids - Smoke precipitation by Cottrell's method - Purification of water - Cleansing action of soap - Tanning of leather and sewage disposal.	6
	<b>3.3 CATALYSIS</b> Catalyst - Definition - Types of catalyst - Positive catalyst - Negative catalyst - Catalysis - Definition - Types of catalysis - Homogeneous and heterogeneous - Promoter - Catalyst poison - Definition - Characteristics of a catalyst - Industrial applications of catalysts.	4
IV	<b>ELECTROCHEMISTRY, ELECTROCHEMICAL CELL AND ENERGY SOURCES</b> <b>4.1 ELECTROCHEMISTRY</b> Electrolyte - Definition - Strong and weak electrolytes – non-electrolytes - Examples - Electrolysis - Definition - Mechanism - Industrial application of electrolysis - Electroplating - Chrome plating - Preparation of surface process - Factors affecting the stability of the coating - Electroless plating - Definition - Advantages of electroless plating over electroplating - Applications of electroless plating.	5





	<p><b>1.1 DRAWING OFFICE PRACTICE</b>  Importance of engineering drawing as a graphic communication - drawing practice as per BIS code - drawing instruments: drawing board, mini drafter, compass, divider, protractor, drawing sheets, drawing pencils, set squares etc., - title block - layout and folding of drawing sheets.  Lettering and numbering as per BIS - importance of legible lettering and numbering - single stroke letters - upper case and lower case letters - slanting / inclined letters - general procedures for lettering and numbering - height of letters - guidelines - practices.  Scales - full size scale, reducing scale and enlarging scales (Description only).</p> <p><b>1.2 DIMENSIONING</b>  Dimensioning - need for dimensioning - dimensioning terms and notations as per BIS - dimension line, extension line and leader line - dimensioning systems - methods of placement of dimensions - uni-directional and aligned systems - important dimensioning rules - dimensioning of common features - diameters, radii, holes, chamfers - addition of letters and symbols - parallel, chain and progressive dimensioning - practice of dimensioning the given drawing as per BIS code (one view of the object).</p>	<p><b>6</b></p> <p><b>13</b></p>
<b>II</b>	<p><b>GEOMETRIC CONSTRUCTIONS AND CONSTRUCTION OF CONICS</b></p> <p><b>2.1 GEOMETRIC CONSTRUCTIONS</b>  Bisect a straight line - bisect an arc - bisect an angle - divide a straight line into any number of equal parts - divide the circle into number of equal divisions - construct an arc touching two lines at any angle - construct an arc touching two arcs.</p> <p><b>2.2 CONSTRUCTION OF CONICS</b>  Conic sections - definition of locus, focus, directrix, axis, vertex and eccentricity - practical applications of ellipse, parabola and hyperbola.  Ellipse: Construction of ellipse by concentric circle method, rectangular method when major and minor axis are given and eccentricity method when focus and directrix are given - exercises in practical applications.  Parabola: Construction of parabola by rectangular method, parallelogram method when major and minor axis are given and eccentricity method when focus and directrix are given - exercises in practical applications.  Hyperbola: Construction of hyperbola by eccentricity method when focus and directrix are given - exercises in practical applications.</p>	<p><b>6</b></p> <p><b>13</b></p>
<b>III</b>	<p><b>PROJECTION OF POINTS &amp; STRAIGHT LINES AND CONSTRUCTION OF SPECIAL CURVES</b></p> <p><b>3.1 PROJECTION OF POINTS AND STRAIGHT LINES</b>  Projection of points - position of a point on four quadrants and on the reference planes - system of notation - Place a point on four quadrants with different distances - exercises.  Projection of straight lines - line in the first quadrant and on the reference planes - parallel to one plane and perpendicular to other plane - inclined to one plane and parallel to the other plane - inclined to both the planes - simple exercises.</p> <p><b>3.2 CONSTRUCTION OF SPECIAL CURVES</b>  Definition and construction of cycloid - epicycloid - hypocycloid - involute of a circle - Archimedean spiral for one revolution - helix - practical applications - exercises.</p>	<p><b>11</b></p> <p><b>8</b></p>
<b>IV</b>	<p><b>ORTHOGRAPHIC PROJECTIONS</b></p> <p><b>FIRST &amp; THIRD ANGLE PROJECTIONS : SIMPLE COMPONENTS</b>  Introduction - projection terms - orthographic projection - planes of projection - principal orthographic views - designation of views - four quadrants - first angle projection - third angle projection - symbols and arrangement of views for first angle and third angle projections - comparison - Simple exercises in first angle</p>	<p><b>11</b></p>

projection with minimum two views of simple components (Without curves and circles). <b>FIRST ANGLE PROJECTIONS ONLY: ENGINEERING COMPONENTS</b> Draw the projections of the simple engineering components using first angle projection - exercises in drawing orthographic views-three views - front view, top view and right / left side views. (For Exam any two views can be asked.)	<b>21</b>
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**Reference Books:**

1. Bhatt N.D, "Engineering Drawing", Charotar Publishing House Pvt. Ltd.
2. Gill P.S, "Engineering drawing", S.K.Kataria & Sons.
3. Gopalakrishna.K.R., "Engineering Drawing", (Vol 1 & 2 combined), Subhas Publications.
4. Venugopal.K, Prabhu Raja V, "Engineering Graphics", New Age International Publishers.
5. Natarajan KV "A Text Book of Engineering Drawing and Graphics" Publisher: N Dhanalakshmi.

**QUESTION PAPER PATTERN****PART – A (4 x 5 = 20)**

Note: Five questions will be asked (Sl. No: 1 to 5). Answer any four questions.  
Each question carries five marks.  
Minimum one question should be asked from each unit first chapter.  
(Chapters: 1.1, 2.1, 3.1, 4.1)

**PART – B (4 x 20 = 80)**

Note: Six questions will be asked (Sl. No: 6 to 11). Answer any four questions.  
Each question carries twenty marks.  
Minimum one question should be asked from each unit second chapter. (Chapters: 1.2, 2.2, 3.2, 4.2)

**Internal Assessment Marks:**

Class work assignment drawings	10
Average of two continuous assessment tests	05
Model examination	05
Attendance	05
<b>Total</b>	<b>25</b>

**6016 ENGINEERING PHYSICS PRACTICAL - I**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
			Internal Assessment	External Exam*	Total	
<b>6016 ENGINEERING PHYSICS PRACTICAL - I</b>	2 Hrs	32 Hrs	25	75	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**LIST OF EXPERIMENTS WITH OBJECTIVES:**

1. SCREW GAUGE - To measure the thickness of the given irregular glass plate using screw gauge and to determine the area of the glass plate using a graph sheet and to calculate the volume of the glass plate.
2. VERNIER CALIPER - To measure the length, inner and outer diameters of the given hollow cylinder using Vernier caliper and to calculate the volume of the hollow cylinder.
3. VERIFICATION OF PARALLELOGRAM LAW OF FORCES - To verify Parallelogram law of forces using Concurrent forces apparatus.
4. VERIFICATION OF LAMI'S THEOREM - To verify Lami's theorem using Concurrent forces apparatus.
5. SIMPLE PENDULUM - To determine the acceleration due to gravity using simple pendulum apparatus.

6. TORSION PENDULUM - To determine the moment of inertia of the disc and rigidity modulus of the given wire using torsion pendulum.
7. STOKE'S METHOD - To determine the coefficient of viscosity of high viscous liquid by Stokes method.
8. SURFACE TENSION - To determine the surface tension of water by capillary rise method.
9. DEFLECTION MAGNETOMETER - To compare the magnetic moments of the given two bar magnets using deflection magnetometer in tan A position by equal distance method.
10. SONOMETER - To determine the frequency of the given tuning fork using sonometer.

#### QUESTION PAPER PATTERN

Answer any one of the above experiment chosen by random method. The marks will be awarded as per the scheme of valuation given below.

#### SCHEME OF VALUATION

S. No	Category	Marks
1	Formula and diagram	20
2	Tabulation	10
3	Observation	40
4	Calculation	15
5	Result	10
6	Viva voce	05
Total		<b>100</b>

### 6017 ENGINEERING CHEMISTRY PRACTICAL - I

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
<b>6017 ENGINEERING CHEMISTRY PRACTICAL - I</b>	2 Hrs	32 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

#### VOLUMETRIC ANALYSIS EXPERIMENTS:

##### Acidimetry and Alkalimetry:

1. Estimation of sulphuric acid using a standard solution of hydrochloric acid and sodium hydroxide as link solution - phenolphthalein indicator.
2. Estimation of sodium hydroxide using standard solution of sodium carbonate using sulphuric acid as a link solution - methyl orange indicator.
3. Comparison of strength of two hydrochloric acid solutions using a link solution of sodium hydroxide - phenolphthalein indicator.
4. Comparison of strength of two sodium hydroxide solutions using Oxalic acid link solution phenolphthalein indicator.

##### Permanganometry:

5. Estimation of Mohr's salt solution using standard solution of ferrous sulphate and link solution of potassium permanganate.
6. Estimation of ferrous sulphate using standard solution of Mohr's salt solution and link solution of potassium permanganate.
7. Comparison of two Mohr's salt solutions with a link solution of potassium permanganate.
8. Comparison of two potassium permanganate solutions with a link solution of ferrous sulphate.

#### QUESTION PAPER PATTERN

Answer any one of the above experiment chosen by random method. The marks will be awarded as per the scheme of valuation given below.

#### SCHEME OF VALUATION

Sl. No	Category	Marks
1	Short procedure	10
2	Titration I	35
3	Titration II	35
4	Calculations (3 x 5)	15
5	Viva Voce	05
Total		100

Titration value accuracy for Titration I and II:

Accuracy	Marks
±0.2ml	35
Above ±0.2 ml to ±0.4 ml	30
Above ±0.4 ml to ±0.6 ml	25
Above ±0.6 ml	10

### 6018 WORKSHOP PRACTICAL - I

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			
6018EI WORKSHOP PRACTICAL - I	3 Hrs	48 Hrs	Internal Assessment	External Exam*	Total	Duration 3 Hrs
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

#### I. FITTING

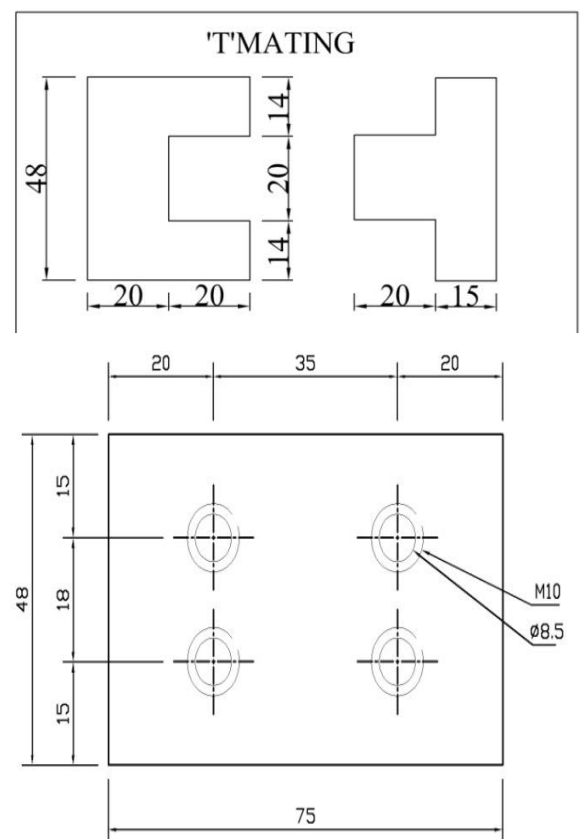
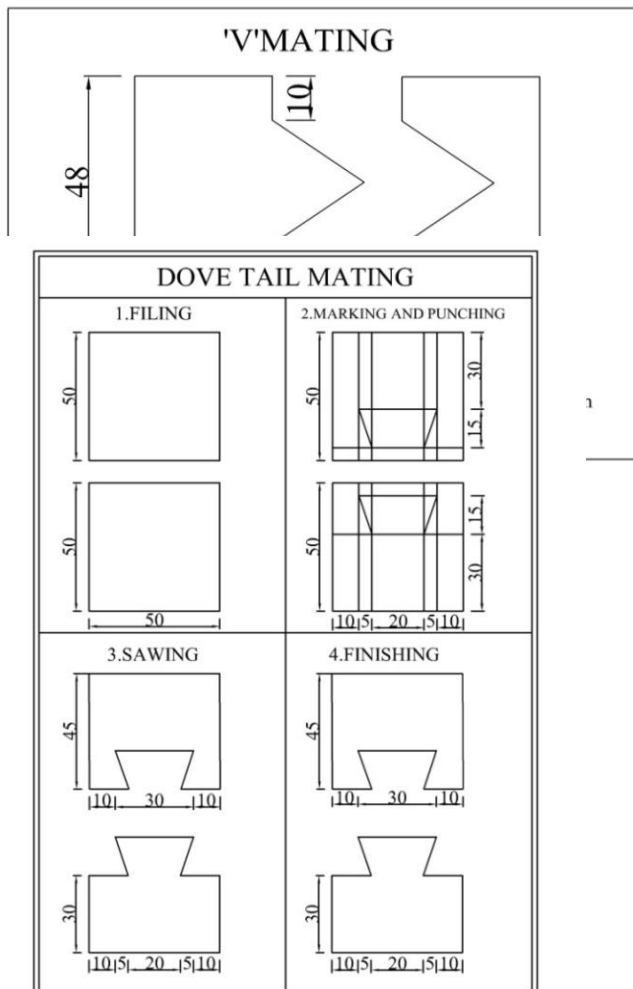
Introduction of fitting tools

04 Hrs

#### Exercises:

12 Hrs

- 'V' Mating
- 'T' Mating
- Dovetail Mating
- Drilling & Tapping



#### DRILLING AND TAPPING

All dimensions are in 'mm'

Material :80x50x3 mm M.S Flate, Tolerance: ± 0.1mm

Material: 80x50x10mm MS Flat, Tolerance:  $\pm 0.1$  mm

**Raw material:** Use 3 mm thick MS flat for filing and 10 mm MS flat for drilling & tapping.

## II. PLUMBING

Introduction of plumbing tools

04 Hrs

### Exercises:

12 Hrs

1. Cutting, bending and external threading of GI pipes using Die.
2. Install a sink and tap using different PVC pipe accessories such as bend, tee, socket and valve.
3. Install a washbasin and tap using different PVC pipe accessories such as bend, tee, socket and valve.
4. To Repair and replace all kinds of leaks.

## III. CARPENTRY

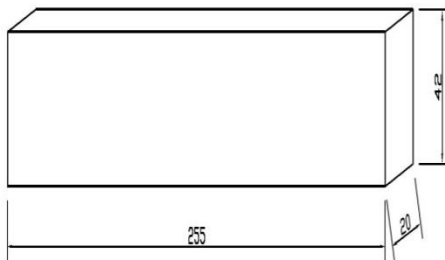
Introduction of carpentry tools

04 Hrs

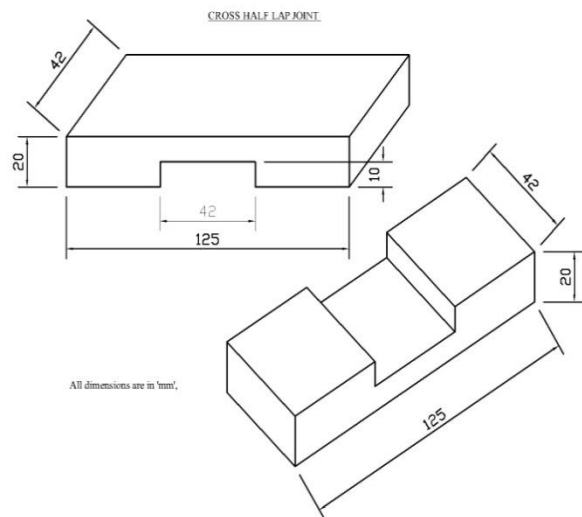
### Exercises:

12 Hrs

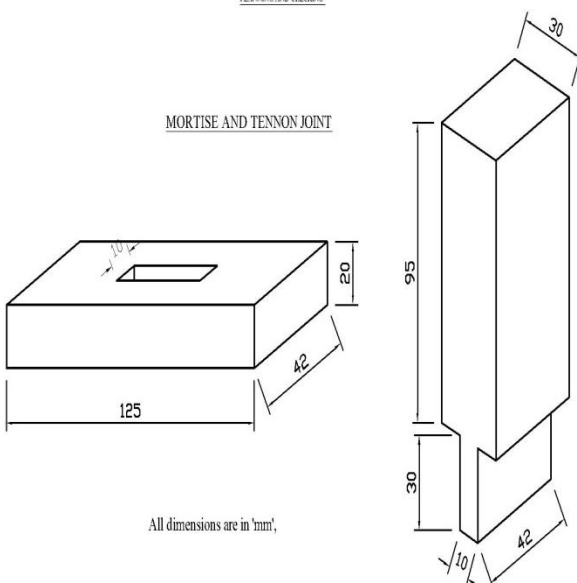
1. Planning & check up
2. Cross lap joint
3. Mortise and Tenon joint
4. Dovetail joint



PLANNING AND CHECKING

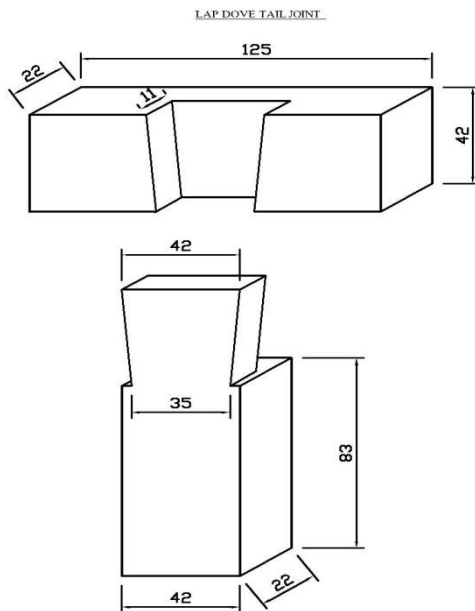


All dimensions are in 'mm'.



MORTISE AND TENNON JOINT

All dimensions are in 'mm'.



**QUESTION PAPER PATTERN**

Fitting Exercise	50 marks
Plumbing or Carpentry (Any one) Exercise	45 marks
Viva voce	05 marks
<b>Total</b>	<b>100 marks</b>

**6002 COMPUTER APPLICATIONS PRACTICAL**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6002 COMPUTER APPLICATIONS PRACTICAL	2 Hrs	32 Hrs	Internal Assessment	External Exam*	Total	
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
I	<b>Basics of Computer:</b> Computer basics - Hardware & software - General understanding of various computer hardware components - CPU - Memory - Display - Keyboard - Mouse - HDD & Other peripheral devices - Types of software - Application software & system software.	5
II	<b>Word Processing:</b> Creating new document - Opening an existing document - Edit & save a document - Typing a text - Deleting a text - Inserting a text - Finding a text - Replacing a text - Copying & moving a text - Selecting font & font size - Justifying texts - Bold - Italic - Underline - Strike - Double strike - Coloring text - Spell check - Ruler - Formatting page - Line spacing - Margins - Page size - Page border - Page color - Page columns - Watermark - Page break - Section break - Portrait - Landscape - Inserting symbols, equations & shapes - Text Box - Word art - Hyperlink - Inserting pictures - Picture arrangement - Align objects - Bullets & numbering - Working with tables - Header & footer - Table of contents - Inserting page number - Changing character width & line spacing - Printing the document - Print preview - Shortcuts for various activities in word - Exercises.	9
III	<b>Spread sheet:</b> Creating a new worksheet - Opening an existing worksheet - Editing and saving a worksheet - Creating, renaming and deleting worksheets in a workbook - Types of data like numeric, text etc. - Entering in a cell - Manipulation of a cell, row and column (deleting, inserting, finding, replacing,	9

	copying and moving) - Justifying in a cell, Merging cells and columns - Addition, subtraction and using formula - Selecting font and font sizes - Using and manipulating tables, inserting / deleting of rows and columns – Sorting columns- Using header and footer, Inserting page number - Border and shading of cells, rows and columns - Formatting page, margins, page size, portrait and landscape - Selecting area for printing - Printing of a worksheet and workbooks - Using print preview - Copy / moving text between two different worksheets and workbooks - Using chart wizard - Creation of different types of charts - Protect sheet using password - Shortcuts for various activities in spreadsheet - Exercises.	
<b>IV</b>	<b>Presentations:</b> Creating new presentations - Opening presentations - Saving presentation - Inserting new slides - Slide layout - Slide design - Presentation view - Adding text - Font formatting - Paragraph formatting - Inserting clipart & pictures - Inserting and manipulating smart art - Running a slide show - Insert slide number - Slide header & footer - Applying slide animation - Custom animation - Inserting shapes - Insert Video & sound - Insert action - Hyperlinks - Charts - Tables - Page setup - Print preview - Printing - Shortcuts of various activities in presentations - Exercises.	<b>9</b>

Theory & Instruction Classes	08 Hours
Practical Experiments	20 Hours
Revision / Repetition	04 Hours
<b>Total</b>	<b>32 Hours</b>

## EXERCISES

### EXERCISE 1 (WORD PROCESSING)

Prepare a report from the given printed document of minimum 250 words. (Use text formatting tools, header & footer, page number, line spacing, font & images)

- **Page Setup:** Set Margin: Left - 1.5, Right - 1.5, Top - 1.5 & Bottom - 1.5 / Orientation: Portrait / Paper Size: A4 / No. of Columns: 2.
- **Page Background Settings:** Watermark / Page Color / Page Borders
- **Text & Paragraph Settings:** Title: Font size: 16 - Centered - Bold - Suitable font - Heading: Font size: 14 - Left aligned - Underlined - Set the suitable font face - Body text: Font size: 12 - Justified - 1.5 Line spacing - Set the suitable font face.
- **Header & Footer:** Header - Seminar name, Name of the student, Reg. No. & Branch Footer - Page No., Date and Time
- **Insert:** Picture / Clipart / Shapes / Table.
- **Minimum No. of words:** 250 words

### EXERCISE 2 (WORD PROCESSING)

Create a resume for placement from the given printed template with your personal details. Publish a copy of the resume as PDF.

- **Page Setup:** Margin: Left - 0.5, Right - 0.5, Top - 0.5 & Bottom - 0.5 / Orientation: Portrait / Paper size: A4 / No. of columns: As per resume format.
- **Page Borders:** Insert page border if required.
- **Font & Paragraph:** Heading: Font size: 12 - Bold - Underlined - Set the suitable font - Face body text - Font size: 12 - Justified - 1 Line spacing - Set the suitable font - Insert bullets & numberings wherever required.
- **Insert:** Photo for your resume / tables.
- **Save as PDF:** Publish a copy of the resume as PDF using any PDF converting tools.

### EXERCISE 3 (WORD PROCESSING)

Create a standard covering letter and use mail merge to generate the customized letters for applying to a job in various organizations. Also, create a database and generate labels for the applying organizations.

- **Page Setup:** Margin: Left - 1.5, Right - 1.5, Top - 1.5 & Bottom - 1.5 / Orientation: Portrait / Paper Size: A4
- **Page Background:** Add page border for the letter.
- **Font & Paragraph:** Title: Font size: 16 - Centered - Bold - Suitable font - Heading: Font size: 14 - Left Aligned - Underlined - Set the suitable font face , Body text: Font size: 12 - Justified -



1.5 Line spacing - Set the suitable font face.

- **Mailings:** Select recipients and add a new List of HR database. Start mail merge through step by step mail merge wizard

#### **EXERCISE 4 (SPREAD SHEET)**

Create a worksheet for the given relational data (minimum ten records) and show the data in the Line chart, Bar chart and Pie chart.

- **10 Records:** Add text to the spreadsheet to the various fields require to analyze the data in chart.
- **Font & Alignment:** Font face - Font size - Font color.
- **Formulae:** Use formulae for the selected data for calculation.
- **Insert:** Charts - Line chart, Bar chart & Pie chart.

#### **EXERCISE 5 (SPREAD SHEET)**

Create a worksheet for the given data with various functions like sum, average, count, min, max & logical functions [IF, AND].

- **Data:** Create a worksheet and insert the various records to the cells.
- **Formatting:** Set the font using font name, font size and with various alignment tools.
- **Formulas and Functions:** Use some functions like sum, average, count, min, max and logical functions. [IF, AND]

#### **EXERCISE 6 (SPREAD SHEET)**

Create a worksheet for given data & analysis the data with various filters & conditional formatting

- **Data**
- **Formatting** Text: Font Face - Font Size - Font Color - Alignment
- **Functions**
- **Conditional Formatting**
- **Filters**

#### **EXERCISE 7 (PRESENTATION)**

Create a presentation of minimum 10 slides from engineering related topic.

- **Design & Layout:** Add a suitable theme & layout according to the content of all 10 slides.
- **Header & Footer:** Header: Insert the title & author; Footer: Insert date & slide number
- **Font & Paragraph:** Font Face, Size & Color - Alignment - Bullets & Numberings
- **Insert:** Images & Tables

#### **EXERCISE 8 (PRESENTATION)**

Create a presentation of 10 slides about your college with Slide & Custom Animation, Shapes, Header & Footer, Slide number, Video, Audio, Picture, Tables and Hyperlink between slides.

- **Design & Layout:** Add a suitable Theme and Layout according to the content of all 10 slides.
- **Header & Footer:** Header: Insert the Title & Author; Footer : Insert the Date & Slide Number
- **Font & Paragraph:** Font Face, Size & Color - Alignment - Bullets & Numberings
- **Insert:** Video / Audio / Tables / Shapes
- **Hyperlink:** Use hyperlink to link between slides.
- **Animation:** Custom Animation for individual Objects / Slide Transition to all slides.

