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**A. SCHEME OF STUDIES**  
**12th CLASS EXAMINATION**  
**(SENIOR SECONDARY CERTIFICATE EXAMINATION-II)**  
**(VOCATIONAL STREAM)**  
**ADMISSION YEAR 2010**

**Subjects for Studies**

**(a) Compulsory Subjects : Every candidate shall offer the following subjects :**

Sr. No.	Subject	Marks for		Duration of Papers		Distribution of Period per week		Total
		Theory	Practical	Theory	Practical	Theory	Practical	
1.	General English	75	—	3 hrs	—	5	—	5
2.	General Punjabi Or Punjab History & Culture	75	—	3 hrs	—	5	—	5
3.	Environmental Education	35	15	2 hrs	1½ hrs	1	1	2
4.	Computer Science	50	50	3 hrs	3 hrs	1	1	2
5.	General Foundation Course	50	—	3 hrs	—	4	—	4

For General Foundation Course (G.F.C) :

MARKS	GRADING
75% & above	'A'
60% & above but less than 75%	'B'
50% & above but less than 60%	'C'
45% & above but less than 50%	'D'
33% & above but less than 45%	'E'
15% & above but less than 33%	'F'
Less than 15%	'G'

**Note :** To be declared 'Pass' a student has to clear General Foundation Course minimum with Grade 'E'.

**(b) Elective Subjects :**

Every candidate shall offer any one trade relating to anyone of the following groups. (Each trade has three compulsory subjects of 80 marks each and 60 marks are for O.J.T.)

- (i) Agriculture Group
- (ii) Business and Commerce Group
- (iii) Home Science Group
- (iv) Engineering & Technology Group
- (v) Humanities and Others Group

**Broad distribution of marks and periods per week.**

	Marks			Periods			
	Th.	Prac.	Total	O.J.T.	Th.	P.	Total
Elective Subject - I*	30	50	80	} 60	2	8	10
Elective Subject - II*	30	50	80		2	8	10
Elective Subject - III*	30	50	80		2	8	10

- Note :**
1. Six period are for Library Studies/Extra Curricular Activities/ Optional/ Tutorials/ Assignments.
  2. Three weeks are for On-the-job training (O.J.T) every year based on the instructions sent by the Board from time to time.
  3. \*In any subject if there is only one paper either of theory or of practical, the total marks for that subject will be 80 and the periods allotted will be ten.
  4. Punjab School Education Board Regulations for Senior Secondary Examination are also applicable to vocational stream.
  5. The Board reserves the right to amend syllabus courses and/or scheme of studies as and when it considers necessary.

**B. GENERAL FOUNDATION COURSE****Structure of question paper****Time : 3 hrs.****THEORY****M. Marks : 50**

*In all eight questions will be set from the prescribed syllabus. Student will attempt any five questions from these. Each question will carry 10 marks. A question may have two or more parts. The questions will be evenly distributed from the syllabus.*

**Syllabus****Part-A****1. Establishing the Unit**

Procedures in setting up of an enterprise- Legal requirements; Registration of the firm, size, location, layout, sanitation, insurance etc.

**2. Availing Incentives, Support and Procedural Requirement.**

Understanding the role & function of institutional network set up for promoting & supporting small entrepreneurs; Scope and benefits of assistance & incentive schemes of different institutions; Understanding the procedures & formats of application forms of institutions supporting entrepreneurs.

**3. Resource Mobilization**

Finance, raw-material, personnel etc. with specific product requirement. Network analysis with reference to specific product.

**4. Market Assessment**

Need and importance of market assessment; Components and techniques of market assessment; Nature of the product; demand analysis and assessment of consumer needs; supply analysis and market conditions; marketing practices with reference to storage, distribution, packing, credit policy, delivery, after sales service, selecting individual marketing practices; understanding the market, the market segmentation and product analysis; selecting a product and market survey for the selected product.

**Part-B****5. Enterprise Management****a. Decision Making**

Defining the problem, gathering information, analyzing information, identifying alternatives, selecting alternatives; A case exercise on decision making process.