#### **Note:**

1. The student should be given proper training in all the exercises. All the exercises should be completed before examination.
2. The student should maintain observation note book / manual and record notebook. The record note book should be submitted during the Practical Examinations. Individual output for every exercise should be kept in the record note book.
3. During examination, the students are allowed to select any one exercise by lot. All exercises should be given for examination.

#### **ALLOCATION OF MARKS**

<b>Description</b>		<b>Marks</b>
1	Aim & Procedure	20
2	Execution	50
3	Output printout / Handout	20
4	Viva voce	10
<b>Total</b>		<b>100</b>

# SECOND SEMESTER

## 6021 COMMUNICATIVE ENGLISH - II

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
	4 Hrs	64 Hrs	Internal Assessment	External Exam*	Total	
6021 COMMUNICATIVE ENGLISH - II			25	75	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
<b>I</b>	<b>Functional Grammar and Usage</b> Application of Modal Verbs Negative Formation (No, Never, Nothing, Hardly, Seldom, No longer, None, Nowhere, Neither . . . nor) Use of Subordinating Conjunctions Use of Conditionals Reported Speech (Dialogue to Indirect Speech) Punctuation Synthesis of three or more sentences	<b>13</b>
<b>II</b>	<b>English for Enrichment</b> The Language Game: Unscramble Phrases (Noun Phrase, Verb Phrase, Prepositional Phrase, etc.) Cause and Effect Writing Suitable Responses to the Given Questions Giving Instructions Character sketch	<b>11</b>
<b>III</b>	<b>Situational English</b> Email for Official Communication Social Media Language Reacting to Situations Correction of Sentences Proverbs for Everyday Situations	<b>11</b>
<b>IV</b>	<b>Creative English</b> The Language Game: Word Puzzle Grid Notice Writing for the Given Situations Slogan Writing Technical Words Infographics Comprehension Story completion	<b>11</b>
<b>V</b>	<b>English for Scholarly Presentation / Fluency</b> "The Lost Child" by Mulk Raj Anand "My Vision for India" by Abdul Kalam "From Lover's Gift" by Rabindranath Tagore "The Flower" by Tennyson	<b>11</b>

### Reference Books:

#### Glossaries

<https://www.engineering-dictionary.com/> <https://techterms.com/definition/>

<http://dictionary.tamilcube.com/> [https://www.lexilogos.com/english/tamil\\_dictionary.htm](https://www.lexilogos.com/english/tamil_dictionary.htm)

#### Grammar

1. Just Enough English Grammar Illustrated, Gabriele Stobbe, McGraw-Hill Osborne Media, 2008
2. Visual Guide to Grammar and Punctuation, DK Publishing, 2017
3. English Grammar in Use, Raymond Murphy, Cambridge University Press, 2019
4. Intermediate English Grammar, Raymond Murphy, Cambridge University Press, 2<sup>nd</sup> Edition.
5. Essential English Grammar, Raymond Murphy, Cambridge University Press, New edition.

#### Enrichment of Study

1. Enrich Your Vocabulary: Vocabulary for General, Placement & Competitive Exams- Edin Brow

#### Motivation

1. An Autobiography; Or, The Story of My Experiments with Truth, Mahatma Gandhi, Penguin Books, 2001
2. You Can Win, Shiv Khera, New Dawn Press, 2004
3. Chicken Soup for the Soul, Jack Canfield, Mark Victor Hansen, 2001

## 4. How to Win Friends and Influence People by Dale Carnegie

**QUESTION PAPER PATTERN****Model Examination / Autonomous Examination**

Time: 3 Hrs.

Max. Marks: 100

Sl. No	Questions	Portions	Marks
1	Answer any TEN out of 12 questions	Unit I & II - Grammar items	10 x 4 = 40
2	Answer any FOUR out of 6 questions	Unit III - Composition items	4 x 5 = 20
3	Answer any FOUR out of 6 questions	Unit IV - Composition items	4 x 5 = 20
4	Answer any FOUR out of 6 questions	Unit V - Prose & Poetry	4 x 5 = 20
<b>TOTAL</b>			<b>100</b>

**6022 ENGINEERING MATHEMATICS - II**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6022 ENGINEERING MATHEMATICS - II	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
I	<b>ANALYTICAL GEOMETRY</b> <b>1.1 ANALYTICAL GEOMETRY</b> Circles - General equation of a circle - Family of circles - Concentric circles - Orthogonal circles (condition only) - contact of circles - simple problems.	6
	<b>1.2 CONICS</b> Definition of a conic, Focus, Directrix and Eccentricity - General equation of a conic $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ . (Statement only) - Condition for conic For circle $a = b$ and $h = 0$ For pair of straight line : $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$ For parabola : $h^2 - ab = 0$ For ellipse : $h^2 - ab < 0$ and (v) For hyperbola : $h^2 - ab > 0$ - simple problems.	8
II	<b>VECTOR ALGEBRA - I</b> <b>2.1 VECTOR - INTRODUCTION</b> Definition of vector - types, addition, subtraction and scalar multiplication of vector, properties of addition and subtraction - Position vector - Resolution of vector in three dimensions - Distance between two points - Direction cosines and direction ratios - simple problems.	7
	<b>2.2 PRODUCT OF TWO VECTORS</b> Scalar product - Vector product - condition for parallel and perpendicular vectors - properties - angle between two vectors - Unit vector perpendicular to two vectors - Application of Scalar and Vector product - simple problems.	7
III	<b>INTEGRAL CALCULUS - I</b> <b>3.1 INTEGRATION - DECOMPOSITION METHOD</b> Historical approach for integration - Anti derivative - Definition of the integral as an anti-derivative - Fundamental rules for integration - Integration using decomposition method - simple problems based on Engineering applications.	5

	<p><b>3.2 METHODS OF INTEGRATION - INTEGRATION BY SUBSTITUTION</b></p> <p>Integrals of the form <math>\int [f(x)]^n f'(x)dx</math>, Where <math>n \neq -1</math> <math>\int \frac{f'(x)}{f(x)}dx</math> and <math>\int F[f(x)]f'(x)dx</math> - simple problems.</p> <p><b>3.3 STANDARD INTEGRALS</b></p> <p>Integrals of the form, <math>\int \frac{dx}{a^2 \pm x^2}</math>, <math>\int \frac{dx}{x^2 - a^2}</math>, <math>\int \frac{dx}{\sqrt{a^2 - x^2}}</math>, <math>\int \sqrt{a^2 - x^2} dx</math>, <math>\int \sqrt{x^2 \pm a^2} dx</math> - simple problems.</p>	5 5
IV	<p align="center"><b>INTEGRAL CALCULUS - II</b></p> <p><b>4.1 METHODS OF INTEGRATION - INTEGRATION BY PARTS</b></p> <p>Integrals of the form <math>\int x \sin nx dx</math>, <math>\int x \cos nx dx</math>, <math>\int x e^{nx} dx</math>, <math>\int x^n \log x dx</math>, and <math>\int \log x dx</math> - simple problems.</p> <p><b>4.2 BERNOULLI'S FORMULA</b></p> <p>Evaluation for the integrals <math>\int x^m \sin nx dx</math>, <math>\int x^m \cos nx dx</math>, <math>\int x^m e^{nx} dx</math>, where <math>m \leq 3</math> using Bernoulli's formula - simple problems.</p> <p><b>4.3 DEFINITE INTEGRALS</b></p> <p>Definition of definite integral - Properties of definite integrals - simple problems.</p>	4 5 6
	<p align="center"><b>APPLICATIONS OF INTEGRATION</b></p> <p><b>5.1 AREA AND VOLUME</b></p> <p>Area and volume - Area of circle - Volume of sphere and cone - simple problems.</p> <p><b>5.2 FIRST ORDER DIFFERENTIAL EQUATIONS</b></p> <p>Solution of first order variable separable type differential equations - Solution of linear type differential equations - simple problems.</p> <p><b>5.3 SECOND ORDER DIFFERENTIAL EQUATIONS</b></p> <p>Solution of second order differential equations with constant co- efficient</p> <p>(i) <math>a \frac{d^2y}{dx^2} + b \frac{dy}{dx} + cy = 0</math></p> <p>(ii) <math>a \frac{d^2y}{dx^2} + b \frac{dy}{dx} + cy = f(x)</math>, where <math>f(x) = e^{ax}</math> - simple problems.</p>	5 5 5
	V	

#### Reference Books:

- Higher Secondary +1 Mathematics volume I & II. Tamil Nadu Text Book Corporation.
- Higher Secondary +2 Mathematics Volume I & II. Tamil Nadu Text Book Corporation.
- Engineering Mathematics V. Sundaram, R. Balasubramanian.
- Engineering Mathematics - I C.B.Gupta ,A.K.Malik, New age international Pub., 1<sup>st</sup> ed, - 2008.
- Differential Calculus S. Balachandra Rao, CK Shantha New age Publishers
- Probability Theory and Stochastic Process B.Prabhakara Rao, TSR Murthy, BS Publishers.

#### QUESTION PAPER PATTERN: General Pattern

### 6023 ENGINEERING PHYSICS - II

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6023 ENGINEERING PHYSICS - II	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
I	<p><b>HEAT</b></p> <p><b>1.1 TRANSFER OF HEAT</b></p> <p>Concept of Heat and temperature - Celsius, Fahrenheit and Kelvin scales of</p>	5

	<p>temperature - Conduction, convection and radiation - Definitions and explanations - Good and poor thermal conductors - Examples - Coefficient of thermal conductivity - Definition and its SI unit - Properties of thermal radiation - Heat conversions.</p> <p><b>1.2 KINETIC THEORY OF GASES</b>          Postulates of kinetic theory of gases - Mean square velocity and Root Mean Square (RMS) velocity of molecules - Definitions and expressions - Expression for the pressure of a gas on the basis of postulates of kinetic theory of gases - Relation between pressure and kinetic energy of the gas - Relation between kinetic energy and absolute temperature of the gas - Simple problems based on the expression for the pressure of a gas.</p> <p><b>1.3 SPECIFIC HEAT CAPACITY</b>          Specific heat capacity of a substance (solids and liquids) - Definition - Specific heat capacity of a gas at constant pressure - Specific heat capacity of a gas at constant volume - Ratio of specific heat capacities - Explanation for <math>C_p</math> is greater than <math>C_v</math> - Derivation of Mayer's relation - Calculation of Universal gas constant R from the gas equation (<math>PV = RT</math>) - Simple problems based on Mayer's relation.</p>	5
<b>II</b>	<p><b>THERMODYNAMICS, LIQUEFACTION OF GASES AND NON-CONVENTIONAL ENERGY</b></p> <p><b>2.1 THERMODYNAMICS</b>          Concept of internal energy - First law of thermodynamics - Statement - Concept of indicator diagram (PV Diagram) - Isothermal and adiabatic change - Explanation - Equation for isothermal and adiabatic change (No derivation) - Simple problems based on equations <math>P_1V_1 = P_2V_2</math> and <math>P_1V_1^\gamma = P_2V_2^\gamma</math> - Second law of thermodynamics - Clausius statement and Kelvin's statement - Working of Carnot engine with PV diagram - Efficiency of Carnot engine - Applications of heat and thermodynamics.</p> <p><b>2.2 LIQUEFACTION OF GASES</b>          Difference between gas and vapour - Critical temperature, critical pressure and critical volume - Definitions - Principle used in Cascade process - Cascade process of liquefaction of oxygen - Disadvantages of Cascade process - Joule Thomson effect - Temperature of inversion - Liquefaction of air by Linde's process.</p> <p><b>2.3 NON-CONVENTIONAL ENERGY</b>          Introduction - Non-renewable and Renewable (Alternate) energy sources - Examples - Solar energy - Wind energy - Tidal energy - Advantages and disadvantages of renewable energy.</p>	6
<b>III</b>	<p><b>LIGHT</b></p> <p><b>3.1 OPTICS</b>          Reflection - Laws of reflection - Refraction - Laws of refraction - Refractive index of a medium - Definitions - Derivation of refractive index of glass prism using minimum deviation - Spectrometer - Experimental determination of refractive index using spectrometer - Phenomenon of total internal reflection - Applications of total internal reflection - Fiber optics - Introduction - Optical Fiber Cable as a wave guide - Advantages of OFC - Problems based on refractive index.</p> <p><b>3.2 LASER</b>          LASER - Characteristics of LASER - Principle of LASER - Spontaneous emission - Stimulated emission - Population inversion - Ruby Laser - Construction and working - Uses of LASER.</p> <p><b>3.3 REMOTE SENSING</b>          Introduction - Active &amp; passive remote sensing - Explanation &amp; examples - Components of remote sensing - Data acquisition and data analysis - Reference data - RADAR - Principle and working with block diagram.</p>	6
<b>IV</b>	<p><b>ELECTRICITY</b></p> <p><b>4.1 ELECTRICAL CIRCUITS</b>          Ohm's law - Laws of resistances - Resistivity, conductivity, super conductivity and Meissner effect - Definitions - Kirchhoff's current and voltage laws - Condition for</p>	5

	<p>balancing the Wheatstone's bridge - Simple problems based on expression for resistivity - Capacitance of a capacitor - Definition - 'farad' - Definition - Expressions for effective capacitance when capacitors are connected in series and in parallel - Simple problems based on effective capacitance of capacitors connected in series and in parallel - Applications of capacitors.</p> <p><b>4.2 EFFECTS OF CURRENT</b>          Joule's law of heating - Experimental determination of specific heat capacity of a liquid using Joule's calorimeter - Faraday's laws on electrolysis - Electro chemical equivalent (e.c.e) of an element - Definition - Experimental determination of e.c.e. of copper - Simple problems based on expressions for e.c.e - Applications of heating effect of electric current.</p> <p><b>4.3 ELECTROMAGNETIC INDUCTION</b>          Introduction - Magnetic flux - Faraday's experiments on electromagnetic induction - Lenz's law - Fleming's right hand rule - Self induction and mutual induction (definitions) - Applications of electromagnetic induction.</p> <p><b>4.4 MEASURING INSTRUMENTS</b>          Expression for the force acting on a current carrying straight conductor placed in a uniform magnetic field - Fleming's Left Hand rule - Expression for the torque experienced by a rectangular current carrying coil placed inside a uniform magnetic field - Working of a moving coil galvanometer and its merits - Conversion of galvanometer into an ammeter and voltmeter - Simple problems based on conversion of galvanometer into ammeter and voltmeter.</p>	4  2  4
<b>V</b>	<p><b>ELECTRONICS</b></p> <p><b>5.1 SEMICONDUCTORS</b>          Introduction - Energy bands in solids - Energy band diagram of good conductors, insulators and semiconductors - Concept of Fermi level - Types of semiconductors - Intrinsic semiconductors - Concept of holes - Doping - Extrinsic semiconductors - P type and N type semiconductors.</p> <p><b>5.2 DIODES AND TRANSISTORS</b>          PN junction diode - Forward bias and reverse bias - Rectification action of diode - Working of full wave bridge rectifier using PN junction diodes - PNP and NPN transistors - Three different configurations - Working of NPN and PNP transistor in common base configuration.</p> <p><b>5.3 DIGITAL ELECTRONICS</b>          Digital electronics - Introduction - Logic levels-Basic logic gates-OR, AND, NOT gates - Universal logic gates - NAND and NOR gates - Symbolic representation, Boolean expression and truth table for all the above logic gates - Integrated circuits - Levels of integration - SSI, MSI, LSI and VLSI - Advantages of ICs - Applications of transistors, gates and ICs.</p>	5  5  5

**Reference Books:**

1. Fundamentals of Physics - Halliday & Resnick - Wiley India Pvt. Ltd. - Sixth Edition
2. Fundamentals of Magnetism and Electricity - D.N. Vasudeva - S. Chand Publishing - 5<sup>th</sup> Ed.
3. Physics for Higher Secondary - First & Second year - Volume I & II - Tamilnadu Textbook and Educational Services Corporation 2018
4. Non-conventional energy sources - G.D. Rai - Khanna Publishers - Sixth Edition
5. Textbook of Remote Sensing and Geographical Information Systems - M. Anji Reddy - BS Publications - Fourth Edition.

**QUESTION PAPER PATTERN: General Pattern**

**6024 ENGINEERING CHEMISTRY - II**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6024 ENGINEERING CHEMISTRY - II	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	

			25	75	100	3 Hrs
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\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

Unit	Name of the Topics	Hrs
	<b>ENVIRONMENTAL CHEMISTRY</b> <b>1.1 AIR POLLUTION</b> Pollution and air pollution – Definition - Air pollutants (SO <sub>2</sub> , H <sub>2</sub> S, HF, CO and dust) - Harmful effects - Formation of acid rain - Harmful effects - Green house effect - Causes - Global warming - Harmful effects - Ozone layer - Importance - Causes for depletion of ozone layer (No equations) - Harmful effects of Ozone layer depletion - Control of air pollution.	<b>6</b>
	<b>ENVIRONMENTAL CHEMISTRY</b> <b>1.2 WATER POLLUTION</b> Causes of water pollution - (Sewage, Effluents, Algae and Micro-organisms) - Sewage - Definition - Problems and disposal of sewage - Industrial effluents - Harmful effects of heavy metal ions (Lead, Cadmium, Zinc and Copper) - Treatment of effluents - Eutrophication - Definition and harmful effects. <b>1.3 SOLID WASTE MANAGEMENT</b> Solid waste - Definition - Problems - Types of solid waste - Methods of disposal - Land fill and incineration. Recycling - Definition - Examples - Advantages of recycling (Basic concepts). <b>1.4 GREEN CHEMISTRY</b> Definition - Goals of Green Chemistry (Basic concepts)	<b>5</b>  <b>3</b>  <b>1</b>
<b>II</b>	<b>POLYMER CHEMISTRY</b> <b>2.1 PLASTICS</b> Plastics - Definition - Types of polymerization - Addition polymerization - Formation of polythene - Condensation polymerization - Formation of Bakelite - Types of plastics - Thermoplastics and thermosetting plastics – Differences - Mechanical properties of plastics - Advantages of plastics over traditional materials (wood and metal) - Specific uses of some plastics (Bakelite, PVC, Nylon & Urea-formaldehyde) - Polymers in surgery - Biomaterials - Definition - Biomedical uses of polyurethane, PVC, Polypropylene and Polyethylene. <b>2.2 RUBBER</b> Rubber - Definition - Preparation of natural rubber from latex - Defects of natural rubber - Compounding of rubber - Ingredients and their functions - Vulcanization of rubber - Definition & purpose-Synthetic rubber-Buna-S, Thiokol, Neoprene-Reclaimed rubber-Definition-Process-Properties&uses.	<b>8</b>  <b>6</b>
<b>III</b>	<b>FUELS, ROCKET PROPELLANTS AND REFRACTORY</b> <b>3.1 FUELS</b> Fuel - Definition - Calorific value of fuels - Classification - Solid fuels - Wood - Coal - Varieties of coal - Composition - Specific uses - Liquid fuels - Refining of petroleum - Fractional distillation - Cracking (concept only) - Liquid hydrogen - Gaseous fuels - Preparation, composition and specific uses of producer gas and water gas - Composition and uses of LPG - Advantages of gaseous fuels - comparison of solid, liquid and gaseous fuels. <b>3.2 ROCKET PROPELLANTS</b> Definition - Characteristics - Classification of propellants - brief account of solid and liquid propellants with example. <b>3.3 REFRACTORY</b> Definition - Requirements of a good refractory - Classification - Acidic, basic and neutral refractory - Examples and uses - Uses of fire clay bricks, Alumina bricks and Silica bricks.	<b>6</b>  <b>4</b>  <b>4</b>
<b>IV</b>	<b>METALLURGY, EXTRACTION OF METALS, ALLOYS, LIME AND CEMENT</b> <b>4.1 METALLURGY</b> General principles of metallurgy - Minerals, ores, gangue, flux, slag - Metallurgical processes - Concentration of the ore (gravity separation, froth	<b>5</b>

	floatation process and magnetic separation) - Chemical methods of purifying ore (roasting, calcination, smelting ) - Refining - Electrolytic refining, Van Arkel method, Distillation method. <b>4.2 EXTRACTION OF METALS</b> Extraction and uses of tungsten and titanium. <b>4.3 ALLOYS</b> Definition - Purpose of alloying - Types - Ferrous alloys - Composition and uses of Stainless steel, Chromium steel and Vanadium steel - Non-ferrous alloys - Composition and uses of Brass, Dutch metal (German silver), Bronze (Gunmetal), Nickel alloys (Nichrome), Aluminium alloys (Duralumin). <b>4.4 LIME AND CEMENT</b> Lime - raw materials used for lime - Manufacture of hydraulic lime by continuous vertical kiln process - properties - slaking, plasticity and setting. Cement - Definition - Manufacture of portland cement - Wet process - Setting of cement (No equation).	2
		4
		4
<b>V</b>	<b>CORROSION AND PREVENTION OF CORROSION</b> <b>5.1 CORROSION</b> Definition - Types of corrosion - Theories of corrosion - Galvanic cell formation theory - Differential aeration theory - Factors influencing the rate of corrosion. <b>5.2 METHODS OF PREVENTION OF CORROSION</b> Control of environment - Alloying - Surface coatings - Metal coatings - Electroplating, galvanization and tinning - Inorganic coating - Anodisation and phosphate coating - Cathodic protection - Sacrificial anode method and impressed voltage method. <b>5.3 ORGANIC COATINGS</b> Paint - Definition - Components of paints - Varnish - Definition - Types - Preparation of oil varnish - Differences between paint and varnish - Special paints - Luminescent paint, fire retardant paint, aluminium paint and distemper.	5
		5
		5

#### Reference Books:

1. Introduction to Engineering Chemistry, Shradha Sinha , S S Dara & SudhaJain, S.Chand Publishers, 2004.
2. Engineering Chemistry, S S Dara, Sudha Jain & Shradha Sinha, S.Chand Publishers,2005.
3. A Textbook of Engineering Chemistry, Dr. Uday Kumar, 2013.
4. Chemistry - Higher Secondary - I & II year, Vol. I & II, Tamil Nadu Text Book Corp 2018.
5. Engineering Chemistry Fundamentals and Applications, Shikha Agarwal, Cambridge University Press, 2019.
6. Electrochemistry and Corrosion Science, Nestor Perez.
7. Indian Minerals Year book 2011.

#### QUESTION PAPER PATTERN: General Pattern

### 6025 ENGINEERING GRAPHICS - II COMPUTER AIDED DRAWING PRACTICAL

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6025 ENGINEERING GRAPHICS - II (PRACTICAL)	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

#### INTRODUCTION TO AUTOCAD

**10 Hrs**

History of AutoCAD - Applications - Advantages over manual drafting - Hardware requirements - Software requirements - Window desktop - AutoCAD screen interface -



Menus - Toolbars - How to start AutoCAD - Command groups - How to execute command - Types of coordinate systems - Absolute - Relative - Polar.

**EXERCISE:**

**I. ELECTRICAL SYMBOLS**

**15 Hrs**

Incandescent lamp - Fluorescent Lamp - Signal lamp - Push button - Fire alarm - Siren - Water heater - Ceiling fan - Exhaust fan.

Relays - Contactors - Fuses - Main switch - Electric bell - Earth - Aerial - DPST - DPDT - TPST - Network link - Ammeters - Voltmeters - Wattmeter - Energy meters - Frequency meters - Power factor meters - Timers - Buzzers - Transformers - Auto transformers - IGBT.

Draw symbols of DC armatures - Alternators - Squirrel and slip ring induction motors - Field winding - Shunt, series and compound DC motors.

**II. ELECTRONICS SYMBOLS:**

**15 Hrs**

Draw symbols of resistors - Inductors - Capacitors - Diodes - Transistors - FET - SCR - UJT - DIAC - TRIAC - MOSFET'S - LOGIC GATES - AND - OR - NOT - NAND - NOR – EXOR.

**III. ELECTRICAL CONNECTION DIAGRAMS:**

**40 Hrs**

1. Draw the panel wiring diagram of two shunt generators in parallel.
2. Draw the mush winding diagram of a three phase induction motor.
3. Draw the control circuit of automatic rotor starters.
4. Draw the connection diagram of on load tap changer.
5. Draw the circuit of three phase transformers in parallel.
6. Draw the connections of three point starter.
7. Draw the connections of direct on line starter.
8. Draw the line diagram of wiring of a drawing hall.
9. Draw the single line diagram of residential wiring.
10. Draw the single line diagram of substation.

**QUESTION PAPER PATTERN**

The marks will be awarded as per the scheme of valuation given below.

**SCHEME OF VALUATION**

Sl. No	Category	Marks
1	Drawing the symbols in Electrical and Electronics. Any 10 Symbols (10 questions x 3 marks)	30 marks
2	Electrical Connection Diagram (Any one)	60 marks
3	Viva-voce	10 marks
	<b>TOTAL</b>	<b>100 marks</b>

**Reference Books:**

1. Machine drawing with AutoCAD - Goutam Pohil
2. AutoCAD 2017 - Goutam Ghosh
3. AutoCAD 2008 for Engineers & Designers by Prof. Sham Tickoo pub by dream Tech Press.
4. AutoCAD 2010 & AutoCAD LT 2010 by Ellen Finkelstein published by Wiley-India.
5. A Textbook for Electrical Estimating and Costing by Garg and Gupta – Tech India Pub.
6. Electrical and Electronics Drawing by Charles J Baer, MCGraw Hill Book Co.
7. A TB of Electrical Technology, Vol 2, AC and DC Machines, B L Theraja and A K Theraja
8. Engineering Drawing - Electrical Trade by A K Xavier and S Radhakrishnan

## 6026 ENGINEERING PHYSICS PRACTICAL - II

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6026 ENGINEERING PHYSICS PRACTICAL - II	2 Hrs	32 Hrs	Internal Assessment	External Exam*	Total	
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### LIST OF EXPERIMENTS WITH OBJECTIVES:

1. SOLAR CELL - To study the VI characteristics of the given solar cell.
2. REFRACTIVE INDEX - To determine the refractive index of water using travelling microscope.
3. LAWS OF RESISTANCES - To verify the laws of resistances using Ohm's law.
4. METRE BRIDGE - To determine the unknown resistance of given wire using metre bridge.
5. POTENTIOMETER - To compare the emfs of the given two cells.
6. JOULE'S CALORIMETER - To determine the specific heat capacity of water using Joule's calorimeter.
7. TANGENT GALVANOMETER - To determine the value of the horizontal component of the earth's magnetic field using tangent galvanometer.
8. PN JUNCTION DIODE - To study the voltage-current characteristics of the given PN junction diode in forward bias and to find its dynamic forward resistance.
9. TRANSISTOR CHARACTERISTICS - To study the transfer characteristics of the given NPN transistor in common emitter configuration and to find its current gain.
10. LOGIC GATES - To find the output conditions for different combinations of the input for NOT gate and 2 inputs AND, OR, NAND & NOR logic gates using IC chips.

### QUESTION PAPER PATTERN

Answer any one of the above experiment chosen by random method. The marks will be awarded as per the scheme of valuation given below.

#### SCHEME OF VALUATION

S. No	Category	Marks
1	Formula and diagram	20
2	Tabulation	10
3	Observation	40
4	Calculation	15
5	Result	10
6	Viva voce	05
Total		<b>100</b>

## 6027 ENGINEERING CHEMISTRY PRACTICAL - II

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks		Duration	
6027 ENGINEERING CHEMISTRY PRACTICAL - II	2 Hrs	32 Hrs	Internal Assessment	External Exam*		Total
			25	75	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### QUALITATIVE ANALYSIS;

**ACID RADICALS:** 1. Carbonate 2. Chloride 3. Nitrate 4. Sulphate

**BASIC RADICALS:** 1. Lead 2. Copper 3. Aluminium 4. Zinc

5. Barium 6. Calcium 7. Magnesium 8. Ammonium

**ANALYSIS OF INORGANIC SIMPLE SALT:**

Analysis of eight inorganic simple salts containing any one acid radical and basic radical without omitting any of the above mentioned radicals

**QUESTION PAPER PATTERN**

Answer any one of the above Inorganic simple salt chosen by random method. The marks will be awarded as per the scheme of evaluation.

**SCHEME OF VALUATION**

Description	Marks
Identification procedure of acid radical with systematic procedure	45
Identification procedure of basic radical with systematic procedure	45
Viva voce	10
<b>Total</b>	<b>100</b>
<b>Without systematic procedure</b>	
Identification of acid radical with confirmatory test only	45
Identification of basic radical with confirmatory test only	45
Mere spotting of acid radical and basic radical (5+5)	10
Writing systematic procedure without correct radicals	20

**6028 BASICS OF INDUSTRIES AND WORKSHOP PRACTICAL - II**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6028 BASICS OF INDUSTRIES AND WORKSHOP PRACTICAL - II	Theory *: 2 Practical: 3	80 Hrs	Internal Assessment	External Exam**	Total	
			25	75	100	

\* Theory Portion common for all branches.

\*\* Examination will be conducted for 100 marks (45 Marks Theory and 55 Marks Practical) and the marks obtained will be converted into 75 marks.

**BASICS OF INDUSTRIES: (Common for All Branches)**

Unit	Name of the Topics	Hrs
I	<b>BASICS OF INDUSTRIES</b> Industry - Need of Industrialization - Classification - Factors influences the location of the Industries - Types of Industries: Small scale, Medium scale and Large scale industries - Procedure to start up an Industry. Manufacturing Industry - Overviews - Global manufacture. Engineering Industry: Introduction - Engineering materials – Products of various engineering sectors.	6
II	<b>INDUSTRIAL SAFETY MEASURES AND MAINTENANCE</b> Industrial safety - Importance - Safety activities - Safety equipment - Health and safety procedure - Personnel protective devices - Safe working practices - Structural collapse - Safety signs. Accident - Causes - Prevention of accidents - Electric shock- Safety precautions against electric shock - Significance of first aid. Plant Maintenance: Introduction - Objectives - Importance. Maintenance practices: Breakdown maintenance - Preventive maintenance - Scheduled maintenance - Predictive maintenance -Standard data for maintenance. TPM: Introduction - Objectives - Steps of TPM process.	6

<b>III</b>	<b>QUALITY AND STANDARDS</b> Definition of quality - Quality control - Quality assurance - Modern management techniques - Just In Time (JIT) - Total Quality Management (TQM) - Introduction - PDSA cycle - Kaizen - TQM Tools - Bench marking - Quality circle - Zero Defect Concept - 5S principle - Sort, Set in order, Shine, Standardise and Sustain - Necessity of 5S - Six Sigma - Essential elements - Methodologies - Six sigma belt - SWOT analysis. BIS for construction - National Building Code - ISO standards - ISI Standards - Intellectual property rights - Engineering Ethics -.Brief description only.	<b>6</b>
<b>IV</b>	<b>BASICS OF ENGINEERING</b> Tolerance - Limits - Deviation - Allowance - Definitions only - Types of tolerances: Unilateral, Bilateral - Fits - Types of fits. Types of structures - List of materials used for building construction - Requirements of water for construction. Mortar: Types and its properties. Concrete: Constituents – Requirements - Types of grouting materials - Types of roofing - Types of foundation - requirements of good foundation - Standard sizes of doors and windows. Weathering course: Purpose - Materials required. Earthquake: Types of earth quake and its remedial measures. Rain water harvesting - Types - Importance. EMF - Current - Potential difference - Electric power - Definitions only. Wiring - Types of wires - Internal wiring - Cleat wiring - Surface conduit wiring - Concealed conduit.	<b>8</b>
<b>V</b>	<b>INDUSTRY 4.0</b> Industrial revolution - Definition – History - Industry 4.0 - Definition - Design principles and goals - Industry 4.0 technologies - Big data - Cloud computing - Internet of Things (IoT) - Simulation - Autonomous robots - Augmented reality - Cyber security - System integration - Additive manufacturing. Evolution of Industry 4.0 - Global readiness - Global trend - Initiative by Industries and Government - Importance of Industry 4.0.	<b>6</b>

**Reference Books:**

1. Industrial Organisation & Engineering Economics - "T.R.Banga,S.C.Sharma"-Khanna Pub.
2. Industrial Engineering and Management "O.P. Khana" - Dhanbat Rai Publications.
3. Machine Drawing - K.L.Narayana, P.Kannaiah, K.Venkata reddy - New Age Int. Publishers
4. Elements of Civil Engineering - Bhavikatti
5. A Text Book of Electrical Technology - B.L. Theraja, A.K. Theraja-S.Chand&Company Ltd.
6. Testing, Commissioning, Operation and Maintenance of Electrical Equipments - S.Rao - Khanna Publishers.
7. A Course in Electrical Power by Soni & Gupta - Dhanbat Rai & Sons, New Delhi.

**INTERNAL ASSESSMENT**

Assignment (Theory portion)*	10 marks
Practical (Observation (5) and Record work (5))	10 marks
Attendance	05 marks
<b>Total</b>	<b>25 marks</b>

**Note: Three assignments will be given and the marks will be converted to 10 marks.**

- First assignment - Unit I & II
- Second assignment - Unit III & IV
- Third assignment - All Units

Each assignment should have five two marks questions and two five marks questions.

**END SEMESTER EXAMINATION**

**Note:**

1. The students should maintain theory assignment, observation note book / manual and record notebook. The assignment and record note book should be submitted during the Practical Examinations.
2. The question paper consists of theory and practical portions. All students should write

the answers for theory portions (45 Marks) and practical portion (55 Marks).

3. For theory portions:

Ten questions (2 from each unit) will be asked for 2 marks each. (10 x 2 = 20)

Five questions (2 from each unit) will be asked for 5 marks each. (5 x 5 = 25)

## 6028 WORKSHOP PRACTICAL - II

### I. ELECTRICAL WIRING

Introduction of Electrical wiring

04 Hrs

**Exercises:**

**20 Hrs**

1. One LED lamp controlled by one switch.
2. Two LED lamps controlled by one-way switch in series connection.
3. Two LED lamps controlled by one-way switch in parallel connection.
4. Two LED lamps controlled by two individual switches.
5. Draw the circuit and execute stair case wiring.
6. Draw the circuit and connect the LED Lamp, Fluorescent lamp and one plug point socket with individual switch control in a board.

### II. ELECTRONICS

Introduction of Electronic Circuits

04 Hrs

**Exercises:**

**20 Hrs**

1. Construct and execute a circuit to Switch ON a LED with a DC power source in bread board.
2. Construct and execute the switching circuit using transistor.
3. Construct and execute a full wave rectifier circuit using Diode and observe the waveforms using CRO.
4. Construct and execute a full wave rectifier circuit using Diode with capacitor and observe the waveforms using CRO.
5. Construct and execute a bridge rectifier, execute it and observe the output waveform using CRO.
6. Practice to solder and de-solder of a resistive circuit in a Printed Circuit Board.

### QUESTION PAPER PATTERN

A. Theory Question and Answer (5 x 9 = 45 Marks)	45 Marks
B. Electrical Exercise	25 marks
C. Electronics Exercise	25 marks
Viva voce	05 marks
<b>Total</b>	<b>100 marks</b>

### 6001 COMMUNICATION SKILL PRACTICAL

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
<b>6001 COMMUNICATION SKILL PRACTICAL</b>	2 Hrs	32 Hrs	<b>Internal Assessment</b>	<b>External Exam*</b>	<b>Total</b>	
			25	75	100	

\* Examination will be conducted for 100 marks & the marks obtained will be converted into 75 marks

Unit	Name of the Topics	Hrs
<b>I</b>	<b>LISTENING SKILL</b> Listening to speeches by Great speakers / TV News (Assessment through note taking) Listening to short stories (Assessment by vocabulary check) Listening to Indian / British / American English (Assessment by cloze)	<b>10</b>

<b>II</b>	<b>READING SKILL</b> Stress & Intonation Tongue twisters / Tongue modulators frequently Mispronounced words Reading Newspaper - (Skimming & Scanning)	<b>6</b>
<b>III</b>	<b>SPEAKING SKILL</b> Polite expressions (Greeting, Requesting, Thanking, Apologizing, Opinions, Suggestions) Introducing Yourself / Friends / Family Recite - quotes of Leaders / Scholars / Scientists Face to face conversation	<b>10</b>
<b>IV</b>	<b>WRITING SKILL</b> Thought fillers Completing an Incomplete story How to prepare PPT Non-verbal communication	<b>6</b>

Note:

1. The students should be given proper practice in all the exercises. All the exercises should be completed before the examinations.
2. The students should maintain a record note book. The record note book should be submitted during the semester practical examinations.

**PART A - LISTENING (No. of Exercises: 3, Duration: 45 min.)**

Exercise	Particulars
1	The examiner shall play either the audio of the speech of a Great speaker or that of TV news running from 3 to 5 min. The audio can be played twice. The candidates may be given 10 minutes to take notes as directed in the question paper.
2	A short story selected by the external examiner shall be played only once without transcript. The objective of this exercise is to test the listening ability of the candidate and therefore questions should be framed accordingly in the pattern of question and answer. The time to complete this exercise is 5 minutes.
3	Any one of the audios (British English, American English or Indian English) may be selected by the external examiner and the same shall be played only once. Maximum of 5 questions for filling in the blanks may be given and the candidates may be provided maximum of 10 minutes to answer the questions.

This part shall be completed within 45 minutes including the time used for playing listening audios.

**PART B - READING (No. of Exercises: 3, Duration: 45 min.)**

Each batch may be divided into two groups. Both examiners may engage all the students.

Exercise	Particulars
1	Readout the tongue twister.
2	A passage from newspaper can be given for reading.
3	Pronounce the words correctly.

This part shall be completed within 45 minutes.

**PART C - SPEAKING (No. of Exercises: 4, Duration: 45 min.)**

Divide the students to make it convenient for conversations in English by a pair. Both examiners can handle.

Exercise	Particulars
1	Polite expressions for the context provided.
2	Self-introduction for the interview.
3	Any five quotes can be recited from the given list of quotes of Leaders, Scholars and Scientists.
4	The candidates have to speak as directed by the concerned examiner. All the questions are mandatory.

This part shall be completed within 45 minutes.

#### **PART D - WRITING (No. of Exercises: 3, Duration: 45 min.)**

All students should appear for this part.

Exercise	Particulars
1	Five questions with blanks shall be asked based on a list of 25 frequently used thought fillers already trained during lab classes.
2	Shall consist of an unknown incomplete story providing scope for further development and application of imagination. (Minimum 3 lines for completion with suitable title and moral)
3	Questions can be taken from a list of fifteen important questions covering the core areas of non-verbal communication. (Five out of eight questions to be answered)

This part shall be completed within 30 minutes.

#### **ALLOCATION OF MARKS**

Description		Marks
A	Listening	30
B	Reading	20
C	Speaking	30
D	Writing	20
<b>Total</b>		<b>100</b>

#### **Guidelines for Conduct of Practical Classes and Writing Record Note:**

There are 13 experiments in total equally distributed to each skill as follows:

Sl. No	Name of the exercise	Min. Exercises to be practiced / written in Record Note
<b>Listening Skill</b>		
1	Listening to Speeches by Great Speakers/ TV News	Each One exercise
2	Listening to Short Stories	Minimum of two exercises
3	Listening to Indian / British / American English	Minimum of two exercises
<b>Reading Skill</b>		
4	Reading Tongue Twisters	A list of 25 tongue twisters
5	Reading English Newspapers	Minimum 2 passages from any English Newspaper
6	Frequently mispronounced words	List of 25 words
<b>Speaking Skill</b>		
7	Making Polite Expressions	Polite expressions - Greeting, Requesting, Thanking, Apologizing, Opinions, Suggestions
8	Introducing oneself / friends/family	Minimum two exercises for introducing oneself and introducing others
9	Reciting quotes	Quotes of Leaders / Scholars / Scientists (List of 25 quotes)
10	Face to face conversation	Minimum two exercises
<b>Writing Skill</b>		
11	Use of Thought Fillers	A list of 25 frequently used thought fillers

12	Completing an Incomplete Story	Minimum of two exercises. (conclusion - minimum 3 lines, title & moral)
13	Non-Verbal Communication	A list of 10 questions and answers relating to non- verbal communication.

**Notes:**

1. Each experiment shall be awarded 20 marks and the total marks secured in all experiments shall be averaged to 20 marks.
2. Attendance mark shall be calculated for 5 marks as per the given norms.
3. Total internal mark is 25 (Record 20 marks + Attendance 5 marks).
4. Observation note is not applicable for this practical.
5. Listening skill exercises: For each exercise under Listening Skill, minimum exercise should be provided for practice and should be recorded in the record note.(as per the tabular column)

Open sources available online on the sites such as

[www.youtube.com](http://www.youtube.com), [www.letstalk.co.in](http://www.letstalk.co.in), <http://www.bbc.co.uk/learningenglish/english/features/6-minute-english>, and <https://esl-lab.com/>, can be utilized for sessions on improving listening skill.

# THIRD SEMESTER

## 6431 - C PROGRAMMING AND DATA STRUCTURES

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6431 C PROGRAMMING AND DATA STRUCTURES	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### DETAILED SYLLABUS

#### UNIT - I

#### PROGRAM DEVELOPMENT AND INTRODUCTION TO C

##### Chapter 1.1 Program:

**3 Hrs**

Program definition - program development cycle - algorithm - flow chart - symbols, importance and advantage of flow chart.

##### Chapter 1.2 Introduction to C:

**3 Hrs**

History of C - features of C language - structure of a C program - execution of C Program: Compiling, link and run a program - diagrammatic representation of program execution process.

##### Chapter 1.3 Variables, Constants and Data types:

**5 Hrs**

C character set - tokens - constants - keywords - identifiers and variables - data types and storage - data type qualifiers - declaration of variables - assigning values to variables - escape sequences - defining symbolic constants.

##### Chapter 1.4 C operators:

**5 Hrs**

Arithmetic, logical, assignment, relational, increment and decrement, conditional, bitwise, special operator precedence and associativity. C expressions - arithmetic expressions, evaluation of expressions - type cast operator.

##### Chapter 1.5 I/O statements:

**2 Hrs**

Formatted input, formatted output, unformatted I/O statements

#### UNIT - II

#### DECISION MAKING, ARRAYS, STRINGS AND FUNCTIONS

##### Chapter 2.1 Control Statements

**5 Hrs**



Simple if statement - if-else, else-if-ladder statements, switch statement, looping statements - while, do\_while and for loop, go to, continue and break statements.

**Chapter 2.2 Arrays** **4 Hrs**

Definition - array element and subscript - declaration - initialization of one dimension array elements - two dimensional arrays - initialization of elements.

**Chapter 2.3 Strings** **3 Hrs**

Introduction - declaring and initializing string variables, reading strings , writing strings, string handling functions - strlen() , strcpy() , strcmp() , strcat() and strrev() function.

**Chapter 2.4 Built in Functions** **3 Hrs**

Declaration and definition of function. math functions - console I/O functions - standard I/O functions - character oriented functions.

**Chapter 2.5 User Defined Functions** **3 Hrs**

Defining functions and needs - scope and life time of variables, function call, return values, recursion.

**UNIT - III**

**STRUCTURES, UNIONS AND POINTERS**

**Chapter 3.1: Structures and Unions** **7 Hrs**

Structure definition - variable declaration - initialization - accessing and giving values to structures, structures within structures, arrays within structures. unions: declaration - initialization - difference between union and structure.

**Chapter: 3.2: Pointers** **4 Hrs**

Introduction - advantages of pointers - accessing the address of a variable - declaring and initializing pointers - accessing a variable through its pointer - pointer expressions.

**Chapter: 3.3: Dynamic Memory Allocation** **3 Hrs**

Advantages - malloc(), calloc(), realloc() and free() functions.

**Chapter: 3.4: Command Line Arguments** **2 Hrs**

Introduction - argv and argc arguments.

**Chapter: 3.5: File Management** **2 Hrs**

Introduction - defining and opening a file, closing a file.

**UNIT - IV**

**INTRODUCTION TO DATA STRUCTURES, STACK AND QUEUES**

**Chapter 4.1: Introduction to Data Structures** **8 Hrs**

Introduction - data and information - elementary data structure organization - types of data structures - primitive and non primitive data structures, operations on data structures: traversing, inserting, deleting, searching, sorting, merging, different approaches to designing an algorithm: top-down approach, bottom-up approach (definition and examples only)

**Chapter: 4.2: Definition of a Stack** **5 Hrs**

Operations on stack (PUSH & POP) - implementation of stack through arrays - polish notations - conversion of infix to postfix expression.

**Chapter: 4.3: Queues** **5 Hrs**

Definition - representation of queue using arrays - circular queue, dequeue (definition and examples only)

**UNIT - V**

**LINKED LIST, TREES, SORTING AND SEARCHING**

**Chapter 5.1: Terminologies** **7 Hrs**

Node, address, pointer, information, null pointer, empty list - type of lists: singly linked list , doubly linked list, circular list - representation of singly linked lists in memory-difference between linked & sequential list - advantages and disadvantages of linked list. (concepts only, no implementations)

**Chapter: 5.2: Trees** **4 Hrs**

Terminologies: degree of a node, degree of a tree, level of a node, leaf node, depth / height of a tree, in-degree & out-degree, siblings. in order traversal, preorder traversal, post order traversal. (concepts only, no implementations)

**Chapter: 5.3: Sorting** **3 Hrs**

Introduction, types of sorting - bubble sort, quick sort - examples.

**Chapter: 5.4: Searching****3 Hrs**

Definition - algorithms and C programs for linear search and binary search.

**Text Books:**

1. Programming in ANSI C Prof. E. Balagurusamy Tata Mc-Graw Hill, New Delhi, 4th Edition

**Reference Books:**

1. A Text Book on C E. Karthikeyan PHI Private Limited, New Delhi
2. Programming with C Byron Gottfried. Schaum Series -TMGH
3. Programming and Problem solving using C ISRD Group, Lucknow Tata Mc-Graw Hill, New Delhi
4. Let us C Yashavent Kanethar BPB Publication, 2005, New Delhi
5. Introduction to Data structures with applications. Trembley and Sorenson Tata Mc-Graw Hill, New Delhi
6. Fundamentals of Data structures in C Horowitz , Sahni Anderson- Freed University Press, Hyderabad
7. Introduction to Data structures Bhagat Singh TMGH, New Delhi
8. Data Structures and Algorithms G.A. Vijayalakshmi Pai TMGH, New Delhi

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6432 - OPERATING SYSTEM**  
Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6432 OPERATING SYSTEM	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS****UNIT - I****INTRODUCTION TO OPERATING SYSTEMS****Chapter 1.1: Basics of Operating Systems****4 Hrs**

Definition - types of operating systems: mainframe, desktop, multiprocessor, distributed, clustered, multiprogramming, real time, embedded and timesharing, mobile OS (android, IOS).

**Chapter 1.2: Operating System Components****4 Hrs**

Process management component- memory management component - I/O management component - file management component-protection system - networking management component - command interpreter.

**Chapter 1.3: Operating System Services****4 Hrs**

Process execution - I/O operations - file manipulations - communications - error detection and recovery - resource allocation - accounting - system protection - system calls - system call execution.

**Chapter 1.4: Operating System Structures****3 Hrs**

Simple structure, layered, monolithic, microkernel operating systems - hybrid operating system - views - user, system view - concept of virtual machine - booting.

**Chapter 1.5: User Interface****3 Hrs**

Command Line Interface (CLI) based OS-DOS; Unix-Graphic User Interface (GUI) based OS - Windows, Linux - Difference between CLI and GUI.

**UNIT - II****PROCESS MANAGEMENT****Chapter 2.1: Processes****5 Hrs**

Definition - process relationship - process states - process state transitions - process control block - context switching - threads - concept of multithreads - benefits of threads - types of threads.

**Chapter 2.2: Process Scheduling****5 Hrs**

Definition - scheduling objectives - types of schedulers - scheduling criteria - CPU utilization, throughput, turnaround time, waiting time, response time (definition only) -scheduling algorithms - preemptive and non - pre emptive - FCFS - SJF – SRT – PS – RR – MQ - multiprocessor scheduling - types - performance evaluation of the scheduling.

**Chapter 2.3: Inter-process Communication and Synchronization**

**4 Hrs**

Definition - shared memory system - message passing - critical section - mutual exclusion - semaphores.

**Chapter 2.4: Deadlocks**

**4 Hrs**

Definition - deadlock characteristics - deadlock prevention - deadlock avoidance - deadlock detection and recovery.

**UNIT - III**

**MEMORY MANAGEMENT**

**Chapter 3.1: Basic Memory Management**

**6 Hrs**

Definition - logical and physical address map - memory allocation - contiguous memory allocation - partition allocation - single, fixed and variable partition - internal and external fragmentation and compaction - swapping - paging - principle of operation - page allocation - hardware support for paging - protection and sharing - disadvantages of paging.

**Chapter 3.2: Virtual Memory**

**6 Hrs**

Basics of virtual memory - hardware and control structures - locality of reference, page fault, working set, dirty page/dirty bit - demand paging, segmentation.

**Chapter 3.3: Page Replacement Algorithms**

**6 Hrs**

Optimal (opt), first in first out (FIFO), second chance (SC), not recently used (NRU) and least recently used (LRU), advantages and disadvantages of virtual machine.

**UNIT - IV**

**I/O AND FILE MANAGEMENT, SECURITY AND PROTECTION**

**Chapter 4.1: Disk Management**

**5 Hrs**

Disk structure - physical structure, logical structure, disk formatting, disk scheduling and its algorithms, RAID structure of disk, RAID levels 0-6.

**Chapter 4.2: File Management**

**5 Hrs**

File concept - file attributes - name, identifier, type, location, size, time, date, user identification - file operations - file system structure - byte sequence, record sequence and tree-based directory structure - single level, two levels, tree structured directory.

**Chapter 4.3: Access Methods**

**4 Hrs**

Sequential, random access - file allocation methods - contiguous, linked, and indexed.

**Chapter 4.4: Security and Protection**

**4 Hrs**

Security threats - security policies and mechanisms - authentications.

**UNIT - V**

**LINUX - CASE STUDY**

**Chapter 5.1: Introduction**

**5 Hrs**

History of linux - features of linux - components of linux system - user space - kernel space - linux architecture - popular flavors of linux - fsf/gnu - linux desktop - gnome - kde.

**Chapter 5.2: File System**

**4 Hrs**

Second extended file system - ext2 - virtual file system - different types of files - file management - file security - 3 levels - mounting file system - unmounting.

**Chapter 5.3: Managing Accounts**

**4 Hrs**

Types of accounts - root, system, user-manage users and groups - create, modify, delete a group - create, modify, delete an account.

**Chapter 5.4: Shell Programming**

**4 Hrs**

Linux shell - types - graphical, command line - characteristics of various shells - bash, Csh / Tcsh, Zsh, Fish - shell prompt - shell scripting - need for shell script - shell script advantages and disadvantages - script example - unix file structure - introduction to unix file system, inode (index node), file descriptors.