**b. Material Management**

Purchasing and planning materials, Issue and accounting of stores & materials. Flow and control of materials, quality control and control of operations. Discussion on planning & scheduling with a small case example.

**c. Financial Management**

Accounting & book-keeping; Principles of double-entry system; Books of original record; Compilation and final accounts; Understanding financial statements; Cost concepts; Direct, Indirect & Marginal costs; pricing; budgeting and control; Preparing a small unit's master budget; Problems in obtaining working Capital Finance.

**d. Marketing Management**

The Marketing Concept; The four P's i.e. Product, price, promotion and physical distribution. Packaging; undertaking the consumer's needs; Channels of distribution: Sole selling agents, whole-sellers, retailers, stockiest, distributors, Government purchase procedures vis-à-vis small scale suppliers, Sales Promotion & Advertising; Salesmanship, characteristics of a good salesman and dealing with customers.

**e. Industrial Relation & Personnel Management**

Methods and Process of Requirement; wages & Incentives; Appraisal & Trainings; Employer-Employee Relations.

**f. Growth & Development, Modernization & Diversification**

The concept and importance of growth; Ways of achieving growth; Diversification and modernization. Case discussion on small business growth from small business to an enterprise.

**g. Industrial Visit and Presentation of Project Report**

IDENTIFICATION OF THE PRODUCT FOR SELF-ENTERPRISE/ SERVICE UNIT AND PREPARATION OF PROJECT REPORT (INDIVIDUAL WORK).

**(B) COMPULSORY SUBJECTS****1. GENERAL ENGLISH****Time : 3 hours****One Paper  
Syllabus****Max. Marks : 75****1. ENGLISH READER BOOK-VI (A textbook for detailed study) 25**

- (i) Comprehension of a given passage
- (ii) One essay type question
- (iii) Translation from Vernacular into English (isolated sentences only)

**2. SUPPLEMENTARY ENGLISH READER-VI (A textbook for non-detailed study) 20**

- (i) Short-answer questions on content of different lessons (from prose only)
- (ii) One essay-type question on theme, incident character etc.

**POETRY**

- (a) Explanation with reference to the context
- (b) Central idea of a poem

**3. USAGE AND COMPOSITION****30**

- (i) Question on change, sequence and use of tenses; reported speech, change of voice etc. based on language material contained in the prescribed textbooks
- (ii) Precis writing
- (iii) Letter-writing/Paragraph writing

**Note :** In case of students who are not familiar with any of the Modern Indian Languages, a question in lieu of translation will be as follows :

Paraphrase of a piece of verse

**Structure of Question Paper and Guidelines****Time : 3 hours****One Paper****Max. Marks : 75**

**Note :** All the questions of Part-A, Part-B and Part-C shall be based on the exercises of the textbooks prescribed by the Board

**PART-A****ENGLISH READER BOOK VI** (*Text for detailed study*)

(25 Marks)

1. (a) A passage from the above text-book to test comprehension through the following techniques :
  - (i) Name of the author and lesson from which the passage has been taken (2)
  - (ii) Short answer type questions  
(2 questions to be answers in one sentence each) (2)
  - (iii) Matching exercise  
(2 words to be attached out of 3 words) (2)
  - (iv) Fill in the blanks (two sentences) (2)
  - (v) Meaning of difficult words/phrases in simple English (2 out of 3) (2)
- (b) One essay type question to be answered in about 100 words on theme and understanding of details with internal choice. (10)
2. Translation from Vernacular into English  
5 isolated sentences from 5 different lessons of English Reader Book VI (5)

**Note :** A special question in lieu of translation for foreign students only Paraphrase of a piece of verse.

**PART-B****SUPPLEMENTARY ENGLISH READER-VI****(Text for non-detailed study)****(20 Marks)**

3. (a) Short-answer questions from different exercises given at the end of each lesson of the Supplementary English Reader VI (prose only) (Any 3 out of 5 questions to be attempted in about 25-30 words each). (3 × 2 = 6)
- (b) One essay type question on character sketch/episode/incident/theme of the lesson etc. to be attempted in about 100 words (with internal choice) (7)
- 4. Poetry :**
- (a) Explanation with reference to the context (one out of given two) 1 mark for reference to the context and 3 marks for the explanation (4)
- (b) Central idea of the given poem (with internal choice) (3)

**PART-C****USAGE & COMPOSITION****USAGE :****(30 Marks)****5. Do as indicated :**

Questions on the topics mentioned in this section will be based on the language material contained in the English Reader Book-VI and the Supplementary English Reader-VI

- (a) Fill in the blanks with prepositions and determiners (2)
- (b) Use of words as different parts of speech  
(2 words to be used both as Verbs and Nouns) (2)
- (c) Transformation of simple and compound sentences into complex sentences and vice-versa (2)
- (d) Change/Use of Tenses (2)
- (e) Change of Voice (2)
- (f) Change of Narration (2)

**COMPOSITION ;****(18 Marks)****6. PRECIS-WRITING**

(A simple passage of 150 words)

**7. LETTER-WRITING****(8)**

(Formal, business, personal letters, letters to the press, complaints, applications for job etc. with internal choice)

OR

**PARAGRAPH-WRITING**

(based on incident, episode, scene, situation etc.)

(One paragraph of 150 words to be attempted out of the given three) (10)

**Books Prescribed and Published by the Punjab School Education Board**

1. English Reader Book-VI
2. Supplementary English Reader-VI

## 2. ਲਾਜਮੀ ਪੰਜਾਬੀ ਪਾਠ-ਕ੍ਰਮ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁੱਲ ਅੰਕ : 75

(ੳ) ਮਨੋਰਥ

ਆਮ :

1. ਵਿਦਿਆਰਥੀ ਦੀ ਭਾਸ਼ਾ ਸਮਰੱਥਾ ਵਿੱਚ ਵਾਧਾ ਕਰਨਾ।
2. ਉਸ ਵਿੱਚ ਸੱਭਿਆਚਾਰਿਕ ਚੇਤਨਤਾ ਤੇ ਸਾਹਿਤਿਕ ਸੁਆਦ ਪੈਦਾ ਕਰਨਾ।

ਵਿਸ਼ੇਸ਼ :

1. ਵਿਦਿਆਰਥੀ ਨੂੰ ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਦੇ ਮੁੱਖ ਪਹਿਲਿਆਂ ਦੀ ਜਾਣਕਾਰੀ ਦੇਣਾ।
2. ਉਸ ਦੀ ਗ੍ਰਹਿਣ, ਪ੍ਰਗਟਾਅ ਤੇ ਸੰਚਾਰ ਸਮਰੱਥਾ ਵਿੱਚ ਵਾਧਾ ਕਰਨਾ।
3. ਪੰਜਾਬੀ ਦਾ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਵਿੱਚ ਵਾਧਾ ਕਰਨਾ।

(ਅ) ਪਾਠ-ਕ੍ਰਮ

1. ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਦੀ ਜਾਣ-ਪਛਾਣ।
2. ਕਾਰ-ਵਿਹਾਰ ਦੇ ਪੱਤਰ।
3. ਸੰਖੇਪ-ਰਚਨਾ।
4. ਅਖਾਉਤਾਂ।
5. ਕਵਿਤਾਵਾਂ ਤੇ ਕਹਾਣੀਆਂ।