**Text Books:**

1. "Operating System Internal and Design Principles", William Stallings, Pearson Education, 7th Edition

**Reference Books**

1. "Operating System, Principles & Design", Pal Chaudhury, PHI Learning, First Edition

2. "Operating System concepts", Abraham Siberschatz Galvin, Gagne, Wiley Publishers, 9th Edition

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

# 6433 - COMPUTER HARDWARE AND SERVICING

## Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6433 COMPUTER HARDWARE AND SERVICING	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### DETAILED SYLLABUS

#### UNIT - I

##### MOTHERBOARD COMPONENTS

###### Chapter 1.1: Motherboard components

5 Hrs

Processor sockets/slots - memory sockets - chipsets - cache - bios - clock generator - rtc - super I/O controller - power connector - battery - keyboard/mouse connectors - jumpers - ports and headers - pin connectors - motherboard form factor - hardware, software and firmware.

###### Chapter 1.2: Computer Peripheral devices

2 Hrs

Internal and external devices.

###### Chapter 1.3: Processors

4 Hrs

Introduction - core2 duo processor, quad core processor, core i3, i5, i7 series, AMD AIO series, xeon processor.

###### Chapter 1.4: Chipsets

2 Hrs

Chipset basics - north / south bridge architecture and hub architecture.

###### Chapter 1.5: Bus Standards

2 Hrs

Overview and features of PCI, AGP, USB, & processor bus.

#### UNIT - II

##### MEMORY AND I/O DEVICES

###### Chapter 2.1: Primary and Secondary Memory:

3 Hrs

Introduction main memory - types - organization, access time, cycle time, and memory errors and error detection techniques. hard disk: introduction - construction - working principle - file systems - formatting and troubleshooting.

###### Chapter 2.2: Removable Storage and Special Devices:

3 Hrs

DVD-ROM - recordable DVD rewritable DVD. Blu-ray: Introduction - Blu-ray disc Parameters - recording and playback principles. special drives: external drives, Memory stick, USB flash drive, solid state drive. data recovery tools - DOS, and Third party tools.

###### Chapter 2.3: Keyboard and Mouse:

3 Hrs

Keyboard: interfacing and signals (USB, wireless), types of keys, keyboard matrix, key bouncing, types of keyboard (simple, mechanical). mouse - optical mouse operation - optical mouse cleaning - troubleshooting flowchart for a mouse.

###### Chapter 2.4: Printers and Scanners:

3 Hrs

Printer - Introduction types of printers - dot matrix, inkjet, laser, thermal, MFP printer (multi-function printer) - operation and troubleshooting. scanner - introduction, scanner mechanism, working principle - types of scanners (barcode, handheld, flatbed) - preventive maintenance, and troubleshooting tools.

###### Chapter 2.5: Special I/O Devices

3 Hrs

Trackball, touch pad, pointing stick, joystick, light pen, graphic tablet, camera, bar-code reader, RFID reader

#### UNIT - III

##### DISPLAY, POWER SUPPLY AND BIOS

###### Chapter 3.1: Displays and Graphic Cards

4 Hrs

Displays: LCD Principles - plasma displays - TFT displays - LED displays. graphic cards - video capture card - troubleshoot display and graphics card problems

###### Chapter 3.2: SMPS

4 Hrs

Block diagram basic principles and operations o/p voltage - cable color code - connectors and power good - common failures (no circuit diagram to be discussed)

### **Chapter 3.3: BIOS**

**4 Hrs**

BIOS functions - cold and warm booting - bios error codes - bios interrupts - bios advanced setup. upgrading bios, flash bios setup. identification of different bios (AMI, AWARD BIOS).

### **Chapter 3.4: POST**

**3 Hrs**

Error, beep codes, error messages, post - faults related to hardware.

## **UNIT - IV**

### **DESKTOP, LAPTOP, MOBILE AND TABLET PC**

#### **Chapter 4.1: Upgrading of Systems**

**3 Hrs**

Hardware up-gradation. updating of system & application software: device driver - OS update and firewall security - control panel - installed devices and properties - install procedure, rollback or un- install procedure, tests of various device driver software.

#### **Chapter 4.2: Installation and Troubleshooting**

**3 Hrs**

Formatting, partitioning and installation of OS - trouble shooting laptop and desktop computer problems -antivirus and application software installation - backup and restore procedure - recovery software.

#### **Chapter 4.3: Laptop**

**3 Hrs**

Difference between laptop and desktop - types of laptop - working principles-configuring laptops and power settings - upgrade RAM, hard disk, replacing battery - configuration of camera, mic, WLAN, bluetooth, touchpad laptop and keyboard.

#### **Chapter 4.4: Mobile phone**

**3 Hrs**

Basics of mobile communication, battery – antenna - ear piece- microphone - speaker- buzzer – LCD - keyboard. basic circuit board components - names and functions of different ics used in mobile phones. installation & troubleshooting: mobile servicing kit, assembling and disassembling of different types of mobile phones - installation of OS - fault finding & troubleshooting - software and antivirus: flashing - formatting - downloading - mobile viruses - antivirus software.

#### **Chapter 4.5: Introduction to Tablet PC**

**3 Hrs**

Digitizers versus touch-screen displays, merits and demerits. comparisons: laptops, desktops, pocket pc, other PDAs, other pen- based computers, differences in hardware. windows XP tablet pc edition configuration: basic interface settings, screen settings, display properties, other settings and options.

## **UNIT -V**

### **FUTURE HARDWARE SYSTEMS**

#### **Chapter 5.1: Moore's law & NVM Technology**

**4 Hrs**

Calculating the Hardware Growth using Moore's Law, Introduction to Non Volatile Memory Technology, - Architecture of NVM technology - Advantages and Scope of NVM Technology.

#### **Chapter 5.2: Emerging Non Volatile Memory Technologies**

**3 Hrs**

(Concepts only)- magnetic random access memory (mram), spin transfer torque random access memory (stt-ram) - ferroelectric random access memory (feram), phase change memory (pcm) and resistive random-access memory (rram).

#### **Chapter 5.3: Introduction to Advanced Network technologies**

**3 Hrs**

Remote Direct Memory Access (RDMA) - working principle of RDMA - limitations and challenges in RDMA technology.

#### **Chapter 5.4: Embedded Systems**

**3 Hrs**

Basic concepts - Embedded Board and the Von Neumann Model - Basic Electronics of Embedded devices - AC Circuits, DC Circuits and Active Devices - Power supply- Scope, Control and Probes - Advantages and Applications of Embedded devices.

### **Text Books:**

1.Computer Installation and Servicing, D.Balasubramanian, Tata Mc-Graw Hill, New Delhi., Second Edition

### **Reference Books**

1.Troubleshooting, Maintaining and Repairing PCs, Stephen J.Bigelow, TMH, New Delhi, Fifth Edition

2. PC Hardware in a nutshell , Robert Bruce Thompson, O'Reilly Media , Third India Reprint 2008.

3.The Cell Phone Handbook, P.J. Stetz and Penelo e Stetz, Find Tech Ltd, Second Edition,New Delhi.

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

## 6434 - C PROGRAMMING AND DATA STRUCTURES PRACTICAL

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
<b>6434 C PROGRAMMING AND DATA STRUCTURES PRACTICAL</b>	Hrs / Week	Hrs / Sem	Marks			Duration
	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
				25	100	100

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### EXERCISES

#### PART - A

**40 Hrs**

1. Write a simple C Program
  - (a). Print your Name and Address.
  - (b). Find Simple interest and Compound interest.
2. Write a C program to swap two variable's using
  - (i). third variable and (ii) without using a third variable.
3. Write a program to find the largest number between given three numbers.
4. Write a program to print all prime numbers from 1 to N.
5. Write a program to prepare the total marks for N students by reading the Reg.No, Name, Mark1 to Mark6 by using array of structures.
6. Write a program using the function power (a,b) to calculate the value of a raised to b.
7. Write a program to find the length of the given string using pointers.
8. Write a program to find factorial of a number using recursion.

#### PART – B

**40 Hrs**

9. Write a program in C to create a singly linked list containing at least five elements. Make necessary assumptions.
10. Write a C program to perform operations in stack using array.
11. Write a C program to convert an infix expression into post fix expression.
12. Write a C program to perform operations in queue using array.
13. Write a C program to add two 3 x 3 matrices and display the result in Matrix form.
14. Write a C program to read 10 elements and sort the above numbers using bubble sort.
15. Write a C Program for binary searching.

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

### DETAILED ALLOCATION OF MARKS

Allocation	Max. Marks
Writing any one program from Part - A	20 Marks
Writing any one program from Part - B	25 Marks
Executing program (Part - A)	20 Marks
Executing program (Part - B)	20 Marks
Result with printout ( Part - A)	05 Marks
Result with printout ( Part - B)	05 Marks
Viva - voce	05 Marks
<b>Total</b>	<b>100 Marks</b>

## 6435 - LINUX PRACTICAL

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION	EXAMINATION
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6435 LINUX PRACTICAL	Hrs / Week	Hrs / Sem	Marks			Duration
	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
					25	100

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

## DETAILED SYLLABUS

### UNIT - I

**Basics of Linux OS:** Entering and exiting from a linux system - user accounts - general understanding of various application programs - different shells

### UNIT - II

**Linux Commands:** Learn the syntax and usage of - directory management commands - file management commands - general purpose commands - simple filters - advanced filters - communication commands - check the process status - process management commands - search patterns - exercises.

### UNIT - III

**Text Editor:** File operations (New, Open, Close, Save, Save and Exit, Print) - Text Editing operations (Inserting, deleting, finding, replacing, copying and moving).

### UNIT - IV

**Shell Scripts:** Use of shell scripts - Numerical operations - Looping- Swapping Technique - String operations -Using Command line arguments - Filters - Date Functions - Relational operations- Logical operations - Boolean operations - Basic arithmetic operations - Case statement - Search Directory or File - Exercises.

## EXERCISES

### PART - A LINUX COMMANDS

36 Hrs

**Write down the syntax and usage of the following exercise with all options. Check the commands with the system**

- Usage of Directory Management commands: ls, cd, pwd, mkdir, rmdir
- Usage of File Management commands: cat, chmod, cp, mv, rm, more
- Use the General Purpose commands: wc, cal, date, who, tty, ln
- Using the Simple filters: pr, head, tail, cut, paste, nl, sort
- Advanced filters : Search for a pattern using grep, egrep, fgrep, uniq  
Communication Commands: write, wall
- Check the details of process name, PID, status using ps command. Process Management commands: &, nohup, kill, nice
- Device pattern using meta character to match each of the following situation:
  - All three character filenames.
  - All filenames that contains the characters 'a' or 'b' or 'c'.
  - All filenames beginning with a particular string.
  - All filenames beginning with 'ca' and ending with two digits.
  - All filenames beginning with 's' and having 'a' at somewhere.

### PART - B SHELL SCRIPTS

44 Hrs

- Write a shell script that accepts a numerical value N. Then display the decrementing value of N till it reaches 0.
- Write a shell script to search a string and display it.
- Write a shell script that takes three command line arguments. The first argument is the name of the destination file and the other two arguments are names of files to be placed in the destination file.
- Write a shell script to print contents of file from given line number to next given number of lines.
- Write a shell script that print out date information in this order: time, day of The week, day number, year- that is like this.21:18:00 IST Mon16 Aug2021
- Develop a Basic math Calculator using case statement.
- Write a shell script that presents a multiple choice question, gets the user's answer and report back whether the answer is right, wrong or not one of the choices.
- Write a shell script that takes a command line argument and reports on Whether it is a

directory, a file or something else.

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

**DETAILED ALLOCATION OF MARKS**

Allocation	Max. Marks
Correctness of Commands in Part-A	20 Marks
Execution of Commands in Part-A	20 Marks
Writing program in Part-B	20 Marks
Execution of program in Part-B	25 Marks
Printed Output (Part-A)	05 Marks
Printed Output (Part-B)	05 Marks
Viva- Voce	05 Marks
<b>Total</b>	<b>100 Marks</b>

**6436 - COMPUTER HARDWARE AND NETWORKING PRACTICAL**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
<b>6436 COMPUTER HARDWARE AND NETWORKING PRACTICAL</b>	4 Hrs	64 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**EXERCISES**

**PART - A**

**32 Hrs**

1. HARD DISK
  - a. Install Hard Disk.
  - b. Configure CMOS-Setup.
  - c. Partition and Format Hard Disk.
  - d. Identify Master /Slave / IDE Devices.
  - e. Practice with Scan disk, Disk cleanup, Disk De-fragmentation, Virus Detecting and Rectifying Software.
  - f. Creating System restore points in windows for system recovery.
2.
  - a. Install and Configure a DVD Writer or Blu-ray Disc Writer.
  - b. Recording a Blank DVD or Blu-ray Disc.
3. Printer Installation and Servicing
  - a. Install and configure Dot matrix printer, Ink jet and Laser printer.
  - b. Troubleshoot the above printers
4. Install and configure Scanner, Web cam, and Bio-metric device with system and trouble-shoot the problems.
5. Do the following cabling works in a network
  - a. Cable Crimping
  - b. Standard Cabling
  - c. Cross Cabling
  - d. Testing the Crimped cable using a Cable tester
6.
  - a. Configure Host IP, Subnet Mask and Default Gateway in a system inLAN (TCP/IP Configuration).
  - b. Configure Internet connection and use IPCONFIG, PING / Tracert and Netstat utilities to Debug the Network issues.
7.
  - a. Install and configure Network Devices: HUB, Switch and Routers



- b. Install and Configure Wired and Wireless NIC and transfer files between systems
8. a. Transfer files between systems in LAN using FTP Configuration.  
b. Install a Printer in LAN and share it in the network.

**PART – B****32 Hrs**

1. Installation of Windows 2008 / 2013 Server
2. Installation and configuration of DHCP Server
3. Installation and configuration of Mail Server
4. Installation and configuration of Active directory Services. Create a user and permission using logon script and group permissions.
5. Installation and configuration of DNS Server
6. a. Installation of Red Hat Linux using graphical mode.  
b. Installation of Red Hat Linux using VMware.
7. Installation of various open source packet sniffing tools & inspect packets in linux

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

**DETAILED ALLOCATION OF MARKS**

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result(Part - A)	05 Marks
Result(Part - B)	05 Marks
Viva - voce	05 Marks
<b>Total</b>	<b>100 Marks</b>

**6437 - E PUBLISHING PRACTICAL****Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6437 E PUBLISHING PRACTICAL	4 Hrs	64 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**EXERCISES****PART - A****32 Hrs**

1. Create a Bit Notice with specified height and width with various text styles.
2. Create a design using all basic tools and make changes using shape tool.
3. Create a notebook wrapper design using fountain filling and pattern filling tools.
4. Create an invitation using arrange menu commands like transformations, align and distribute, and order.
5. Create a calendar with the help of Grid Tool, Power clip and Import commands.
6. Create a simple logo using text tool, rectangle tool and ellipse tool.
7. Transform one object into another object using blend tool.

**PART - B****32 Hrs**

8. Create a design by using the various Selection Tools, cutting and pasting the images.
9. Using multiple layers, create a design with the use of masking various images.
10. Create a design by the use of text tools and apply text effects.
11. Change the color of an image by the use of selective coloring method.

12. Create a design by applying the various filtering effects.
13. Create a simple layout and master page by using master page palette and character styles.
14. Create a multipage document by using character, paragraph, auto-flow and text wrap commands.
15. Create a stylish monthly calendar sheet by using table and its formatting commands.

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

### **DETAILED ALLOCATION OF MARKS**

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

## **FOURTH SEMESTER**

### **6441 - PYTHON PROGRAMMING** Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
<b>6441 PYTHON PROGRAMMING</b>	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### **DETAILED SYLLABUS**

#### **UNIT - I**

#### **INTRODUCTION TO PYTHON**

##### **Chapter 1.1 Features of Python**

**5 Hrs**

Installing and running python - interpreter and interactive mode - identifiers - reserved keywords - variables - comments in python

##### **Chapter 1.2 Data Types**

**5 Hrs**

Numeric, string, list, sets, tuple, dictionary, boolean operators - arithmetic, relational, assignment, logical, bitwise, membership operator, identity operator.

##### **Chapter 1.3 Statements and Expressions**

**5 Hrs**

String operations; boolean expressions, data type conversion, type coercion; input from keyboard - input function, raw input function, mutable and immutable objects; illustrative programs.

#### **UNIT - II**

#### **DECISION MAKING, CONTROL STRUCTURE AND FUNCTIONS**

##### **Chapter 2.1 Decision Making**

**5 Hrs**

Simple if, if...else and if...elif statement; control statement - for loop, range(), while, break, continue, pass.

##### **Chapter 2.2 Functions**

**5 Hrs**

Built in functions-Mathematical functions, date and time, dir(), help() functions; user defined functions - return values, parameters and arguments, function calls, local and global scope, function composition, recursion, anonymous functions.

**Chapter 2.3 Writing Scripts in Python**

**5 Hrs**

Illustrative programs.

**UNIT - III**

**STRINGS AND LISTS**

**Chapter 3.1 Strings in python**

**5 Hrs**

String functions and methods, string slicing, immutable property, string traversal, escape characters, string formatting operators and functions.

**Chapter 3.2 Lists**

**5 Hrs**

Creation of List, values and accessing elements, mutable property, Traversing a List, copying the list, altering values, deleting elements from list.

**Chapter 3.3 Built-in List operators and built-in methods**

**5 Hrs**

Illustrative Programs

**UNIT - IV**

**TUPLES AND DICTIONARIES**

**Chapter 4.1 Tuples**

**8 Hrs**

Creating, accessing values, immutable property, assignment of tuples, returning tuples, tuples as arguments - variable length arguments - basic tuple operations, Built-in tuple functions.

**Chapter 4.2 Dictionaries**

**7 Hrs**

Creating a dictionary, accessing values, updating dictionary, deleting elements from dictionary; dictionary keys - properties, operations in dictionary, built-in dictionary methods - illustrative programs.

**UNIT -V**

**FILES AND EXCEPTION HANDLING**

**Chapter 5.1 File Handling**

**6 Hrs**

Text files, opening a file, closing a file, reading from a file and writing into a file, file opening modes, closing a file, file object attributes, file positions, renaming, deleting a file and files related methods.

**Chapter 5.2 Directory methods**

**2 Hrs**

mkdir(), chdir(), getcwd(), rmdir().

**Chapter 5.3 Exceptions in Python**

**5 Hrs**

Definition - built-in exceptions, handling exceptions-try except - except with no exception, except with multiple exceptions. try...finally; User defined exceptions. - Illustrative programs python - date & time - getting current time-formatted time - calendar for a month.

**Text Books:**

1. Introduction to Computing & Problem Solving using Python Materials, E.Balagurusamy, McGraw Hill Education(India) Pvt. Ltd , 1<sup>st</sup> Edition / 2016

**Reference Books:**

1. Learning Python Programming of Materials, Jeffrey Elkner, Allan B. Downey, Chris Meyers Samurai Media Limited,2016
2. Taming Python By Programming, Jeeva Jose, Khanna Book Publishing Co(P) Ltd, 2017
3. Python Programming, Ashok Namdev Kamthane and Amit Ashok Kamthane, McGraw Hill,2018
4. Learn and Practice Python programming, Swapnil Saurav, Eka Publishers, 2nd Edition/ 2020
5. Programming in Python, Dr.Pooja Sharma, BPB Publications,2017

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6442 - RELATIONAL DATABASE MANAGEMENT SYSTEMS**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION	
	Hrs / Week	Hrs / Sem	Marks	Duration
6442				

<b>RELATIONAL DATABASE MANAGEMENT SYSTEMS</b>	5 Hrs	80 Hrs	<b>Internal Assessment</b>	<b>External Exam*</b>	<b>Total</b>	
			25	100	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### **DETAILED SYLLABUS**

#### **UNIT - I**

##### **CONCEPTS OF DATABASES AND DATA MODELING**

###### **Chapter 1.1 Basic Concepts 4 Hrs**

Data, databases, database management system - components of database - data dictionary - architecture: overall architecture of DBMS - three level architecture.

###### **Chapter 1.2 Data Model 3 Hrs**

Types of database models: hierarchical database model, network database model and relational database model. E-R model: entities - attributes - relationships - E-R diagram - samples.

###### **Chapter 1.3 Database Administrator 3 Hrs**

Server / client and distributed concept - DBA tasks - DBA Tools/Utilities-database maintenance - backup & recovery.

###### **Chapter 1.4 Advanced Concepts 5 Hrs**

Introduction to data warehousing and data mining - applications - data marts. big data: definition - characteristics - various technologies used- applications - overview of NoSQL: difference between RDBMS and NoSQL - tools used in big data, scalability, and understanding storage architecture.

#### **UNIT - II**

##### **RELATIONAL DATA MODEL AND MYSQL ADMINISTRATION**

###### **Chapter 2.1 Relational data model 5 Hrs**

CODD's rules - components of DBMS - table structure - records, rows, tuples, attributes. keys: primary key, foreign key, composite key. meta data - data dictionary - data integrity - data constraints and validation - types of constraints - difference between SQL and MySQL.

###### **Chapter 2.2 Normalization 3 Hrs**

Benefits - normal forms: 1st normal form, 2nd normal form, 3rd normal form.

###### **Chapter 2.3 MySQL Installation: 3 Hrs**

Install, configure and test the MySQL server on microsoft windows.

###### **Chapter 2.4 Working with MySQL Admin: 4 Hrs**

Creating (CREATE cmd), Selecting (USE cmd) and Describing database(DESC cmd) - SHOW cmd - backing up databases

#### **UNIT - III**

##### **INTERACTIVE MYSQL**

###### **Chapter 3.1 Introduction to MySQL 4 Hrs**

MySQL data types - data definition commands - data manipulation commands - data retrieval commands.

###### **Chapter 3.2 MySQL Operators and Expressions: 2 Hrs**

Types of operators - arithmetic, comparison and logical operators - pattern matching - import and export of data.

###### **Chapter 3.3 Built-in Functions 3 Hrs**

Single row functions - aggregate functions - conversion functions

###### **Chapter 3.4 Querying the table 3 Hrs**

Selecting rows using where, order by, group by & having clauses sub queries - correlated sub-queries

###### **Chapter 3.5 Flow control 3 Hrs**

If(), If Null(), case, loop, leave, iterate, repeat, while

#### **UNIT - IV**

##### **MYSQL PERFORMANCE TUNING**

###### **Chapter 4.1 Indexes and sequences 4 Hrs**

Index types, creating of an index: simple and composite index, dropping index. sequences: creating, altering and dropping sequences.

###### **Chapter 4.2 Views 3 Hrs**

Introduction - advantages of views - creating, updating and deleting views.

**Chapter 4.3 Joins and Unions:** **4 Hrs**

Joins - definition - types of joins: natural join, inner join, self join outer join. unions: types: union, union all, union distinct - order by and limit handling.

**Chapter 4.4 User and Transaction management:** **4 Hrs**

Creating, deleting, renaming users grant & revoke commands -Transaction command: commit, rollback and save points. - ACID Properties.

**UNIT - V**

**STORED PROGRAM CONCEPTS AND DEVELOPMENT**

**Chapter 5.1 MySQL Procedures and Functions** **3 Hrs**

Creating - executing and deleting stored procedures - creating - executing and deleting stored functions - advantages.

**Chapter 5.2 MySQL Trigger and Cursor** **3 Hrs**

Use of trigger - creating trigger - types of triggers - cursor: creation and deletion.

**Chapter 5.3 MySQL and Web** **3 Hrs**

Need for own MySQL programs - MySQL application programming interfaces.

**Chapter 5.4 MySQL with PHP** **4 Hrs**

Database connections - managing database connections - performing queries - closing connections.

**Text Books:**

1. Database System Concepts, Abraham Silberschatz, Henry F.Forth, S.Sudarshan McGraw Hill Education. Seventh Edition

**Reference Books:**

1. Murach's MySQL ,Joel Murach, Mike Murach & Associates, Inc. 3rd Edition.
2. The Complete Reference MySQL ,Vikram Vaswami. MySQL Developers library, Paul DuBois,

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6443 - BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6443 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS**

**UNIT - I**

**AC FUNDAMENTALS, BATTERIES AND UPS**

**Chapter 1.1 AC Fundamentals** **4 Hrs**

Difference between AC and DC - advantages of AC over DC - waveform of sinusoidal A.C. cycle - generation of single phase A.C. by elementary alternator - definition of cycle, frequency, time period, amplitude, peak value, average value and RMS value - define peak factor and form factor -concept of phase, phase difference and phase angle - single phase and 3 phase (definition) - meaning of lagging and leading sine wave - advantages of three phase over single phase.

**Chapter 1.2 Batteries** **4 Hrs**

Classification of cells - construction of lead acid cell - methods of charging - care and maintenance of lead acid battery - indications of a fully charged battery - maintenance free batteries.

**Chapter 1.3 UPS** **4 Hrs**

Need for UPS - online and offline UPS - definition - block diagram - explanation of each block - merits and demerits of online and offline UPS - need of heat sink - specification and ratings - maintenance of UPS including batteries.

**Chapter 1.4 Switches** **3 Hrs**

Basics of switches used - ratings of switches used for a system installation - ratings and types of wires used - necessity of MCB, ELCB.

## UNIT II

### TRANSFORMER AND SPECIAL MOTORS

#### Chapter 2.1 Single Phase transformer

5 Hrs

Working principle and construction of transformer - brief description of each part - function and materials used - emf equation of transformer (no derivation) - voltage and current ratio of a transformer - efficiency - losses in a transformer - auto transformer - applications - step up and step down transformer (definition only)

#### Chapter 2.2 Special Motors

5 Hrs

Stepper motor: definition - working principle - types and applications - servo motors: definition - working principle - types and applications - factors to be considered for selecting a motor for a particular application.

#### Chapter 2.3 Electrical Safety

5 Hrs

Electric shock - need for earthing - types of earthing, fuses - need - types of fuses.

## UNIT - III

### SEMI CONDUCTOR DEVICES

#### Chapter 3.1 Diodes

8 Hrs

PN Junction diode - barrier voltage, depletion region - forward biased and reverse biased junction - working principle - forward / reverse characteristics of P-N junction diode - applications of diode - zener diode: construction - characteristics (forward and reverse) - avalanche and zener break down - applications of zener diode. light emitting diodes - operation, construction and characteristics. LDR - principle of operation and characteristics. photo diode - principle of operation (concept only).

#### Chapter 3.2 Rectifiers

4 Hrs

Definition - need of rectification - circuit diagram, operation, i/p and o/p waveforms of half wave - full wave- bridge rectifiers (without filters) - uses of filters in rectifier circuit - ripple factor, efficiency and PIV ( no derivation) – comparison.

#### Chapter 3.3 Bipolar Junction Transistor

3 Hrs

Definition - principle of NPN and PNP transistor - symbol - transistor terminals - operating principle (NPN transistor only) - configurations of transistor.

## UNIT - IV

### BOOLEAN ALGEBRA, LOGIC GATES COMBINATIONAL SYSTEM

#### Chapter 4.1 Number representation

4 Hrs

Decimal, binary, octal and hexa-decimal number systems -conversion of number from one number system to another (without decimal point) - BCD code - ASCII codes - parity bit - use of a parity bit -odd parity and even parity.

#### Chapter 4.2 Logic gates

3 Hrs

Positive and negative logic system - definition, truth table, symbol and logical equations of AND - OR - NOT - EXOR - EXNOR (Only 2 - inputs) gates - universal gates - NAND - NOR-symbol and truth table.

#### Chapter 4.3 Boolean Algebra

3 Hrs

Basic laws of boolean algebra – demorgan's theorem and proofs - duality theorem - simplification of logical equations using boolean laws - two and three variable karnaugh map.

#### Chapter 4.4 Arithmetic Circuits

3 Hrs

Half adder and full adder - truth table, circuit diagram - half subtractor and full subtractor - truth table, circuit diagram.

#### Chapter 4.5 Combinational logic circuits

2 Hrs

Parity generator and checker - multiplexer - de-multiplexer - encoder - decoder (definition and basic circuits only) - comparator circuit for two three bit words.

## UNIT - V

### SEQUENTIAL LOGIC SYSTEM

#### Chapter 5.1 Flip flops

5 Hrs

Basic principle of operation - S-R, D flip-flop - Operation and truth table -Race Condition - JK flip flop -T flip flop - Toggling - Edge Triggered Flip-flop - Level Triggered flip flop - J-K Master Slave flip flop.

**Chapter 5.2 Counters**

**4 Hrs**

Need -types of counters - 4 bit asynchronous counter - mod n counter - decade counter - 4 bit synchronous counter -distinguish between synchronous and asynchronous counter -application of counters

**Chapter 5.3 Registers**

**4 Hrs**

Shift register - block diagram representation and wave form of serial - in serial - out, serial - in parallel - out, parallel - in serial - out, parallel - in - parallel - out - applications of shift registers.

**Text Books:**

1. Electrical Technology Vol I and II - B.L.Theraja - S.Chand & Co, NewDelhi FirstEdition,2012
2. Modern Digital Electronics - R.P.Jain - Tata Mc-Graw Hill, New Delhi 2010
3. Principles of Digital Electronics - K.Meena - PHI learning Private Ltd - 2009

**Reference Books:**

1. Digital Electronics and Logic Design - Jaydeep Chakravarthy - University Press, Hyderabad
2. Basic Electrical Engineering - V.N.Mittle - Tata Mc-Graw Hill, New Delhi - First Edition
3. Basic Electrical and Electronics Engineering - R,Muthu Subramanian, R.Salivajanan - Tata Mc-Graw
4. Principles of Electronics - V.K.Mehta - S.Chand & Co, New Delhi - Second Edition
5. Digital Electronics - G.K.Kharate - Oxford University press - 2010

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6444 - SOFTWARE ENGINEERING**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6444 SOFTWARE ENGINEERING	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS**

**UNIT - I**

**INTRODUCTION TO SOFTWARE ENGINEERING**

**Chapter 1.1 Basics of Software Engineering**

**3 Hrs**

Need for software engineering - definition - software characteristics - software myths - program versus software products

**Chapter 1.2 Software Development Life Cycle Models**

**6 Hrs**

Introduction - waterfall model - prototyping model - spiral model- iterative enhancement model – agile model - object oriented model- advantages and disadvantages of above models - comparison of various models.

**Chapter 1.3 Software Requirement Analysis (SRS)**

**6 Hrs**

Value of good SRS-developing SRS from business requirements- requirement process-requirement specification - desirable characteristics of an SRS-components of an SRS-structures of a requirements documents-requirements gathering- creating a backlog in agile model.

**UNIT - II**

**SOFTWARE DESIGN AND PLANNING**

**Chapter 2.1 Software Design**

**4 Hrs**

Definition of software design - objectives of software design - process of software design - architectural design - modular design - structure chart - coupling and cohesion - different types - interface design - design of human computer interface

**Chapter 2.2 Coding**

**4 Hrs**

Information hiding -programming style - internal documentation - monitoring and control for coding -structured programming- error / exception handling-executing sprints for agile model. scrum meetings in agile - importance of code reviews and unit testing

**Chapter 2.3 Software Planning**

**4 Hrs**

Software metrics - definition - types of metrics - product and product metrics-relevant metrics in agile-function point and feature point metrics - software project estimation - steps for

estimation - reason for poor and inaccurate estimation - project estimation guidelines - models for estimation - COCOMO model - automated tools for estimation - sprint planning in agile.

### **Chapter 2.4 CASE**

**3 Hrs**

CASE and its scope- architecture of case environment - building blocks for case - CASE support in software life cycle - objectives of CASE - characteristics of CASE tools - list of case tools - categories, advantages and disadvantages of CASE tools.

## **UNIT - III**

### **SOFTWARE MAINTENANCE AND RISK MANAGEMENT**

#### **Chapter 3.1 Software Maintenance**

**5 Hrs**

Software as an evolution entity - software configuration management activities - change control process - software version control - software configuration management - need for maintenance - categories of maintenance - maintenance cost -factors affecting the effort

#### **Chapter 3.2 Risk management**

**5 Hrs**

Definition of risk - basics for different types of software risks - monitoring of risks - risk management - risk avoidance - risk detection - risk control - risk recovery - sources of risks - types of risks

#### **Chapter 3.3 Project scheduling**

**5 Hrs**

Introduction - factors affecting the task set for the project - scheduling methods - work breakdown structure - flow graph - gant chart - pert - setting up sprint burn down charts for agile model

## **UNIT - IV**

### **SOFTWARE TESTING**

#### **Chapter 4.1 Software Testing**

**3 Hrs**

Introduction to testing - testing principles - testing objectives - basic terms used in testing - fault - error - failure - test cases - black box and white box testing - advantages and disadvantages of above testing - methods for block box testing strategies - methods for white box testing strategies - testing activities - test plan - tracking defects

#### **Chapter 4.2 Levels of testing**

**3 Hrs**

Integration tests - system testing - types.

#### **Chapter 4.3 Software Testing Strategies**

**3 Hrs**

Static testing strategies - formal technical reviews - code walkthrough – code inspection - debugging- definition - characteristics of bugs - life cycle of a debugging task debugging approaches.

#### **Chapter 4.4 Software Testing Tools**

**3 Hrs**

Need for tools - classification of tools - functional/regression testing tools performance/load testing tools -testing process management tools - benefits of tools - risk associated with tools - selecting tools - introducing the tool in the testing process - different categories of tools - examples for commercial software testing tool. - test plan, test case design,

#### **Chapter 4.5 Code of Ethics for Software Professionals**

**3 Hrs**

Human ethics -professional ethics - ethical issues in software engineering - code of ethics and professional practice: software engineering code of ethics and professional practice - ethical issues: right versus wrong

## **UNIT - V**

### **SOFTWARE RELIABILITY AND QUALITY ASSURANCE**

#### **Chapter 5.1 Software Quality Assurance**

**5 Hrs**

Verification and validation - SQA - objectives and goals - SQA plan - definition of software quality - classification of software qualities - software quality attributes - important qualities of software products - importance of software quality -SEI - CMM - five levels - ISO 9000 - need for ISO certification - benefits of ISO 9000 certification - limitation of ISO 9000 certification - uses of ISO - salient features of ISO 9000 requirements - introduction to ISO 9126

#### **Chapter 5.2 Software Reliability**

**3 Hrs**

Definition - reliability terminologies - classification of failures - reliability metrics - reliability growth modeling - reliability measurement process

#### **Chapter 5.3 Reverse Software Engineering**

**5 Hrs**



Definition - purpose - reverse engineering process - reverse engineering tasks - characteristics and application areas of reverse engineering - software re- engineering - principle - re-engineering process - difference between forward engineering and re-engineering.

**Text Books:**

1. Software Engineering , Ian Sommerville , Pearson Education, Sixth Edition.

**Reference Books:**

1. Fundamentals of Software Engineering, Rajib Mall, PHI Learning Pvt Limited, New Delhi, 28th Printing
2. Software Engineering, Bharat Bhusan Agarwal, Sumit Prakash Tayal, Firewall Media, New Delhi,
3. Software Testing, K.Mustafa and R.A.Khan, Narosa Publishing House, New Delhi, Reprint 2009
4. Software Quality, R.A. Khan, K.Mustafa and SI, Narosa Publishing House, New Delhi, Reprint 2008
5. Software Engineering, Stephen Schach, TMGH Education Pvt Ltd, New Delhi, Eight Reprint 2011.
6. Software Engineering fundamentals, Ali Behforooz and Fredick J Hudson, Oxford University,2005.
7. Software Testing Concepts and Tools, Nageshwara Rao Pusulri, DreamTeach, First Edition
8. Software Engineering Concepts and application, Subhasjit Dattun, OXFORD University Press, 2010

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6445 - PYTHON PROGRAMMING PRACTICAL**  
Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6445 PYTHON PROGRAMMING PRACTICAL	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**PART - A**

**40 Hrs**

1. i). Write a Python program to compute GCD of two numbers.  
ii). Write a Python Program to print prime numbers in the given range.
2. i). Write a Python Program to check the given year is leap year or not.  
ii). Write a Python Program to print Armstrong numbers between given range.
3. i). Write a Python Program to do basic trim and slice operations on String.  
ii). Write a Python Program to accept line of text and find the number of characters, vowels and blank spaces on it.
4. i). Write a Python Program using function to display all such numbers which is divisible by 3 but are not multiple of 5 in a given range.  
ii). Write a Python Program using recursion to print 'n' terms in Fibonacci series.
5. Write a Python Program to add 'ing' at the end of a given string if the string has 3 or more characters . If the given string is already ends with 'ing'then add 'ly'instead. If the string has less than 3 characters, leave it unchanged.
6. Write a Python program to find minimum and maximum of a list of numbers
7. Write a Python program to display a list in reverse order.
8. Write a Python Program to print the first half values of tuple in one line and last half values in next line.

**PART - B**

**40 Hrs**

9. Write a Python Program to take a list of words and return the length of the longest one using string.
10. Write a Python Program to find an element in a given set of elements using Linear Search
11. Write a Python Program to sort a set of elements using Selection sort.
12. Write a Python Program to multiply two matrices.
13. Write a Python program to demonstrate different operations on Tuple.
14. Write a Python Program to demonstrate to use Dictionary and related functions.
15. Write a Python Program to copy file contents from one file to another and display number of

words copied

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation.

### DETAILED ALLOCATION OF MARKS

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

## 6446 - RELATIONAL DATABASE MANAGEMENT SYSTEMS PRACTICAL

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
<b>6446 RELATIONAL DATABASE MANAGEMENT SYSTEMS PRACTICAL</b>	Hrs / Week	Hrs / Sem	Marks			Duration
	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
					25	100

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### EXERCISES

#### PART - A

**40 Hrs**

1. Install, configure and connect to MySQL server and MySQL workbench in windows.  
Create a database, backup and restore the database.
2. To study Basic MySQL commands (create database, create table, use, drop, insert) and execute the following queries using these commands:
  - Create a database named `_employee`.
  - Use the database `'employee'` and create a table `'emp'` with attributes `'ename'`, `'ecity'`, `'salary'`, `'enumber'`, `'eaddress'`, `'deptname'`.
  - Create another table `'Company'` with attributes `'cname'`, `'ccity'`, `'empnumber'` in the database `'employee'`.
3. To study the viewing commands (select, update) and execute the following queries using these commands:
  - Find the names of all employees who live in Chennai.
  - Increase the salary of all employees by Rs.5,000.
  - Change the company city to Chennai where the company name is `'TCS'`.
4. To study the commands that involve compound conditions (and, or, in, not in, between, not between, like, not like) and execute the following queries using these commands:
  - Find the names of all employees who live in `'Chennai'` and whose salary is between Rs.20,000 to Rs.30,000.
  - Find the names of all employees whose names begin with either letter `'A'` or `'B'`.
  - Find the company names where the company city is `'Chennai'` and the number of employees is not between 5000 and 10,000.

- Find the names of all companies that do not end with letter 'A'
5. a) Create a database 'polytechnic college'. Create 2 users namely 'staff' and 'Student'.
    - Grant all privileges to the user 'staff' and grant only 'create' privilege to 'student' user and verify the same.
    - Revoke all privileges to the 2 users and verify the same.
  - b) Implement the following transactions control statements.
    - i) Commit ii) Rollback iii) Save point
  6. Create table author with the following structure author id author name address mobile book title pages published on
    - i) Insert 4 books published by 3 authors each. (12 records)
    - ii) Fetch all the rows and observe how the data duplicated.
    - iii) Apply 1<sup>st</sup> and 2<sup>nd</sup> normal forms to fix it.
  7. To study the commands for views and execute the following queries using these commands:
    - Create a view having ename and ecity
    - In the above view change the ecity to 'Chennai' where ename is 'John'.
    - Create a view having attributes from both the tables.
    - Update the above view and increase the salary of all employees of IT department by Rs.1000.
  8. Create a library table with proper fields. Create another table called library1 and insert rows from library table.
 

Hint:

```
CREATE TABLE new_table LIKE original_table;
INSERT INTO new_table SELECT * FROM original_table;
```

## PART – B

40 Hrs

9. Create a table to store the details of a customer in a Bank. Do some transactions like withdrawal, deposit. Find the Balance amount(Credit Limit). Based on customer's credit limit, write a program using **IF** or **CASE** flow control statements to find the customer levels namely SILVER, GOLD or PLATINUM.
 

If the Credit limit is

  - greater than 50K, then the customer level is PLATINUM
  - less than 50K and greater than 10K, then the customer level is GOLD
  - less than 10K, then the customer level is SILVER
10. Create two tables with the following structure.
  - a) **users - table name**
    - user id - UNSIGNED, INT, AUTO INCREMENT, PRIMARY KEY
    - username - VARCHAR (60)
    - password - VARCHAR (128)email
    - VARCHAR (255)
  - b) **users profiles**
    - user id - FOREIGN KEY refers to user id field of user table
    - first name - VARCHAR(60)
    - last name - VARCHAR(60)
    - mobile -VARCHAR(15)
    - i) SELECT all the users along with their profile details. (Hint: Use INNERJOIN)
    - ii) SELECT the users who do not have profiles (Hint: USE LEFT JOIN and exclude the rows generated with NULL values from joining table)
11. Create an employee database and create a stored procedure that accepts Employee Id as input and returns complete details of employee as output.
12. Create two tables with the following structure
 

**Authors**

  - author id - INT

name VARCHAR (60)  
titles count INT -- holds the total number numbers of titles authored.

### Titles

author id - INT  
name VARCHAR (512) -- name of the title

a. Create a trigger to update the titles count field of respective row in authors table each time a title gets inserted into titles table.

b. Create **log table** with the following structure

author id - INT  
name VARCHAR (512) -- name of the title  
status VARCHAR(25) -- addition, deletion, updation

and insert an entry in that table each time the tile is added, deleted or updated. Use a trigger to accomplish this.

13. Create a table containing phone number, user name, address of the phone user. Write a function to search the address using phone number.

14. Create a table to store the salary details of the employees in a company. Declare the cursor id to contain employee number, employee name and net salary. Use cursor to update the employee.

15. Write a program to connect PHP with MySQL and create a database using PHP MySQL.

**NOTE:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation.

### DETAILED ALLOCATION OF MARKS

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

## 6447 - ELECTRICAL AND ELECTRONICS ENGINEERING PRACTICAL

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6447 ELECTRICAL AND ELECTRONICS ENGINEERING PRACTICAL	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### EXERCISES

**80 Hrs**

- A. Checking of power supply in SMPS  
B. Construct the circuit and draw the graph for different stages of Bridge rectifier with filter using CRO
- Construct the circuit and draw the forward characteristics of PN junction Diode and find input resistance.
- Construct the circuit and draw the reverse characteristics of Zener Diode and find breakdown voltage.
- Construct the circuit and draw the VI characteristics of LED

5. Construct the circuit and draw the characteristics of LDR
6. Construct CE configuration circuit and draw the input characteristics and also find input resistance.
7. Construct CE configuration circuit and draw the output characteristics and also find output resistance.
8. A. Verify the truth tables of NAND, AND, NOR, OR, NOT, XOR using IC's  
B. Realization of basic gates using either NAND or NOR gate.
9. Construct and verify Half adder and Half subtractor
10. Construct and verify the truth table of Full adder
11. Construct and verify the truth table of Full subtractor
12. Verify the truth tables of RS,D,T and JKFF
13. Construct and test the parity generator and checker function using IC74180
14. Construct and test the 4bit Ripple counter (IC7493)
15. Construct and test decade counter (IC7490)

**Examination Pattern:**

**Note:** All the exercises have to be completed. Any one exercise will be given for examination. The students are allowed to select the question by lot. Record notebook should be submitted during the practical examination.

**DETAILED ALLOCATION OF MARKS**

ALLOCATION	Max. Marks
Writing any one Experiment (Circuit diagram, Tabular column, Truth Table / Equation / Formula)	45 Marks
Construction	40 Marks
Result	10 Marks
Viva-Voce	05 Marks
<b>Total</b>	<b>100 Marks</b>

**Note:** Some experiments are done using Bread board.

## FIFTH SEMESTER

### 6451 - OBJECT ORIENTED PROGRAMMING WITH JAVA

#### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6451 OBJECT ORIENTED PROGRAMMING WITH JAVA	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\*Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

#### DETAILED SYLLABUS

**UNIT- I**

**FUNDAMENTALS OF OOPS & JAVA**

**Chapter1.1 Basics of OOPs**

**6 Hrs**

Introduction to object oriented programming - basic concepts of object oriented programming - objects and classes - data abstraction and encapsulation, inheritance, polymorphism, dynamic binding, message communication - application of oops.

**Chapter 1.2 Introduction to Java**

**7 Hrs**

History of java - java features - java environment - jdk - api- types of java program - creating and executing a java program - java tokens: keywords, character set, identifiers, literals, and separator - java virtual machine (jvm) - comments in java program.

**Chapter 1.3 Elements**

**5 Hrs**

Constants - variables - data types - type casting - scope of variables - operators types - expressions - evaluation of expressions.

**UNIT - II**

**CONTROL STRUCTURES, ARRAYS, VECTORS AND STRINGS**

**Chapter 2.1 Decision making and Branching**

**6 Hrs**

Decision making: simple if statement - if - else statement - nesting if - else - else if ladder - switch statement, looping: while loop - do - while loop - for loop - break - labeled loop - continue statement.

**Chapter 2.2 Arrays and Vectors**

**6 Hrs**

Arrays: one dimensional array - creating an array - array processing - multidimensional array, vectors: definition - creation – methods.

**Chapter 2.3 Strings**

**6 Hrs**

String class - creation - methods, string buffer class - creation – methods - difference between string and string buffer.

**UNIT - III**

**CLASSES, INTERFACES AND PACKAGES**

**Chapter 3.1 Class and object**

**7 Hrs**

Defining a class - creating objects - accessing classmembers -, constructors - method overloading - static members - nesting of methods - this keyword - command line argument.

**Chapter 3.2 Inheritance**

**7 Hrs**

Definition - types - single inheritance - multilevel inheritance - hierarchical inheritance - overriding methods - final variables and methods - final classes - final methods - abstract methods and classes - visibility control: public , private, friendly and protected. interfaces: multiple inheritance - defining interface - extending interface - implementing interface.

**Chapter 3.3 Package**

**4 Hrs**

Java API packages - system packages - naming conventions - creating & accessing a package - adding class to a package - hiding classes

**UNIT - IV**

**EXCEPTION HANDLING, MULTITHREADING AND FILES**

**Chapter 4.1 Exception Handling**

**7 Hrs**

Types of errors - exception - advantages of exception handling - basics of exception handling - try blocks - throwing an exception - catching an exception - finally statement - built in exceptions, creating own exception sub classes.

**Chapter 4.2 Multithreading**

**5 Hrs**

Introduction - life cycle of a thread - thread methods - creating threads - extending thread class - implementing runnable interface - thread priority - thread scheduling.

**Chapter 4.3 Files**

**6 Hrs**

File - streams - advantages - the stream classes - byte stream classes - character stream classes - random access files.

**UNIT -V**

**APPLETS, GRAPHICS PROGRAMMING AND AWT CONTROLS**

**Chapter 5.1 Applets**

**5 Hrs**

Introduction - applet life cycle - creating & executing an applet - applet tags in html - parameter tag.

**Chapter 5.2 Graphics programming**

**6 Hrs**

Graphics class -lines - rectangles - circles - arcs - polygon -filling objects - color class - selecting a color - font class - selecting a font - drawing bar charts.

**Chapter 5.3 AWT Components and Event Handlers**

**6 Hrs**

Abstract window tool kit - awt controls - labels - text field - buttons - checkboxes - choice - scrollbars - event handling: events, event sources, event listeners, input events - layout

managers - menus. java database connectivity: JDBC - ODBC - types of JDBC drivers - seven steps to JDBC

**Text Books:**

1 “E. Balagurusamy, ”Programming with Java”, Tata Mc-GrawHill, NewDelhi.

**Reference Books:**

- 1.“Herbert schildt “, “Java - The complete reference”, Tata Mc graw Hill, New Delhi.
2. “Java 2,J2SE1.4 Complete”, BPB Publications.
3. www.microsoft.com

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6452 - SYSTEM ADMINISTRATION AND NETWORK SERVICES**  
Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6452 SYSTEM ADMINISTRATION AND NETWORK SERVICES	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS**

**UNIT - I**

**INTRODUCTION TO OPERATING SYSTEMS**

**Chapter 1.1 Introduction**

**5 Hrs**

System administration - importance of system administration life cycle - role of system administrator - workstation - server - services - data center

**Chapter 1.2: Windows Operating Systems**

**3 Hrs**

History - architecture -client OS flavours & features - server OS flavours & features

**Chapter 1.3: Linux/Unix Operating Systems**

**2 Hrs**

Linux / Unix history - architecture - distributions – kernel

**Chapter 1.4 : Virtualization**

**5 Hrs**

Concept behind the virtualization - types of virtualization: hardware virtualization - operating system virtualization - server virtualization - storage virtualization. - virtualization benefits - virtualization security hardware virtualization technology - windows hyper visors (hyperv) - how to use hyper-v virtualization technology - virtualization tools

**UNIT - II**

**FILE SYSTEM, ACCOUNT AND MEMORY MANAGEMENT**

**Chapter 2.1: File System**

**6 Hrs**

Windows file and directory layout - NTFS - FAT - disk partitions - defragmentation - registry - linux file and directory layout - EXT4- FreeBSD - EXT3 - VFAT - disk partitions

**Chapter 2.2: Account Management**

**5 Hrs**

User management in Windows- creating and managing local users and groups - User and group management in Linux - related commands - superuser - relevant files

**Chapter 2.3 Memory**

**4 Hrs**

Windows Memory Architecture, memory management - Linux Memory Architecture, management

**UNIT - III**

**WINDOWS ADMINISTRATION**

**Chapter 3.1: Introduction**

**3Hrs**

Windows boot process - computer management - disk management - system process - process identifier - user mode process - kernel mode process - managing start-up process

**Chapter: 3.2: Windows Services**

**3 Hrs**

Active directory - domain - tree - forests - groups - objects - task scheduler

**Chapter: 3.3: Windows Performance****3 Hrs**

Understanding physical and virtual memory - paging file - task manager - performance monitor - resource monitor

**Chapter: 3.4: Windows Security****3 Hrs**

Windows defender - firewall - firewall inbound/outbound rules - group policy - windows services.

**Chapter: 3.5: Maintenance****3 Hrs**

WSUS (Windows Server Update Service) - windows backup & recovery mechanisms - windows error reporting (wer)

**UNIT - IV****LINUX / UNIX ADMINISTRATION****Chapter 4.1: Introduction****6 Hrs**

Boot process overview – Daemons – Boot Loaders GRUB – systemd – start-up scripts – process life cycle – process monitoring

**Chapter: 4.2: Access Control****6 Hrs**

Introduction – File system access control – process ownership – management of root account – user management - ACL- types

**Chapter 4.3: Software Management****3 Hrs**

Package management tools - rpm - dpkg - apt - yum

**UNIT - V****NETWORK SERVICES****Chapter 5.1: Introduction****7 Hrs**

Network Service - common services - Domain Name System - Dynamic Host Configuration - Authentication servers -Directory services - e-Mail - File sharing - Instant messaging - Online game - Printing - File server - Voice over IP - Video on demand - Video telephony - World Wide Web - Simple Network Management - Time service - Wireless sensor network

**Chapter: 5.2: Protocols Used****4 Hrs**

TCP/IP, IPV4, Ipv6 address format - MAC address - LAN - WAN- DHCP - ICMP - SMTP - POP3 - DNS –SNMP - Protocols Used: Address Resolution Protocol(ARP), User Datagram Protocol (UDP), Hyper Text Transfer Protocol Secure (HTTPS), Telnet,

**Chapter 5.3: Networking requisites and tools****2 Hrs**

Pre-requisites to connect the computers to access the shared resources - exchange server configuration - network monitoring tools. (wireshark)

**Text Books:**

- 1."Thomas A. Limoncelli, Christina J.Hogan, Strata R.Chalup", "The practice of System and Network Administration", Addison Wesley (2ndEdition).