(ੲ) ਪਾਠ-ਕ੍ਰਮ ਦਾ ਵੇਰਵਾ

1. ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਦੀ ਜਾਣ-ਪਛਾਣ (25)  
(ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ, ਪੰਜਾਬ ਦਾ ਰਹਿਣ-ਸਹਿਣ, ਪੰਜਾਬ ਦੇ ਲੋਕ-ਕਿੱਤੇ, ਪੰਜਾਬ ਦੀਆਂ ਲੋਕ-ਕਲਾਵਾਂ, ਪੰਜਾਬ ਦੇ ਰਸਮ-ਰਿਵਾਜ, ਪੰਜਾਬ ਦੇ ਮੇਲੇ ਤੇ ਤਿਉਹਾਰ, ਪੰਜਾਬ ਦੇ ਲੋਕ-ਵਿਸ਼ਵਾਸ, ਪੰਜਾਬ ਦੀਆਂ ਲੋਕ-ਖੇਡਾਂ, ਪੰਜਾਬ ਦੇ ਲੋਕ-ਗੀਤ, ਪੰਜਾਬ ਦੇ ਲੋਕ-ਨਾਚ, ਪੰਜਾਬ ਦੀਆਂ ਨਕਲਾਂ ਬਾਰੇ ਨਿਬੰਧ।)
2. ਕਾਰ-ਵਿਹਾਰ ਦੇ ਪੱਤਰ (ਨਿਤ-ਪ੍ਰਤੀ ਜੀਵਨ ਦੀਆਂ ਲੋੜਾਂ ਨਾਲ ਸੰਬੰਧਿਤ)। (10)
3. ਸੰਖੇਪ-ਰਚਨਾ (ਦਿੱਤੀ ਗਈ ਰਚਨਾ ਦਾ ਸੰਖੇਪ ਲਿਖਣਾ ਤੇ ਉਸ ਦਾ ਸਿਰਲੇਖ ਦੇਣਾ)। (10)
4. ਅਖਾਉਤਾਂ (ਅਖਾਉਤਾਂ ਦੀ ਵਿਆਖਿਆ ਦੇਣੀ ਜਾਂ ਵਰਤੋਂ ਦਰਸਾਉਣੀ)। (10)

5. ਕਵਿਤਾਵਾਂ ਅਤੇ ਕਹਾਣੀਆਂ (10)

(ਵਿਦਿਆਰਥੀ ਦੀ ਰੁਚੀ ਨੂੰ ਧਿਆਨ ਵਿੱਚ ਰੱਖਦੇ ਹੋਏ ਪੰਜ ਕਹਾਣੀਕਾਰਾਂ ਦੀਆਂ ਪੰਜ ਕਹਾਣੀਆਂ ਅਤੇ ਪੰਜ ਕਵੀਆਂ ਦੀਆਂ ਪੰਦਰਾਂ ਕਵਿਤਾਵਾਂ।)

### ਪਾਠ-ਪੁਸਤਕ

ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ - 12 ਪੰਜਾਬ ਸਕੂਲ ਸਿੱਖਿਆ ਬੋਰਡ ਵੱਲੋਂ ਪ੍ਰਕਾਸ਼ਿਤ

### ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

ਅਧਿਆਪਕਾਂ, ਵਿਦਿਆਰਥੀਆਂ, ਪੇਪਰ ਸੈਂਟਰਾਂ ਅਤੇ ਪ੍ਰੀਖਿਅਕਾਂ ਲਈ ਵਿਸ਼ੇਸ਼ ਹਿਦਾਇਤਾਂ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁੱਲ ਅੰਕ : 75