**Reference Books:**

- 1."Evi Nemeth, Garth Snyder, Trent R.Hein, Ben Whaley, Dan Mackin", "Unix and Linux System Administration Handbook", Addison Wesley Inc.
- 2."Windows Server Administration Fundamentals" from Microsoft
3. www.microsoft.com

\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)

**6453.1 - ELECTIVE THEORY - I: COMPONENT BASED TECHNOLOGY**  
**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6453.1 COMPONENT BASED TECHNOLOGY	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS****UNIT - I**



## **INTRODUCTION TO .NET FRAMEWORK AND C#.NET**

### **Chapter 1.1 Introduction to .NET framework**

**3 Hrs**

Features of .NET framework, .NET architecture - managed code and the CLR - intermediate language, meta data and JIT compilation-automatic memory management. - assembly, .NET objects, .NET web services

### **Chapter 1.2: Visual Studio .NET**

**3 Hrs**

Features, using the .NET framework, exploring the visual studio integrated development environment - system requirements - versions

### **Chapter 1.3: Introduction to C#.NET**

**4 Hrs**

Variables and constants - data types - declaration. operators - types - precedence - expressions - program flow - decision statements - if .. then, if..then..else, switch..case, loop statements - while, do...while, for..next, for..each..next.

### **Chapter 1.4 : Types**

**3 Hrs**

Value data types - structures, enumerations. reference data types - single dimensional- multi-dimensional arrays - jagged arrays - dynamic arrays

### **Chapter 1.5 : Classes & objects**

**2 Hrs**

Creating and using your own classes - data members and member methods - instantiate an object

## **UNIT - II**

### **APPLICATION DEVELOPMENT USING C# .NET**

#### **Chapter 2.1: Windows programming**

**4 Hrs**

Creating windows forms-working with toolbox controls- button, check box, combo box, label, list box, radio button, text box, group boxes, picture box

#### **Chapter 2.2 Advanced Controls and Events**

**3 Hrs**

Timer , progress bar, month calendar , tooltips, tab controls, panels -events-click, close, deactivate, load, mouse move, mouse down, mouse up, key press ,key down, key up.

#### **Chapter 2.3 Multiple Document Interface (MDI) Forms**

**4 Hrs**

Creating MDI Applications - Creating MDI child windows - arranging MDI child windows

#### **Chapter 2.4 Menus and Dialog Boxes**

**4 Hrs**

Creating menus - menu items - creating submenus , menu shortcuts, context menu - using dialog boxes - show dialog() method.

## **UNIT - III**

### **APPLICATION DEVELOPMENT USING ADO.NET**

#### **Chapter 3.1: Features of ADO.NET**

**5 Hrs**

Architecture of ADO.NET - ADO.NET providers - connection - command - data adapter - dataset.

#### **Chapter: 3.2: Accessing Data with ADO.NET**

**5 Hrs**

Connecting to data source, accessing data with data set and data reader - modifying table data using command objects - understanding data set and working with data column and data row - data tables - working with data grid view

#### **Chapter: 3.3: Create an ADO.NET application**

**5 Hrs**

Using Stored Procedures

## **UNIT - IV**

### **INTRODUCTION TO ASP.NET**

#### **Chapter 4.1: ASP.NET Features**

**4 Hrs**

Change the home directory in IIS - add a virtual directory in IIS set a default document for IIS - change log file properties for IIS - stop, start, or pause a web site - global.asax file - different stages of an ASP.NET page-page request, starting of page life cycle, page initialization ,page load ,validation.

#### **Chapter: 4.2: Creating Web Controls**

**4 Hrs**

Web controls - html controls, using intrinsic controls, using input validation controls, selecting controls for applications - adding web controls to a page.

#### **Chapter 4.3 : Creating Web Forms**

**4 Hrs**

Server controls - types of server controls - adding ASP.NET code to a Page.

#### **Chapter 4.4 .NET CORE WEB API**

**3 Hrs**

What's web API?, web API features, restful services, method of rest

## UNIT - V

### XML

#### Chapter 5.1: Introduction

4 Hrs

Advantages - HTML Vs XML - browsing and parsing XML - creating a XML file - data island - well formed XML document - XML components: elements - entities - comments - processing instructions - attributes

#### Chapter: 5.2: DTD

5 Hrs

Declarations in DTD: element, attribute, entity and notation - construction of an XML document - XML namespaces - declaring namespaces - default namespaces - XML schema - need and use of schema - building blocks - simple elements - defining attributes - complex elements

#### Chapter 5.3: XML with .NET

4 Hrs

XML serialization in the .NET framework - soap fundamentals- using soap with the .NET framework.

#### Text Books:

1. Douglas J. Reilly, Designing Microsoft ASP.NET Applications, Microsoft Press

#### Reference Books:

1. ISRD Group, Applicationsof.NET Technology, TMGH Education PvtLtd.,New Delhi

2. E. Balagurusamy, Programming In C#, 3E, Tata McGraw-Hill Education,

3. Rebecca M. Riordan, ADO NET 2 0 Step by Step, Microsoft Press

4. David S. Platt, Introducing Microsoft .NET, Microsoft Press

5. Introduction to Microsoft ASP.NET - Work Book, Microsoft Press

\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)

## 6453.2 - ELECTIVE THEORY - I: ARTIFICIAL INTELLIGENCE AND DATA ANALYTICS

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6453.2 ARTIFICIAL INTELLIGENCE AND DATA ANALYTICS	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\*Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### DETAILED SYLLABUS

## UNIT - I

### ARTIFICIAL INTELLIGENCE

#### Chapter 1.1 Artificial Intelligence

4 Hrs

What is AI?-types of AI -history of AI -turing test- structure of AI - goals of AI -importance of AI - techniques used in AI -perception, understanding and action- technological drivers of modern AI.

#### Chapter 1.2 Knowledge

4 Hrs

Definition - knowledge representation - objectives and requirements - practical aspects of representation-components Intelligent Agents: agents and environments-properties of environments- characteristics of agents- classification of agents.

#### Chapter 1.3 Problem Solving

7 Hrs

Problem formulation-goal formulation-state space search-search problem-basic search algorithm-search tree-search strategies - uninformed and informed search-breadth first search, depth first search, best first search- constraint satisfaction problem (csp)- backtracking search. Problem definitions: n queen problem, 8 puzzle problem, tic-tac-toe.

## UNIT - II

### INTRODUCTION TO MACHINE LEARNING

#### Chapter 2.1 Learning

5 Hrs

Strategies of Learning - Learning Model - Classes of Learning (Supervised, Unsupervised, Reinforcement) - Process of ML - Common types of ML algorithms.

#### Chapter 2.2 Neural Network

4 Hrs

Biological and artificial, mathematical model of a neuron

## **Chapter 2.3 Machine Learning Applications**

**6 Hrs**

Learning associations, regression, classification, prediction- natural language processing (nlp) - automatic speech recognition (asr) - machine vision-robotics.

### **UNIT - III**

#### **DATA ANALYTICS AND NUMPY LIBRARY**

##### **Chapter 3.1 Data Analytics**

**4 Hrs**

Data-types of data - importance of data- data analysis vs data analytics - types of data analytics - elements of analytics - data analysis process - qualitative and quantitative analyses - open - source data.

##### **Chapter: 3.2 Introduction to Python**

**5 Hrs**

Features of python-installing python- python ides- pypi python package index- pip python package manager- importing libraries and functions- python data structures (list, set, tuple, dict)- functional programming (map, filter, reduce, lamda, list comprehension).

##### **Chapter: 3.3 NumPy Library**

**6 Hrs**

Introduction- installation- ndarray: creating an array, intrinsic creation of an array, data types- basic operations- aggregate functions- indexing, slicing, iterating- conditions and boolean arrays- array manipulation: joining, splitting, shape changing, sorting- structured arrays- reading and writing array data on a file.

### **UNIT - IV**

#### **DATA ANALYSIS WITH PANDAS**

##### **Chapter 4.1 Introduction**

**5 Hrs**

Pandas data structures: series - declaration, selecting elements, assigning values, filtering values, operations, mathematical functions, evaluating values, handling missing data, creating series from dictionaries, adding two series.

##### **Chapter: 4.2 Data Frame**

**4 Hrs**

Defining, selecting elements, assigning values, membership, deleting a column, filtering. index objects: indexing, re-indexing, dropping- sorting and ranking- descriptive statistics

##### **Chapter 4.3 Data Loading**

**6 Hrs**

Reading and writing csv, xls, text data files- data cleaning and preparation: handling missing data, removing duplicates, replacing values- vectorized string methods- hierarchical indexing- merging and combining- data aggregation and grouping.

### **UNIT - V**

#### **VISUALIZATION WITH MATPLOTLIB**

##### **Chapter 5.1 Data Visualization**

**3 Hrs**

Introduction to Matplotlib - PyPlot package - Figures and Subplots showing plots and images - visualization with matplotlib - Data Extraction

##### **Chapter: 5.2 Customizing Plots**

**4 Hrs**

Colors, Markers, Line Styles, Limits, Ticks, Labels, Legends, Grids - Annotating with text- Matplotlib configuration - Retrieve Rows by Index Label with loc Accessor - Retrieve Rows by Index Position with iloc Accessor

##### **Chapter 5.3 Chart types**

**6 Hrs**

Line, Bar, stacked bar, Box plots, pie chart - Histogram and Density plots- Scatter plot- Saving Plots to a file- Close and clear plots.

#### **Text Books:**

1. Tom Taulli - Artificial Intelligence Basics. A Non-Technical Introduction-Apress (2019)

#### **Reference Books:**

1. Chowdhary K.R - Fundamentals of artificial intelligence-Springer (2020)
2. Stuart J.Russell,PeterNorvig- Artificial Intelligence A Modern Approach- (Prentice Hall- 2010, Edition 3)
3. NPTEL Web Content-Artificial Intelligence, Prof.P.Mitra,Prof.S.Sarkar, IIT Kharagpur(Link: <https://nptel.ac.in/courses/106/105/106105078/> )
4. Fabio Nelli, Python Data Analytics, APRESS, 2015

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

## 6453.3 ELECTIVE THEORY - I: MOBILE APPLICATION DEVELOPMENT

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
<b>6453.3 MOBILE APPLICATION DEVELOPMENT</b>	Hrs / Week	Hrs / Sem	Marks			Duration
	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
					25	100

\*Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### DETAILED SYLLABUS

#### UNIT - I

##### INTRODUCTION TO MOBILE COMPUTING

**Chapter 1.1 Introductions to Mobile Computing** **5 Hrs**

Evolution of mobile computing - important terminologies

**Chapter 1.2 Wireless LAN and Protocols** **5 Hrs**

Wi-Fi and Wi-max , bluetooth ,RFID, Wi-Fi-Direct, Li-Fi, LTE, and 6LoWPAN , VoLTE

**Chapter 1.3 Cellular Network Generations** **5 Hrs**

Features of 1G,2G ,3G ,4G ,5G

#### UNIT - II

##### MOBILE AND SMART TV OPERATING SYSTEM

**Chapter 2.1 Mobile Operating Systems** **4 Hrs**

Evaluation of mobile operating system-handset manufactures and their mobile OS- mobile OS and their features. linux kernel based mobile OS

**Chapter 2.2 Apple Mobile Operating Systems** **3 Hrs**

History and features of apple operating systems - iPadOS, tvOS, and watchOS

**Chapter 2.3 Smart TV operating systems** **4 Hrs**

Smart TV operating system development history - versions and their features

**Chapter 2.4 Android Operating System** **4 Hrs**

Android operating system development history - versions and its feature - the various android devices on the market , the android market application store

#### UNIT - III

##### ANDROID DEVELOPMENT ENVIRONMENT

**Chapter 3.1: Android development Environment** **4 Hrs**

System requirements, android sdk, installing java, and adt bundle - eclipse integrated development environment (ide), creating android virtual devices (avds) - android studio

**Chapter: 3.2: Android Architecture** **4 Hrs**

Android architecture - the linux kernel, android runtime - dalvik virtual machine, android runtime - core libraries, dalvik vm specific libraries, java interoperability libraries, android libraries, application framework

**Chapter: 3.3: Creating a New Android Project** **4 Hrs**

Defining the project name and SDK settings, project configuration settings, configuring the launcher icon

**Chapter 3.4: Activity** **3 Hrs**

Creating an activity, running the application in the AVD, stopping a running application, modifying the example application, reviewing the layout and resource files.

#### UNIT - IV

##### BASIC AND ADVANCED VIEWS

**Chapter 4.1: Basic Views** **4 Hrs**

Text view, button, image button, edit text, checkbox, toggle button, radio button and radio group views, progress bar view, auto complete text view

**Chapter: 4.2: Advanced Views** **4 Hrs**

Time picker view and date picker view - list views - image view - menus - analog and digital view - dialog boxes

- Chapter 4.3: Displaying Pictures and Menus with Views** **4 Hrs**  
 Image view - gallery view – image switcher - grid view - creating the helper methods - options menu - context menu
- Chapter 4.4: SMS and Dialer** **3 Hrs**  
 Sending sms - receiving sms - making phone call

**UNIT - V**

**LOCATION BASED SERVICES AND SQLITE**

- Chapter 5.1: location based service** **4 Hrs**  
 Obtaining the maps API key- displaying the map - zoom control - navigating to a specific location - adding marker - geo coding and reverse geo coding
- Chapter: 5.2: Content Provider and Storage** **4 Hrs**  
 Sharing data - view contacts - add contacts - modify contacts - delete contacts - store and retrieve data's in internal and external storage - sqlite - creating and using databases
- Chapter 5.3: Android Service** **3 Hrs**  
 Consuming web service using HTTP, downloading binary data - downloading text content - accessing web service- Security and Hacking : Active Transactions- More on Security- Hacking Android
- Chapter 5.4: Cross Platform App Development** **2 Hrs**  
 Cross platform application development tools and their features- Platforms and Additional Issues : Development Process- Architecture, Design, Technology Selection- Mobile App Development Hurdles- Testing

**Text Books:**

1.J. F. DiMarzio (Author) -Beginning Android Programming with Android Studio, 4th Ed. (2016) Wiley

**Reference Books:**

1. Wei-MengLee -Beginning Android 4 Application Development,2012 - Wiley India Edition
2. Asoke K Talukder,Hasan Ahmed, Roopa R Yavagal Mobile Computing,2005 – TMGH

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6454 - JAVA PROGRAMMING PRACTICAL**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6454 JAVA PROGRAMMING PRACTICAL	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks

**PART - A**

**40 Hrs**

1. Write a program to read the temperature in celsius and convert into Fahrenheit.
2. Write a program to read 2 integers and find the largest number using conditional operator.
3. Write a program to read an integer and find the factorial of a number.
4. Write a program to implement vector class and its methods.
5. Write a program to read a string and check whether it is palindrome or not.
6. Write a program to create a class with following data members.
  - 1) Register number.
  - 2) Name.
  - 3) Marks in 3 subjects and member functions.
    - 1) parameterized constructor - to assign values to members.
    - 2) method to find total mark.
    - 3) method to display register number, name, total mark create 3 objects from the above class and use the members.
7. Write a program that accepts radius of a circle from command line & display its area.

**PART - B**

**40 Hrs**

8. Write a program to implement multilevel inheritance.
9. Write a program to create a own exception subclass that throws exception if the given number is not in a range of numbers.
10. Write a program that creates three threads. first thread displays - "Good Morning" everyone second, the second thread displays - "Hello" every two seconds and the third thread displays - "Welcome" every three seconds.
11. Write a program to create a file using byte stream or character stream class.
12. Write a program to demonstrate mouse events.
13. Write a program to display basic shapes using graphics class and fill them using color class.
14. Write a program to create a simple calculator to perform addition, subtraction, multiplication and division using button, label and text field.

**NOTE:**

All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

**DETAILED ALLOCATION OF MARKS**

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

**6455 - SYSTEM ADMINISTRATION AND NETWORK SERVICES PRACTICAL**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6455 SYSTEM ADMINISTRATION AND NETWORK SERVICES PRACTICAL	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**PART - A**

**48 Hrs**

1. Installation of Windows 10 in the hyper visor environment and configure the network adapter. Assign the static IP address for the computer.  
Hint : Before installing the Windows 10 in the hyper visor environment, ensure that hyper v feature enabled in the system where hyper v is hosted and vtx feature is enabled in the BIOS.
2. Installation of Windows 10 in the virtual box environment and configure the network adapter and enable sharing the resources (folders, usb devices etc., ) between host computer and guest computer  
Hint : Before installing virtual box in the host computer, ensure that Hyper V feature is disabled in the system and VT x is enabled in the BIOS.
3. Installation of any Linux distribution in the hyper visor environment, configure the network adapter and assign the IP address. Enable the sharing of file folders from host machine.

4. Enable the local networking of two computers.
5. Install the server operating system and configure the AD, DNS and connect the client computer to the server computer.
6. Install the server operating system and configure the AD, DNS and connect the client computer to the server computer. Create specific user in the Server computer and login from the client computer.
7. Create firewall rule in windows to disable the specific port for incoming and outgoing traffic. (e.g., block the HTTP and HTTPS port)
8. Create FTP Server in the Windows 10 computer, and retrieve the contents from FTP server via FTP protocol.

**PART – B**

**32 Hrs**

1. Install the server operating system and configure the DNS and connect the client computer to the server computer. Configure the static IP in the client computer and verify.
2. Install the server operating system and configure the DNS and connect the client computer to the server computer. Do not Configure the static IP in the client computer and verify the client computer is assigned with automatic IP.
3. Create automatic task in windows and demonstrate the task is executed in a timely manner. [Hint : Using Windows Task Scheduler]
4. Note down, physical memory and virtual memory of the running process in Windows / Linux along with priority of the process.
5. Configure send mail / Mail Enable (free Windows email software) in the Server system and create email id. Demonstrate the email messages are reached to specific recipient.
6. Restoring the Windows Operating System to pre-defined known state after the installation of new software. [Hint: Using Windows System Restore point]

**NOTE:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

**DETAILED ALLOCATION OF MARKS**

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

**6456.1 ELECTIVE PRACTICAL - I: COMPONENT BASED TECHNOLOGY PRACTICAL**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
			Internal Assessment	External Exam*	Total	
<b>6456.1 COMPONENT BASED TECHNOLOGY PRACTICAL</b>	5 Hrs	80 Hrs	25	100	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**PART – A**

**40 Hrs**

1. Accept a character from console and check the case of the character.
2. Write a program to accept any character from keyboard and display whether it is vowel or not.
3. Write a program to implement a calculator with memory and recall operations.
4. Develop a form in to pick a date from Calendar control and display the day, month, and year details in separate text boxes.
5. Develop a application using the file and directory controls to implement a common dialog box
6. Develop a database application to store the details of students using ADO.NET
7. Create a simple ASP.NET page to output text with a form, two HTML text boxes, an HTML button, and an HTML <span> element. Create an event procedure for the button.

### **PART – B**

**40 Hrs**

1. Develop a menu based application to implement a text editor with cut, copy, paste, save and close operations with accessing and shortcut keys.
2. Develop an application to perform timer based quiz of 5 questions.
3. Develop a database application using ADO.NET to insert, modify, update and delete operations.
4. Develop a application using datagrid to add, edit and modify records.
5. Develop a web application to input data through a web form to a database and validate the data. Use the required field validator and range validator controls.
6. Develop a window application to read an XML document containing subject, mark scored, year of passing into a dataset
7. Develop a window application to read students records from Database using ADO.NET and generate XML document containing students records

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

### **DETAILED ALLOCATION OF MARKS**

<b>Allocation</b>	<b>Max. Marks</b>
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks
Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

## **6456.2 - ELECTIVE PRACTICAL - I: DATA ANALYTICS USING PYTHON PRACTICAL**

### **Teaching and Scheme of Examination**

No. of weeks per semester: 16

<b>SUBJECT</b>	<b>INSTRUCTION</b>		<b>EXAMINATION</b>			
	Hrs / Week	Hrs / Sem	Marks			Duration
<b>6456.2 DATA ANALYTICS USING PYTHON PRACTICAL</b>	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.



**PART - A****40 Hrs****Perform the exercises in PART A using NumPy****1. Basic data structures in NumPy**

- a. Create a List, set, tuple and dictionary which stores the details of a student (rollno, name, dept, branch, percentage of mark) in Python and print the values.
- b. Convert the list and tuple as NumPy array.

**2. Arrays in NumPy**

- a. Create arrays using different intrinsic methods (ones, zeros, arrange, line space, indice) and print their values.
- b. Check the results of arithmetic operations like add(), subtract(), multiply() and divide() with arrays created using arange and ones intrinsic method.
- c. Check the results of mathematical operations like exp(), sqrt(), sin(), cos(), log(), dot() on an array created using arange intrinsic method.

**3. Built-in functions in NumPy.**

- a. Load your class Mark list data from a csv (comma separated value) file into an array. Perform the following operations to inspect your array. Len(), ndim, size, dtype, shape, info()
- b. Apply the aggregate functions on this data and print the results.
- c. (Functions like min(), max(), cumsum(), mean(), median(), corrccoef(), std())

**4. Handling Multiple Arrays**

- a. Create two python NumPy arrays (boys, girls) each with the age of n students in the class.
- b. Get the common items between two python NumPy arrays.
- c. Get the positions where elements of two arrays match.
- d. Remove from one array those items that exist in another.
- e. Extract all numbers between a given range from a NumPy array.

**5. Array Slicing in NumPy**

- a. Load your class Marklist data into an array called —marks” to store students roll\_num, subject marks and result.
- b. Split all rows and all columns except the last column into an array called
- c. —featuresll.
- d. Split the marks array into 3 equal-sized sub-arrays each for 3 different subject marks.
- e. Split the last column into an array —labelll.
- f. Delete the roll\_num column from the marks array and insert a new column student name in its place.

**6. Indexing & Sorting in NumPy**

- a. Load your class Marklist data from a csv file into an array.
- b. Access the mark of a student in a particular subject using indexing techniques.
- c. Sort the student details based on Total mark.
- d. Select a subset of 2D array using fancy indexing (indexing using integer arrays)
- e. Print student details whose total marks is greater than 250 using Boolean indexing.

**7. Handling Two dimensional array in NumPy**

- a. Import iris dataset with numbers and texts keeping the text intact into python NumPy.
- b. Convert the 1D iris to 2D array (iris2d) by omitting the species text field.
- c. Find the number and position of missing values in iris2d's sepal\_length
- d. Insert np.nan values at 20 random positions in iris 2d dataset
- e. Filter the rows of iris2d that has petal\_length > 1.5 and sepal\_length < 5.0

**PART - B****40 Hrs****Perform the exercises in PART B using Pandas****8. Working with a Series**

- a) Create a series using list and dictionary.
- b) Create a series using NumPy functions in Pandas.
- c) Print the index and values of series.

d) Print the first and last few rows from the series.

### 9. Working with DataFrame Columns

- a) Create and print a DataFrame.
- b) Find the descriptive statistics for each column.
- c) Group the data by the values in a specified column, values in the index.
- d) Set Index and columns in a DataFrame.
- e) Rename columns and drop columns
- f) Select or filter rows based on values in columns.
- g) Select single and multiple columns with specific names

### 10. Working with DataFrame Rows

- a) Slicing DataFrame using loc and iloc.
- b) Filter multiple rows using isin.
- c) Select first n rows and last n rows
- d) Select rows randomly n rows and fractions of rows (use df.sample method)
- e) Count the number of rows with each unique value of variables
- f) Select nlargest and nsmallest values.
- g) Order/sort the rows

### 11. Handling missing data and duplicates

- a) Identify rows with missing data ( isnull(), notnull()) and replace NA/Null data with a given value.
- b) Drop rows and columns with any missing data (dropna(), dropna(1))
- c) Find duplicate values and drop duplicates.
- d) Fill the missing values using forward filling and backward filling.
- e) Replace the missing value with new value and write the dataframe to a CSV file in the local directory.

### 12. Merge and combine data

- a) Perform the append, concat and combine\_first operations on DataFrames.
- b) Apply different types of merge on data.
- c) Use a query method to filter DataFrame with multiple conditions.

### Perform the following exercises using Pandas matplotlib

#### 13. Consider the Salary dataset, which contains 30 observations consisting of years of working experience and the annual wage (in dollars).

- a) Create a linear plot to identify the relationship between years of working experience and the annual wages with suitable title , legend and labels.
- b) Create a scatter plot to identify the relationship between years of working experience and the annual wages with title , legend and labels.
- c) Also distinguish between observations that have more than 5 years of working experience and observations that have less than 5 years of working experience by using different colors in one single plot.

#### 14. Consider the Iris dataset, where observations belong to either one of three iris flower classes.

- a) Visualize the average value for each feature of the Setosa iris class using a bar chart.
- b) Format the obtained bar graph by Changing the color of each bar, Change the Edge color, Line width and Line style.

#### 15. Consider the Iris dataset, where observations belong to either one of three iris flower classes.

- a) Visualize the Histogram for each feature (Sepal Length, Sepal Width,petal Length & petal Width) separately with suitable bin size and color.
- b) Plot the histograms for all features using subplots to visualize all histograms in one single plot. Save the plot as JPEG file.
- c) Plot the boxplots for all features next to each other in one single plot.

### DETAILED ALLOCATION OF MARKS

Allocation	Max. Marks
Procedure Writing - One Question from Part - A	20 Marks
Procedure Writing - One Question from Part - B	25 Marks

Executing Exercise (Part - A)	20 Marks
Executing Exercise (Part - B)	20 Marks
Result (Part - A)	05 Marks
Result (Part - B)	05 Marks
Viva - voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

### 6456.3 - ELECTIVE PRACTICAL - I: MOBILE APPLICATION DEVELOPMENT PRACTICAL

#### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6456.3 MOBILE APPLICATION DEVELOPMENT PRACTICAL	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

#### PART - A

40 Hrs

1. Develop an App to demonstrate activity(Application Life Cycle) (example metric conversion - metre to Km, grams to Kg, litres to Kilo litre ).
2. Write an App to demonstrate different types of layouts.
3. Write an App to implement simple calculator using text view, edit view, option button and button.
4. Write an App to demonstrate list view (student particulars).
5. Write a program to display Text in Text View using different Font Style.
6. Write a program to demonstrate Auto Complete Text View.
7. Write a program to demonstrate Image Button View.
8. Write a program to change the Background and Foreground Color of Text View.

#### PART – B

40 Hrs

1. Write a program to demonstrate date picker and time picker
2. Develop an simple application with context menu and option menu
3. Develop an application to send SMS
4. Write a program to view, edit contact
5. Write a program to send e-mail
6. Write a program to display map of given location / position using map view
7. Write a program to demonstrate the application of intentclass
8. Write a program to demonstrate SQLite (Create Database , Table , Insert Update, Delete and view records)

#### DETAILED ALLOCATION OF MARKS

ALLOCATION	Max. Marks
User interface design diagram and XML in Part-A	05 Marks
Writing program in Part-A	15 Marks
Execution of program Part-A	20 Marks
Printed Output (Part -A)	05 Marks
User interface design diagram and XML in Part-B	05 Marks
Writing program in Part-B	20 Marks
Execution of program in Part-B	20 Marks
Printed Output (Part -B)	05 Marks

Viva - voce	05 Marks
<b>TOTAL</b>	<b>100</b>

## 6457 - ENTREPRENERUSHIP AND STARTUPS

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
<b>6457 ENTREPRENERUSHIP AND STARTSUPS</b>	4 Hrs	64 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### DETAILED SYLLABUS

#### UNIT - I

##### **Entrepreneurship - Introduction and Process**

**10 Hrs**

- Concept, Functions and Importance
- Myths about Entrepreneurship
- Pros and Cons of Entrepreneurship
- Process of Entrepreneurship
- Benefits of Entrepreneur
- Competencies and characteristics
- Ethical Entrepreneurship
- Entrepreneurial Values and Attitudes
- Motivation
- Creativity
- Innovation
- Entrepreneurs - as problem solvers
- Mindset of an employee and an entrepreneur
- Business Failure - causes and remedies Role of Networking in entrepreneurship,

#### UNIT - II

##### **Business Idea and Banking**

**10 Hrs**

- Types of Business: Manufacturing, Trading and Services.
- Stakeholders: sellers, vendors and consumers and Competitors
- E- commerce Business Models
- Types of Resources - Human, Capital and Entrepreneurial tools and resources
- Selection and utilization of human resources and professionals, etc.
- Goals of Business; Goal Setting
- Patent, copyright and Intellectual property rights
- Negotiations - Importance and methods
- Customer Relations and Vendor Management
- Size and capital based classification of business enterprises
- Various sources of Information,
- Role of financial institutions
- Role of Government policy
- Entrepreneurial support systems
- Incentive schemes for state government Incentive schemes for Central governments,

#### UNIT - III

##### **Start ups, E-cell and Success Stories**

**10 Hrs**

- Concept of Incubation centre's
- Visit and report of DIC, financial institutions and other relevance institutions
- Success stories of Indian and global business legends

- Field Visit to MSME's
- Study visit to Incubation centers and start ups
- Learn to earn
- Startup and its stages
- Role of Technology - E-commerce and Social Media
- Role of E-Cell E-Cell to Entrepreneurship.

#### **UNIT - IV**

##### **Pricing and Cost Analysis**

**10 Hrs**

- Unit of Sale, Unit Price and Unit Cost - for single product or service
- Types of Costs - Start up, Variable and Fixed
- Income Statement
- Cash flow Projections
- Break Even Analysis - for single product or service
- Taxes
- Financial Business Case Study
- Understand the meaning and concept of the term Cash Inflow and Cash Outflow
- Price
- Calculate Per Unit Cost of a single product
- Operational Costs
- Understand the importance and preparation of Income Statement
- Prepare a Cash Flow Projection,
- Projections
- Pricing and Factors affecting pricing.
- Launch Strategies after pricing and proof of concept

#### **UNIT - V**

##### **Business Plan Preparation**

**10 Hrs**

- Generation of Ideas.
- Business Ideas vs. Business Opportunities
- Opportunity Assessment - Factors, Micro and Macro Market Environment
- Selecting the Right Opportunity
- Product selection
- New product development and analysis
- Feasibility Study Report - Technical analysis, financial analysis and commercial analysis
- Market Research - Concept, Importance and Process
- Market Sensing and Testing
- Marketing and Sales strategy
- Digital marketing
- Branding - Business name, logo, tag line
- Promotion strategy
- Business Plan Preparation
- Social Entrepreneurship as Problem
- Solving - Concept and Importance
- Risk Taking-Concept
- Types of business risks Execution of Business Plan

#### **FIELD VISITS AND PREPARATION OF CASE STUDY REPORT**

**14 Hrs**

#### **Reference Books:**

1. Dr. G.K. Varshney, Fundamentals of Entrepreneurship, Sahitya Bhawan Publications, Agra - 282002
2. Dr. G.K. Varshney, Business Regulatory Framework , Sahitya Bhawan Publications, Agra - 282002
3. Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd, Entrepreneurship , McGraw Hill (India) Private Limited, Noida - 201301
4. M.Scarborough, R.Cornwell, Essentials of Entrepreneurship and small business management, Pearson Education India, Noida - 201301

5. Charantimath Poornima M. Entrepreneurship Development and Small Business Enterprises, Pearson Education, Noida - 201301
6. Trott, Innovation Management and New Product Development, Pearson Education, Noida - 201301
7. M N Arora, A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd., New Delhi-110044
8. Prasanna Chandra, Financial Management, Tata McGraw Hill education private limited, New Delhi
9. V. Trivedi, Renu Jatana, Indian Banking System, RBSA Publishers, Rajasthan
10. Simon Daniel, HOW TO START A BUSINESS IN INDIA, BUUKS, Chennai - 600018
11. Ramani Sarada, The Business Plan Write-Up Simplified - A practitioners guide to writing the Business Plan, Notion Press Media Pvt. Ltd., Chennai 600095.

### Evaluation Pattern Internal Mark Allocation

Allocation		Max. Marks
1.	Assignment (Theory portion)*	10
2.	Seminar Presentation	10
3.	Attendance	05
<b>Total</b>		<b>25</b>

**Note:** \* Two assignments should be submitted. The same must be evaluated and converted to 10 marks. Each assignment should have five three marks questions and two five marks questions.

### DETAILED ALLOCATION OF MARKS

S.No	Description	Marks
Part A	Written Examination - Theory Question and answer (10 questions x 3 marks:30 marks & (3 questions x 5 marks: 15 marks)	45
Part B	Practical Examination -Submission on Business Plan/Feasibility Report or Report	40
Part C	Viva- voce	15
<b>Total</b>		<b>100</b>

# SIXTH SEMESTER

## 6461 - WEB DESIGN AND PROGRAMMING

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6461 WEB DESIGN AND PROGRAMMING	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### DETAILED SYLLABUS

#### UNIT - I

#### INTERNET, HTML AND ADVANCED HTML

##### Chapter 1.1: Internet

**7 Hrs**

History of the Internet - Basics of Networking Concepts - WAN, LAN, TCP/IP, UDP, FTP, Telnet, SMTP, Ports - World Wide Web - HTTP, SMTP, POP3, MIME, Understanding roles of Web Browsers - Concepts of Web Servers.

##### Chapter 1.2: HTML

**6 Hrs**

Introduction - Basic Tags of HTML - HTML Tag - TITLE Tag - BODY Tag - Formatting of Text: Headers - Formatting Tags: BOLD, ITALICS, UNDERLINE, PARAGRAPH, TT, STRIKETHROUGH, EM, BR and HR tags - PRE Tag - FONT Tag - Special Characters - Working with Images - META Tag.

##### Chapter 1.3: Advanced HTML

**5 Hrs**

Difference between HTML & HTML5 - New elements in HTML5 - Links - Anchor tag - Lists - Unordered Lists - Ordered Lists - Definition Lists; Tables - TABLE, TR and TD Tags - Colspan and Rowspan.

## UNIT - II

### FRAMES, FORMS AND CSS

#### Chapter 2.1: Frames

2 Hrs

Frameset - FRAME Tag - Frame inside other frames - NOFRAMES Tag.

#### Chapter 2.2: Forms

4 Hrs

FORM and INPUT Tag - Textbox - Radio Button - Checkbox - SELECT Tag and Pull Down Lists: Hidden - Submit and Reset; Some Special Tags: COLGROUP - THREAD, TBODY, TFOOT - \_blank, \_self, \_parent, \_top - IFRAME - LABEL - Attribute for <SELECT> - TEXTAREA.

#### Chapter 2.3: CSS

6 Hrs

Introduction - Features - Style Sheet basics - Working with CSS files - Syntax - Types of Style Sheets - Inline Styles - Embedded Styles - External or Linked Styles - What is CSS3? Animation - Borders - Backgrounds - Fonts - Multiple columns - Text effects.

#### Chapter 2.4: Formatting Text and Fonts

6 Hrs

Font Families Font Size Kerning, Leading and Indenting - Formatting Colors and Backgrounds: The Color Attribute - The Background Attribute - Background Colors and Images. Exploring CSS Class and ID Attributes: Defining the CSS Class Attribute - Defining the CSS ID Attribute - Dynamic effects with CSS - Lists- Tables - Forms - Simple Examples using above properties.

## UNIT - III

### JAVASCRIPT

#### Chapter 3.1: JavaScript Basics

6 Hrs

Need of scripting languages - Variables and Data Types: Declaring Variables - Life span of variables - Data Types - Operators: Assignment, comparison, computational and logical operators - Control Structures: Conditional Statements - Loop Statements: for, while, for in, break and continue statements.

#### Chapter 3.2: Object-Based Programming and Message boxes

6 Hrs

Functions - Executing Deferred Scripts - objects: Document object Model, Predefined objects, Array object, History object, Location object - Dialog Boxes - Alert Boxes - Confirm Boxes - Prompt Boxes.

#### Chapter 3.3: JavaScript with HTML

6 Hrs

Events - Event Handlers: onLoad and onUnload - onFocus and onBlur - onError - Forms: Forms Array - Form element properties - Introduction to jQuery - Features of jQuery - jQuery example.

## UNIT - IV

### PHP

#### Chapter 4.1: Introduction

4 Hrs

A Brief Introduction to Apache, MySQL, PHP and Open Source - Server-Side Web Scripting.

#### Chapter 4.2: PHP

6 Hrs

PHP Structure and Syntax - Integrating HTML with PHP - Syntax and Variables - Constants and Variables - Passing Variables between Pages - if Statements - if and else - switch case - for loop - for each loop.

#### Chapter 4.3: Includes

8 Hrs

Includes and Functions for Efficient Code - Strings - Arrays and Array Functions - Sessions and Cookies - Sample Programs - Alternates to Incrementing/Decrementing Values - Advanced Features of PHP - Objects-Terminology - creating an object -accessing properties and methods - declaring a class.

## UNIT - V

### PHP PROGRAMMING AND MYSQL

#### Chapter 5.1: PHP with MYSQL

5 Hrs

MySQL Syntax and Commands - Connecting to the MySQL Server -Data types - Functions - Querying the Database - SELECT, Logical Operators - MySQL Programs.

#### Chapter 5.2: Form Elements

4 Hrs

Processing the Form - FORM Element - Tables to Display Data - Edit, Update and Delete data.

**Chapter 5.3: Hands on Experiments**  
 Creating a Simple Shopping - Cart Script - Mini Project.

**8 Hrs**

**Text Books:**

1. Douglas E. Comer —The Internet Bookll, Prentice Hall.

**Reference Books:**

1. Terry Felke-Morris —Web Development and Design Foundations with HTML5, Pearson.
2. Thomas A. Powell, Fritz Schneider—HTML & CSS: The Complete Reference, Tata McGraw-Hill.
3. Thomas Powell, Fritz Schneider—Java Script: The Complete Reference, Tata McGraw-Hill.

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6462 - COMPUTER NETWORKS AND CYBER SECURITY**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6462 COMPUTER NETWORKS AND CYBER SECURITY	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS**

**UNIT - I**

**DATA COMMUNICATIONS**

**Chapter 1.1: Data Communication**

**3 Hrs**

Components of a data communication - data flow: simplex - half duplex- full duplex; networks - network criteria - types of connections: point to point - multipoint; topologies: Star, Bus, Ring, Mesh, Hybrid - advantages and disadvantages of each topology.

**Chapter 1.2: Types of Networks**

**6 Hrs**

Need for computer Networks - LAN - MAN - WAN - CAN - HAN - Internet - Intranet - Extranet , Client-Server, Peer to Peer, Mobile Networks, Data Centre Networks, Service Provider Networks

**Chapter 1.3: Transmission Media**

**4 Hrs**

Characteristics of Transmission Media - Classification of transmission media - Guided - Twisted pair - Coaxial - Fiber optics - Unguided - Radio waves - Infrared - Low Orbit satellite (LOS) - VSAT - Cabling and Standards

**Chapter 1.4: Network devices**

**3 Hrs**

Features and Concepts of Switches - Routers (Wired and Wireless) - Gateways.

**Chapter 1.5: Synchronization in Networks**

**2 Hrs**

Concepts of Frequency and Time synchronization in Computer networks

**UNIT - II**

**OSI MODEL AND LAN PROTOCOLS**

**Chapter 2.1: Network Models**

**3 Hrs**

Protocol definition - Standards - OSI Model - Layered architecture- Functions of all layers.

**Chapter 2.2: 802.X Protocols**

**6 Hrs**

Concepts and PDU format of CSMA/CD (802.3) - Token bus (802.4) - Token ring (802.5) - Ethernet - Types of Ethernet (Fast Ethernet, gigabit Ethernet, High speed Ethernet 10GE to 800GE) -Comparison between 802.3, 802.4 and 802.5 - Overview of Carrier Ethernet and use cases

**Chapter 2.3: WAN Networks**

**3 Hrs**

Different layers in Service Provider Networks - Protocols Involved - High level design of Data Centre Networks

**Chapter 2.4: Understanding Wireless Network protocols**

**2 Hrs**

802.11a, 802.11b, 802.11g, 802.11n, 802.11ac.

**Chapter 2.5: Switching**

**2 Hrs**

Definition - Circuit switching - Packet switching - Message switching - Optical Switching OTN-Multicasting

**Chapter 2.6: BNG**

**2 Hrs**



BNG - Concepts - Services - Broadband NextGen

**UNIT - III**

**TCP/IP SUIT AND PROTOCOLS**

**Chapter 3.1: Overview of TCP / IP**

**3 Hrs**

OSI & TCP/IP - Transport Layer Protocol- Connection Oriented and Connectionless Services - Sockets - TCP & UDP.

**Chapter 3.2: Network Layers Protocol**

**3 Hrs**

IP - Interior Gateway Protocols (IGMP, ICMP, ARP, RARP, IGP, BGP Concept only).

**Chapter 3.3: IP Addressing**

**3 Hrs**

Dotted Decimal Notation -Subnetting &Supernetting - VLSM Technique-IPv6 (concepts only)

**Chapter 3.4: Application Layer Protocols**

**3 Hrs**

FTP- Telnet - SMTP- HTTP - DNS - POP

**Chapter 3.5: QoS and Traffic Engineering**

**4 Hrs**

Overview of QoS and Traffic Engineering techniques and protocols

**Chapter 3.6: OAM**

**2 Hrs**

Concepts of OAM in networks Protocols - Fault detection and isolation

**UNIT - IV**

**NETWORK SECURITY**

**Chapter 4.1: Introduction to Network security**

**3 Hrs**

Definition - Need for security - Principles of Security - Attacks - Types of Attacks - Criminal attacks - Legal Attacks - Passive and Active attacks - Software Supply Chain attacks - Security Services - Security Mechanisms.

**Chapter 4.2: Cryptography**

**4 Hrs**

Definition - Symmetric Encryption principles - Symmetric Block Encryption Algorithms - DES, AES - Stream ciphers - RC4 - Digest function - Public key Cryptography Principles- RSA- Diffe - Hellman algorithm- Digital Signature (Definition only)

**Chapter 4.3: Network Security Application**

**4 Hrs**

Authentication applications - Kerberos (concepts only) - Overview- Motivation -Encryption Techniques;

**Chapter 4.4: Internet Security**

**7 Hrs**

Email security - PGP - S/MIME - IP security - Overview -IP Security Architecture - Web security - SSL, TLS ,SET ( Concepts only) - Link Layer MACSEC security overview- Network Address Translation NAT - Distributed Denial of Service attacks- DDoS and its mitigation - Lawful intercept of traffic flow overview - Rogue (or Unauthorized/Ad-Hoc) Access Points ,Evil Twin Attacks, Freeloading

**UNIT - V**

**NETWORK SECURITY MECHANISMS AND CYBER SECURITY**

**Chapter 5.1: Introduction to Network Security**

**2 Hrs**

Definition and Basic concepts-Basic concepts of RAID levels (0, 1, 2, 3,4, 5).

**Chapter 5.2: Security Mechanism**

**2 Hrs**

Introduction - Types of Firewalls - Packet filters - Application gate ways- Limitations of firewalls.

**Chapter 5.3: Wireless Security Issues**

**3 Hrs**

Definition and Types -Transmission Security, Authentication, WLAN Detection, Eaves Dropping, Active Attacks, WEP Definition and Features.

**Chapter 5.4: Network Security Appliances**

**2 Hrs**

Overview of Network security appliances: IPSec, DDoS, NAT, IPS gateways.

**Chapter 5.5: Cyber Security**

**4 Hrs**

Cyber Space -Cyber Security domains - Countermeasures - Critical infrastructure security – Network security-Application security-Cloud security-Information security -Disaster ecover - end user education - Concept of cyber security

**Chapter 5.6: Common Cyber Threats**

**4 Hrs**

Cybercrime - Cyber stalking -Forgery and Counterfeiting-Spamming - Cross Site Scripting - Cyber Squatting - Web Jacking - Salami Attack - Data Diddling - Cyber-attack - Cyber-terrorism - common methods - Malware - Ransomware - Phishing / social engineering -Insider threats - DDoS - Advanced persistent threats - man-in-middle attack- Cyber Security Techniques

**Text Books:**

1. Behrouz A.Forouzen, —Data Communication and Networking, TataMcGraw- Hill, Fifth Edition.
2. William Stallings, —Network Security Essentials, Pearson Publications, Fifth Edition.
3. William Stallings, —Cryptography and Network Security, Pearson Publications, Sixth Edition.

**Reference Books:**

1. Achyut.S.Godbole, —Computer Communication and Networks, TataMcGraw- Hill,New Delhi.
2. Andrew S. Tanenbanum, —Computer NetworksII, Pearson Publications, Fifth Edition.
3. Behrouz A.Forouzen, —Cryptography and Network Security, TataMcGraw- Hill,New Delhi, 3<sup>rd</sup> Ed.
4. " Dr. Jeetendra Pande",Introduction to Cyber Security, Uttarakhand Open University,2017

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)****6463.1 - ELECTIVE THEORY- II: MULTIMEDIA SYSTEMS****Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6463.1 MULTIMEDIA SYSTEMS	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS****UNIT - I****INTRODUCTION TO MULTIMEDIA****Chapter 1.1 Introduction****3 Hrs**

Definition of multimedia, multimedia basics, multimedia elements, multimedia applications, delivering multimedia.

**Chapter 1.2 Multimedia Systems Architecture****3 Hrs**

Multimedia workstation architecture, high resolution graphic displays, the IMA architectural framework, network architecture for multimedia systems.

**Chapter 1.3 Evolving Technologies for Multimedia Systems****3 Hrs**

Hypermedia Documents, Hypertext, Hyper Speech, HDTV and UDTV, 3D Technologies and Holography.

**Chapter 1.4 Defining Objects for Multimedia System****3 Hrs**

Text, Images, Audio and Voice, Full-Motion and Live Video, Multimedia Data Interface Standards, Video Processing Standards.

**Chapter 1.5 Multimedia Software****3 Hrs**

Overview of Multimedia Software Tools, Open Source Replacements, Multimedia OS, VRML, OpenGL, Windows and Open Source API.

**UNIT - II****DEFINING OBJECTS FOR MULTIMEDIA SYSTEMS****Chapter 2.1 Text****2 Hrs**

About Fonts and Faces, Using Text in Multimedia, Hypermedia and Hypertext, Using Hypertext, Hypermedia Structures, Hypertext Tools.

**Chapter 2.2 Images****4 Hrs**

Making Still Images, Bitmaps, 1 bit images, 8-bit gray level images, 8- bitcolor images, Dithering, 24 bit color images, Vector Drawing, 3-D Drawing and Rendering, Color, Understanding Natural Light and Color, Computerized Color, Color Palettes, Color Look-up table. Image Processing, Image acquisition, Image enhancement. Color image processing.

**Chapter 2.3 Sound****3 Hrs**

The Power of Sound, Digital Audio, Making Digital Audio Files, MIDI Audio, MIDI vs. Digital Audio, Multimedia System Sounds, Adding Sound to Your Multimedia Project , Audio Recording, Keeping Track of Your Sounds, Audio CDs, Sound for your Mobile, Sound for the Internet.

**Chapter 2.4 Animation****3 Hrs**

The power of motion, principles of animation, animation by computer, animation techniques. animation using OpenGL.

**Chapter 2.5 Video****3 Hrs**

Using video, how video works and is displayed, analog video, digital video, displays, digital video containers, codec, video format converters, obtaining video clips, shooting and editing video.

### **UNIT - III**

#### **MULTIMEDIA DATA AND STANDARDS, DATABASE**

##### **Chapter 3.1 Data Compression**

**3 Hrs**

Need for data compression, general data compression scheme, compression standards, non-lossy compression for images, lossy compression for photographs and video, hardware vs software compression.

##### **Chapter 3.2 Compression Schemes and standards**

**3 Hrs**

(Only Concepts of) Binary Image Compression, Color, Gray Scale and Still-Video Image Compression, JPEG, Video Image Compression, Multimedia Standards for Video, Requirements for Full-motion Video Compression, MPEG, Audio compression Fractal compression, advantages / disadvantages.

##### **Chapter 3.3 Data and File Format Standards**

**3 Hrs**

Popular File Formats, RTF, RIFF, GIF, PNG, TIFF, MIDI, JPEG, JFIF, AVI, WAV, BMP, WMF, MIX, MPEG standards. TWAIN.

##### **Chapter 3.4 Database System**

**3 Hrs**

Data Types in Multimedia Databases, Storage and Retrieval, Database Management System, Database Organization and Transaction Management for Multimedia System.

##### **Chapter 3.5 Content Based Retrieval in Digital Libraries(C-BIRD)**

**3 Hrs**

C-BIRD GUI - Color Histogram - Color Density - Color Layout - Texture layout- - Search by Illumination Invariance - Search by Object Model.

### **UNIT - IV**

#### **MULTIMEDIA DEVICES AND MAKING MULTIMEDIA**

##### **Chapter 4.1 Multimedia Input/output Technologies**

**5 Hrs**

Limitations of Traditional input devices, Multimedia input / output devices, PEN input, Working of Electronic Pen, Digitizer, (only the concepts of) Video and Image display systems, Printer, Scanner. Digital voice and video: Voice Recognition system, Digital Camera, Video frame grabber, Video and still image processing, Full - motion video controller, Video Capture Board - CRT - display terminology - flat panel display system.

##### **Chapter 4.2 Making Multimedia**

**4 Hrs**

The Stages of a Multimedia Project: Creativity, Organization, Communication, Hardware, Software: Text Editing and Word Processing Tools, OCR Software, Painting and Drawing Tools, 3-D Modeling and Animation Tools, Image-Editing Tools, Sound-Editing Tools, Animation, Video, and Digital Movie Tools, Authoring Systems, Making Instant Multimedia, Types of Authoring Tools.

##### **Chapter 4.3 Multimedia Skills**

**3 Hrs**

The team, project manager, multimedia designer, interface designer, writer, video specialist, audio specialist, multimedia programmer, producer of multimedia for the web.

##### **Chapter 4.4 Designing and Producing**

**3 Hrs**

Designing, designing the structure, designing the user interface, producing-tracking, copyrights.

### **UNIT - V**

#### **MULTIMEDIA FOR INTERNET AND STREAMING**

##### **Chapter 5.1 The Internet and Multimedia**

**3 Hrs**

The Bandwidth Bottleneck, Internet Services, MIME Types, Multimedia on the Web, Web Page Makers and Site Builders, Plug-ins and Delivery Vehicles.

##### **Chapter 5.2 Designing for the World Wide Web**

**3 Hrs**

Developing for the Web, Small-Device Workspace, text and images for the Web, lick able Buttons, Client-Side Image Maps, Sound for the Web, Animation for the Web, and Video for the Web, HTML5 Video - Plug-ins and Players.

##### **Chapter 5.3 Multimedia Communication**

**3 Hrs**

Study of Multimedia networking, Quality of data transmission, Media on demand, Multimedia Over Wireless and Mobile Networks - Media Entertainment, web-based applications, e-learning and education.

##### **Chapter 5.4 Streaming**

**4 Hrs**

Introduction - Applications of Streaming- The Streaming Architecture, Stream Serving: Webcasting - On-Demand Servicing - Voice and Video Conferencing - Internet telephony - Virtual Reality.

**Text Books:**

1. Fundamental of Multimedia, Pearson Education, Ze- Nian Li and M.S. Drew Second Ed, 2014.

**Reference Books:**

1. Multimedia: Making It Work ,Tay Vaughan,Tata-McGrawHill.
2. Multimedia systems Design ,Prabhat, k.Andleigh, Kiran Thakra,PHI
3. Multimedia Computing Communication and Applications ,Ralf Steinmetz, and Klara Nahrstedt,
4. Principles of Multimedia,Ranjan Parekh,TMGH, New Delhi.
5. Multimedia Systems ,John F. Koegel Buford,Pearson Education.
6. The Technology of Video and Audio Streaming David Austerberry,Focal Press

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)**

**6463.2 - ELECTIVE THEORY - II: SOCIAL NETWORKING AND ETHICAL HACKING**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
6463.2 SOCIAL NETWORKING AND ETHICAL HACKING	5 Hrs	80 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**DETAILED SYLLABUS**

**UNIT - I**

**NETWORKS- CONCEPTS**

**Chapter 1.1: Network Concepts Basics**

**4 Hrs**

Networks concepts - nodes, edges, adjacency matrix, one and two- mode networks, node degree

**Chapter 1.2: Network centrality Concepts**

**4 Hrs**

Betweenness, closeness, eigenvector centrality (+ Page Rank), network centralization

**Chapter 1.3: Community Concepts**

**3 Hrs**

Clustering, community structure, modularity, overlapping communities.

**Chapter 1.4: Network models**

**2 Hrs**

Small world network models, optimization, strategic network formation and search Concepts

**Chapter 1.5: Geographic Networks**

**2 Hrs**

Geographic networks, Decentralized search

**UNIT - II**

**SNA, ONLINE SOCIAL NETWORKS AND NETWORK MODELS**

**Chapter 2.1: Erdos-Renyi and Barabasi-Albert- Concepts**

**4 Hrs**

Erdos-renyi and barabasi-albert- concepts - connected components, giant component, average shortest path, diameter, breadth-first search, preferential attachment.

**Chapter 2.2: Watts-Strogatz Model**

**2 Hrs**

Watts-Strogatz Model - Network generation

**Chapter 2.3: Social Network services**

**3 Hrs**

Facebook, LinkedIn, Twitter, Couch Surfing using SNA to understand their users and improve their functionality.

**Chapter 2.4: Network models**

**3 Hrs**

Simple contagion, threshold models, opinion formation, unusual applications of SNA.

**Chapter 2.5: Strings**

**3 Hrs**

String - Declaration and initialization of strings, Reading and writing Strings, String handling functions - String manipulation programs.

**UNIT - III**

**INTRODUCTION TO ETHICAL HACKING, BUFFER OVERFLOWS,SQL INJECTION**

**Chapter 3.1: Introduction to Ethical Hacking** **2 Hrs**

Introduction - understanding the importance of security, concept of ethical hacking

**Chapter 3.2: Essential Terminologies** **4 Hrs**

Threat, attack, vulnerabilities, target of evaluation, exploit. phases involved in hacking, foot printing, scanning, system hacking, session hijacking

**Chapter 3.3: Buffer Overflows** **3 Hrs**

Significance of buffer overflow vulnerability, reasons for buffer overflow attacks, methods of ensuring that buffer overflows are trapped.

**Chapter 3.4: Sniffers** **4 Hrs**

Active and passive sniffing, ARP poisoning and countermeasures, Man in the middle attacks, Spoofing and Sniffing attacks. Sniffing countermeasures.

**Chapter 3.5: SQL Injection** **2 Hrs**

SQL Injection - Attacking SQL Servers, Preventive Measure - How to Hack WiFi (Wireless) Network: DoS (Denial of Service) Attack -Ping of Death, DDOS, How to Hack a Web server, How to Hack a Website

**UNIT - IV**

**WEB APPLICATION SECURITY AND TECHNOLOGIES**

**Chapter 4.1: Web Application Security** **3 Hrs**

Web application security - core defence mechanisms. handling user access

**Chapter 4.2: Web Application Authentication** **3 Hrs**

Authentication, session management, access control.

**Chapter 4.3: Web Application Technologies** **3 Hrs**

Web Application Technologies - HTTP Protocol, Requests, Responses and Methods.

**Chapter 4.4: Encoding Schemes** **4 Hrs**

Encoding schemes, Server side functionality technologies (Java, ASP,and PHP).

**Chapter 4.5: Web Application Threats and Hacking** **2 Hrs**

Web Application Threats, Web Application Hacking.

**UNIT - V**

**ATTACKING AUTHENTICATION**

**Chapter 5.1: Attacking Authentication** **4 Hrs**

Attacking Authentication - Attacking Session Management, Design Flaws in Authentication Mechanisms

**Chapter 5.2: Password functionality** **4 Hrs**

Attacking Forgotten Password Functionality, Password change functions, Countermeasures to authentication attacks

**Chapter 5.3: Attacking other users** **5 Hrs**

Attacking other users - Reflected XSS Vulnerabilities, Stored XSS Vulnerabilities, DOM-Based XSS Vulnerabilities, HTTP Header Injection. Countermeasures to XSS.

**Text Books:**

1. Network Security and Ethical Hacking, Rajat Khare, Luniver Press, 2006.

**Reference Books:**

1. Network intrusion alert: an ethical hacking guide to intrusion detection, Ankit Fadia, Manu Zacharia, Thomson Course Technology PTR, 2007.
2. Patrick Doreian, Frans Stokman, Evolution of Social Networks, Routledge, 2013

\* **Pattern of End Semester Exam Question Paper - General Pattern (Theory).**

**6463.3 - ELECTIVE THEORY - II: DATA SCIENCE AND BIG DATA**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION	
	Hrs / Week	Hrs / Sem	Marks	Duration
6463.3				

<b>DATA SCIENCE AND BIG DATA</b>	5 Hrs	80 Hrs	<b>Internal Assessment</b>	<b>External Exam*</b>	<b>Total</b>	
			25	100	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

## **DETAILED SYLLABUS**

### **UNIT - I**

#### **INTRODUCTION TO DATA SCIENCE**

##### **Chapter 1.1 Data Science**

**6 Hrs**

Subfields of data science - data types - data science road map - programming languages for data science - problems with data - formatting issues - python features - python technical libraries - python arrays and data frames.

##### **Chapter 1.2 Data sources**

**4 Hrs**

Data quality - consistency and accuracy (integrity), noise: outliers, missing and duplicate values - data preprocessing using cleaning, enrichment, editing, reduction, wrangling - data formats: TXT, CSV, XML, JSON, TLV- loading and saving files.

##### **Chapter 1.3 Working with Excel:**

**5 Hrs**

Loading data - statistical functions - text functions- lookup functions - sorting - filtering - data analysis: correlation, covariance, descriptive statistics, regression

### **UNIT - II**

#### **FUNDAMENTALS OF DATA MODELLING**

##### **Chapter 2.1 Linear Algebra**

**5 Hrs**

Data representation - data as a matrix - samples and attributes- classification of attributes- concept of rank-identify the relationship among attributes

##### **Chapter 2.2 Predictive models**

**5 Hrs**

Regression models - linear regression - simple and multiple regression-correlation-mean squared error-testing goodness of fit- model equation

##### **Chapter 2.3 Classification models**

**5 Hrs**

Two class- multi class classification- separability- performance measures- terminology- confusion matrix-types (concepts only): neural network- decision trees- nearest neighbors.

### **UNIT - III**

#### **FUNDAMENTALS OF BIG DATA**

##### **Chapter 3.1 Big Data Fundamentals**

**6 Hrs**

Data- web data- classification of data - big data - characteristics - volume, velocity, variety, veracity, value- need for big data- big data types and classifications - sources of big data- big data handling techniques-challenges.

##### **Chapter 3.2 Impact of ICT developments on Big data Adoption**

**4 Hrs**

Data analytics and data science, digitization, affordable technology and commodity hardware, social media, hyper connected communities and devices, cloud computing and IoT.

##### **Chapter 3.3 Big Data Analytics Life Cycle**

**5 Hrs**

Business case evaluation, data identification, data acquisition & filtering, data extraction, data validation & cleansing, data aggregation & representation, data analysis, data visualization, utilization of analysis results.

### **UNIT - IV**

#### **BIG DATA STORAGE**

##### **Chapter 4.1 Storage Concepts**

**5 Hrs**

Clusters, File Systems, Distributed File System, NoSQL, Sharding, Replication, Master Slave, Peer to Peer, CAP Theorem

##### **Chapter 4.2 Big Data Storage Technologies**

**5 Hrs**

On-Disk Storage Devices-Distributed File system-RDBMS- NoSQL Databases- Characteristics of NoSQL- Types of NoSQL Storage devices. In-Memory storage devices -Data Grids-Databases

**Chapter 4.3 Hadoop****5 Hrs**

Introduction - Hadoop and its Ecosystem: Hadoop core components- Features of Hadoop - Hadoop Ecosystem components - Hadoop streaming - Hadoop pipes - Hadoop distributed File system - HDFS data storage - Hadoop Ecosystem tools.

**UNIT -V****BIG DATA PROCESSING****Chapter 5.1 Big Data Processing****5Hrs**

Parallel data processing - Distributed data processing - Hadoop Framework - Processing workloads - cluster for processing - Batch processing with MapReduce - Map and Reduce Tasks - MapReduce algorithms - Processing in Realtime mode - Real time processing and MapReduce

**Chapter 5.2 Big Data Analysis Techniques****5 Hrs**

Quantitative analysis, qualitative analysis, data mining, statistical analysis: correlation, regression, machine learning: classification, clustering, outlier detection, filtering. semantic analysis: natural language processing, text analytics, sentiment analysis, visual analysis

**Chapter 5.3 Big data Analytics Applications and case studies****3 Hrs**

Big data in marketing and sales- big data and healthcare- big data in medicine- big data in advertising.

**Text Books:**

1. The Data Science Handbook, Field Cady, Wiley, 2017.

**Reference Books:**

1. Python Data Science Handbook, ,Essential tools for working with datall, Jake VanderPlas O'REILLY, 2017
2. Introducing Data Sciencell, Davy Cielen, Arno D. B. Meysman, Mohamed Ali, manning publications, 2016
3. Big Data Fundamentals Concepts, Drivers & Techniques Thomas Erl, Wajid Khattak,Prentice Hall (2016).
4. Big Data Analytics-Introduction to Hadoop, Spark and Machine Learning, Raj kamal, Preeti Saxena, McGraw Hill Education(India) Pvt Ltd., 2019.
5. "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Michael Minelli, Michelle Chambers, and Ambiga Dhiraj ,Wiley, 2013.
6. "Hadoop: The Definitive Guide", Tom White, Third Edition, O'Reilley, 2012.
7. NPTEL MOOC courses on Data Science and Big Data

**\* Pattern of End Semester Exam Question Paper - General Pattern (Theory)****6464 - WEB DESIGN AND PROGRAMMING PRACTICAL****Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
6464 WEB DESIGN AND PROGRAMMING PRACTICAL	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**LAB EXERCISES****PART - A****64 Hrs**

1. Design a HTML page describing your profile in one paragraph. Design in such a way that it has a heading, a horizontal rule, three links and your photo. Also, write three HTML documents for the links. Include facilities for forward, backward and HOME.
2. Design a HTML page about computer languages. List the language. Each Language's name is a link. Prepare separate HTML documents for each language and call them in the appropriate link.
3. Design a single page website for your polytechnic containing a description of the courses offered. It should also contain some general information about the college such as its history, the campus, and its unique features and so on. The site should be colored and each section should have a different color.
4. Develop a web page using CSS to create a time table for the class using different border style.
5. Write a Java script code that converts the entered text to uppercase.

6. Write a Java script code to validate the username and password. The username and password are stored in variables.
7. Write a Java Script code using frames and Events ( When a cursor moves over an object it should display the specification of the object in another frame ).
8. Create a site containing banner advertisement at the top of the page. The ads are changed every 10 or 15 seconds.
9. Write jQuery Program for Count the number of milliseconds between the two click events on a paragraph.
10. Write jQuery Program for Disable/enable the form submit button & Blink the text.

**PART – B**

**32 Hrs**

11. Write a PHP program to implement at least 10 string functions with description.
12. Write a PHP program to implement Date and Time Functions.
13. Create a PHP script which display the capital and country name from the given array. Sort the list by the name of the country.
14. Write a PHP script to display table with implementing Form Processing Controls of Insert and Delete data from data base.
15. Create a simple shopping - cart script using PHP and MySQL.

**NOTE:**

All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

**DETAILED ALLOCATION OF MARKS**

ALLOCATION	Max. Marks
Writing answer for any one program from PART - A	20 Marks
Writing answer for any one program from PART - B	25 Marks
Executing program - PART - A	20 Marks
Executing program - PART - B	20 Marks
Result with printout - PART - A	05 Marks
Result with printout - PART - B	05 Marks
Viva - Voce	05 Marks
<b>TOTAL</b>	<b>100</b>

**6465.1 - ELECTIVE PRACTICAL - II: MULTIMEDIA SYSTEMS PRACTICAL**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
<b>6465.1 MULTIMEDIA SYSTEMS PRACTICAL</b>	6 Hrs	96 Hrs	<b>Internal Assessment</b>	<b>External Exam*</b>	<b>Total</b>	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**LAB EXERCISES**

**96 Hrs**

1. Use a audio processing software and perform the audio editing tasks - Import audio, select and edit the sound, create fade-in and fade-out effects, label audio segments, use noise remove filter, mix multiple sound sources, change stereo to mono tracks, export audio to different format and save.
2. Use a video processing software to perform - Trim video clips, rotate video, merge video, split video, add titles, add special effects and edit video dimensions, bit rate, frame rate, sample rate, channel.
3. Create a movie from video clips to demonstrate - Audio-Video mixing, add music, video



- effects, video transition and titles.
4. Use suitable software and perform a) compress / decompress audio / video files. b) Convert audio/video to different format.
  5. Use a scanner to create two or more partial scanned images of large poster/photo. Create a panoramic view of multiple photos by stitching together them using any panorama software.
  6. Develop a web page which shows animation with sound effect using any professional HTML editor.
  7. Convert the given image into pencil sketch using suitable photo editing software.
  8. Design a certificate for sports day with different text effects using suitable software.
  9. Import any two pictures, Morph, Merge and Overlap those two pictures.
  10. Draw the raindrop that falls on the ground. Show the splash effect and sound effect using suitable software.
  11. Create a moving cloud animation using any animation software.
  12. Create a 2D animation using motion guide layer and masking.
  13. Create a 2D animation of an aero plane take off using suitable software.
  14. Design a metallic text using 3D animation tool
  15. Import an image with green screen background. Change the background of the imported image with required image using chroma key technique.

**Note:** All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

### DETAILED ALLOCATION OF MARKS

ALLOCATION	Max. Marks
Procedure / Program	45 Marks
Execution	40 Marks
Result with printout	10 Marks
Viva - Voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

## 6465.2 - ELECTIVE PRACTICAL - II: SOCIAL NETWORKING AND ETHICAL HACKING PRACTICAL

### Teaching and Scheme of Examination

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
<b>6465.2 SOCIAL NETWORKING AND ETHICAL HACKING PRACTICAL</b>	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

### LAB EXERCISES

#### PART – A

**48 Hrs**

#### Name of the Topics: Networking concepts - programs and tools

1. Write a Program to create networking nodes using python.
2. Write a program to create networking nodes degree using python.
3. Write a program to create edges using python.
4. Write a program to average birth first search using python.
5. Write a program to perform the port scanning using Nmap software
6. Write a program to monitoring TCP/IP connection using currports tools.

7. Write a program to create simple key logger using python.

**PART – B**

**48 Hrs**

**Name of the Topics: Ethical hacking and Encounter Techniques**

8. Write a program to investigate a particular website details by using who.is software
9. Write a program to encrypt and decrypt password using crypt tool software
10. Write a program to perform the commands for the website analysis in command prompt ping, ifconfig, netstat
11. Write a program to capture network traffic and analysis using wireshark software
12. Write a program to perform SQL injection attack using the XAMPP software
13. Write a program to exploit to attack the host and add the exploit to victims PC using metasploit software
14. Write a program to tamper data add-on for website using firefox

**Note:**

All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise in each PART. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

**DETAILED ALLOCATION OF MARKS**

ALLOCATION	Max. Marks
Writing answer for any one program from PART - A	20 Marks
Writing answer for any one program from PART - B	25 Marks
Executing program -PART - A	20 Marks
Executing program -PART - B	20 Marks
Result with printout - PART - A	05 Marks
Result with printout - PART - B	05 Marks
Viva - Voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

**6465.3 - ELECTIVE PRACTICAL - II: DATA SCIENCE AND BIG DATA PRACTICAL**

**Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			
	Hrs / Week	Hrs / Sem	Marks			Duration
			Internal Assessment	External Exam*	Total	
6465.3 DATA SCIENCE AND BIG DATA PRACTICAL	6 Hrs	96 Hrs	25	100	100	3 Hrs

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

**LAB EXERCISES**

**96 Hrs**

1. Load the data about the exam fee paid by the students of all branches of your college. Perform the following operations on it using Excel.
  - a. Arrange the data branch wise within the branch and arrange register numbers Replace all names with CAPITAL.
  - b. Count the number of students in each branch and semester.
  - c. Calculate the total fee paid by students of each branch.
  - d. Find the minimum and the maximum fee paid by the student.
  - e. Find the sum, average, max, min of fee paid in each branch
2. Load the data collected from all students during online answer paper submission with the following details for each exam. Regno, name, course\_code, subject\_code, semester, number\_of\_pages(nop), mode\_of\_dispatch, email\_id, mobile\_number. Perform the following operations using Excel.

- a. Check the file for any missing data in the columns.
  - b. Count the number of students appeared for the exam.
  - c. Count the number of papers (subjects) submitted by each student (Using register number)
  - d. Create a new column by concatenating register number and the subject code. Using this column, perform the vlookup function to find the number of pages (nop) written by the students in that subject, and the mode of dispatch.
  - e. Count the number of students appeared (submitted) for each subject.
  - f. Count the number of different (unique) subject codes that have been submitted.
3. Read the dataset from the Auto-MPG repository and perform the descriptive statistics on the data using Excel-Data Analysis. Verify the same using the statistical functions of Excel
4. Read the dataset from the Auto-MPG repository and
- a. Identify the relationship between the variables using correlation.
  - b. Identify the independent and the dependent variables.
  - c. Perform the linear regression on the related variables and find the regression equation.
  - d. Estimate the performance of the regression model.
5. Load any external csv data file and store it in a Pandas DataFrame.
- a. Check the shape and column types of the DataFrame (rows and columns). [Note: Use `df.info ()` and `df.shape()`]
  - b. Subset the data column by names, by index, by range.
  - c. Subset data based on index label, row index, multiple rows.
  - d. Subset based on rows and columns
6. DESCRIPTIVE STATISTICS using Python-Pandas
- a. Write a Python script to find basic descriptive statistics on AUTO-MPG dataset.
  - b. Find the values of the descriptive statistics.
  - c. Determine the measures of a central location, such as mean, markers such as quartiles or percentiles, and measures of variability or spread, such as the standard deviation.
7. READING AND WRITING DIFFERENT TYPES OF DATASETS
- a. Reading different types of data sets (.txt, .csv) from Web and disk and writing in file in specific disk location.
  - b. Reading Excel data sheet using Pandas
  - c. Export the values from the DataFrame to several other formats
8. DATA VISUALIZATION
- a. Load the Auto-MPG dataset from csv file into pandas.
  - b. Analyze the Behavior of the Number of Cylinders and Horsepower Using a Boxplot
  - c. Find the relationship between horsepower and weight using the scatter plot using the data from Auto-MPG:
  - d. Find the outliers using plot.
  - e. Plot the histogram, bar chart and pie chart on sample data.
9. COVARIANCE and CORRELATION
- a. Find the correlation and covariance between two variables.
  - b. Plot the correlation plot on the dataset and visualize giving an overview of relationships among data.
  - c. Fit a simple linear regression model using libraries such as Numpy or Scikit-learn. (`import LinearRegression from sklearn.linear_model`)
  - d. Import the packages and classes you need.
  - e. Provide data for independent and dependent variables.
  - f. Create a regression model and fit it with existing data.
  - g. Check the results of model fitting to know whether the model is satisfactory
10. OUTLIER Detection

When analyzing data collected as part of a science experiment it may be desirable to remove the most extreme values before performing other calculations. Write a function that takes a list of values and a non-negative integer, *n*, as its parameters.

The function should create a new copy of the list with the *n* largest elements and the *n* smallest

elements removed. Then it should return the new copy of the list as the function's only result. The order of the elements in the returned list does not have to match the order of the elements in the original list.

#### 11. Text Processing

- Open a text file and read all the lines of the file.
- Tokenise (separate the words) the text.
- Count the total number of lines, total number of words and unique words
- Sort the words alphabetically.
- Find the most frequent and least frequent words.
- List the words having certain suffixes.

Note: You can open a Tamil text file using 'UTF-16' encoding

#### 12. Text Processing-II

- Load a text file containing a list of words into a DataFrame. Apply the following functions and verify the results.
- Replace(),repeat(),count(pattern), startswith(pattern),endswith(pattern), find(pattern), findall(pattern).

#### NOTE:

**Mini Project:** Develop any data science application using Python / Excel for processing your college data. All the exercises should be completed and all the exercises should be given for examination. The students are permitted to select the question by lot or as per allocation. Record notebook should be submitted during the practical examination. Two exercises will be given for examination by selecting one exercise. The printout of exercises of the student work should be submitted with answer paper and the same have to be evaluated as per the allocation

#### **DETAILED ALLOCATION OF MARKS**

ALLOCATION	Max. Marks
Writing answer for any one program from the list	45 Marks
Executing the program	35 Marks
Result with printout of the Program	10 Marks
Demonstration of Mini Project	05 Marks
Viva - Voce	05 Marks
<b>TOTAL</b>	<b>100 Marks</b>

### **6466 - PROJECT WORK AND INTERNSHIP**

#### **Teaching and Scheme of Examination**

No. of weeks per semester: 16

SUBJECT	INSTRUCTION		EXAMINATION			Duration
	Hrs / Week	Hrs / Sem	Marks			
<b>6466 PROJECT WORK AND INTERNSHIP</b>	6 Hrs	96 Hrs	Internal Assessment	External Exam*	Total	3 Hrs
			25	100	100	

\* Examination will be conducted for 100 marks and the marks obtained will be converted into 75 marks.

#### **GUIDELINES FOR PROJECT FORMULATION**

The project work constitutes a major component in most of the professional programmers and it is to be carried out with due care and should be executed with seriousness by the candidates. Batch Size : Maximum 6 students per batch.

#### **TYPE OF PROJECT**

As majority of the students are expected to work out a real life project in some industry / research and development laboratories / educational institutions / software companies, it is suggested that the project is to be chosen which should have some direct relevance in day-to-day activities of the candidates in his/her institution. Students are encouraged to work in the areas listed at the end. However, it is not mandatory for a student to work on a real life project. The student can formulate a project problem with the help of Guide.

#### **PROJECT PROPOSAL (SYNOPSIS)**

The students of all the Diploma Courses have to do a Project Work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and

Training, Tamil Nadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. The Project work must be reviewed twice in the same semester. **The project work is approved during the V semester by the properly constituted committee with guidelines.**

The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. The project work should compulsorily include the software development. The project proposal should contain complete details in the following form:

1. Title of the Project.
2. Introduction and Objectives of the Project.
3. Project Category (DBMS / OOPS /Networking / Multimedia / Artificial Intelligence / xpert Systems etc.).
4. Tools / Platform, Hardware and Software Requirement specifications.
5. Analysis (DFDs at least up to second level , ER Diagrams/ Class Diagrams / Database Design etc. as per the project requirements).
6. A complete structure which includes: Number of modules and their description to provide an estimation of the student's effort onVthe project. Data Structures as per the project requirements for all the modules.
  - Process logic of each module.
  - Testing process to be used.
  - Reports generation (Mention tentative content of report).
7. Are you doing this project for any Industry/Client? Mention Yes/No. If Yes, Mention the Name and Address of the Industry or Client.
8. Future scope and further enhancement of the project. Also mention limitation of the project.

**The Project work must be reviewed twice in the same semester. The project work is approved during the V semester by the properly constituted committee with guidelines.**

**a) INTERNAL ASSESSMENT:**

The internal assessment should be calculated based on the review of the progress of the work done by the student periodically as follows:

Details of assessment	Period of assessment	Max.Marks
First Review	6 <sup>th</sup> Week	10
Second Review	12 <sup>th</sup> week	10
Attendance	Entire semester	5
<b>Total</b>		<b>25</b>

**b) Allocation of Marks for Project Work and Internship in Examination:**

Details of Mark allocation	Max. Marks
Demonstration /Presentation	25
Project Report	25
Viva Voce	30
Internship training report	20
<b>Total</b>	<b>100*</b>

\*Examination will be conducted for 100 marks and will be converted to 75 marks.

**c) Internship Training Report:**

The internship training for a period of two weeks shall be undergone by every candidate at the end of IV / V semester during vacation. The certificate shall be produced along with the internship report for evaluation. The evaluation of internship training shall be done along with final year "Project Work & Internship" for 20 marks. The internship shall be undertaken in any industry / Government or Private certified agencies which are in social sector / Govt. Skill Centres / Institutions / Schemes.

**A neatly prepared PROJECT REPORT as per the format has to be submitted by individual student during the Project Work & Internship Autonomous examination.**