- ਪ੍ਰਸ਼ਨ ਨੰ.1 ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ-12, ਪਾਠ-ਪੁਸਤਕ ਦੇ ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਭਾਗ ਦੇ ਪਾਠ-ਅਭਿਆਸਾਂ ਵਿੱਚੋਂ ਛੋਟੇ ਉੱਤਰਾਂ ਵਾਲੇ ਅੱਠ ਪ੍ਰਸ਼ਨ ਪੁੱਛ ਕੇ ਉਹਨਾਂ ਵਿੱਚੋਂ ਪੰਜ ਦਾ ਉੱਤਰ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।  
5+5+5+5+5=(25)
- ਪ੍ਰਸ਼ਨ ਨੰ.2 ਕਾਰ-ਵਿਹਾਰ ਦੇ ਪੱਤਰ ਲਈ ਦੋ ਵਿਸ਼ੇ ਦੇ ਕੇ ਕਿਸੇ ਇੱਕ ਦੇ ਬਾਰੇ ਪੱਤਰ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।  
2+6+2=(10)
- ਪ੍ਰਸ਼ਨ ਨੰ.3 ਸੰਖੇਪ-ਰਚਨਾ ਕਰਨ ਲਈ ਇੱਕ ਪੈਰਾ ਦਿੱਤਾ ਜਾਵੇਗਾ। ਪ੍ਰੀਖਿਆਰਥੀ ਇਸ ਪੈਰੇ ਦੀ ਸੰਖੇਪ-ਰਚਨਾ ਕਰੇਗਾ। ਜੋ ਮੂਲ ਰਚਨਾ ਦਾ ਲਗ-ਪਗ ਇੱਕ ਤਿਹਾਈ ਹੋਵੇਗੀ। ਸੰਖੇਪ ਰਚਨਾ ਦਾ ਸਿਰਲੇਖ ਦੇਣ ਲਈ ਵੀ ਕਿਹਾ ਜਾਵੇਗਾ।  
8+2=(10)
- ਪ੍ਰਸ਼ਨ ਨੰ.4 ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ-12, ਪਾਠ-ਪੁਸਤਕ ਵਿੱਚੋਂ ਅੱਠ ਅਖਾਉਤਾਂ ਦੇ ਕੇ ਉਹਨਾਂ ਵਿੱਚੋਂ ਪੰਜ ਨੂੰ ਵਾਕਾਂ ਵਿੱਚ ਵਰਤਣ ਜਾਂ ਉਹਨਾਂ ਦੀ ਵਰਤੋਂ ਦੀਆਂ ਸਥਿਤੀਆਂ ਦੱਸਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।  
2+2+2+2+2=(10)
- ਪ੍ਰਸ਼ਨ ਨੰ.5 ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ-12, ਪਾਠ-ਪੁਸਤਕ ਵਿੱਚ ਦਿੱਤੀਆਂ ਪੰਦਰਾਂ ਕਵਿਤਾਵਾਂ ਵਿੱਚੋਂ ਤਿੰਨ ਕਵਿਤਾਵਾਂ ਦੇ ਕੇ ਕਿਸੇ ਇੱਕ ਦਾ ਕੇਂਦਰੀ-ਭਾਵ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। (10)
- ਪ੍ਰਸ਼ਨ ਨੰ.6 ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ-12, ਪਾਠ-ਪੁਸਤਕ ਵਿੱਚ ਦਿੱਤੀਆਂ ਪੰਜ ਕਹਾਣੀਆਂ ਵਿੱਚੋਂ ਦੋ ਕਹਾਣੀਆਂ ਦੇ ਕੇ ਕਿਸੇ ਇੱਕ ਦਾ ਸਾਰ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। (10)

### 3. PUNJAB HISTORY AND CULTURE

#### Structure of Question Paper

One Paper

Time : 3 Hours

Max. Marks : 75

1. There will be eighteen questions in all. All the questions will be compulsory.
2. Questions from 1 to 10 will carry 2 marks each. Answer to each question should be in about 20-25 words.
3. Questions from 11 to 15 will carry 5 marks each Answer to each question should be in about 80-85 words.

4. Questions from 16 to 18 will carry 10 marks each. Answer to each question should be in about 250-300 words. There will be 100% internal choice in these questions. The paper setter should not set more than one such question from one chapter.
5. The language of paper should be straight.
6. No question will be based on quotation.
7. The question paper will cover the whole syllabus.

### **SYLLABUS**

1. The Great Mughals and their legacy to the Punjab.
2. Guru Nanak Dev Ji.
3. Successors of Guru Nanak Dev Ji.
4. Banda Bahadur and his Martyrdom.
5. Sikhs became Masters of the Punjab.
6. The Punjab under Maharaja Ranjit Singh.
7. The British occupation of the Punjab.
8. Some famous Legends of the Punjab.
  - (i) Puraan Bhagat
  - (ii) Heer Ranjha
  - (iii) Sohni Mahiwal
9. Classical Literature of the Medieval period.

## **4. ENVIRONMENTAL EDUCATION**

**Theory Paper**  
**Project Work**

**Time : 2 Hours**  
**Time : 1½ hrs.**

**Max. Marks : 35**  
**Marks : 15**  
**Total Marks : 50**

### **THEORY**

#### **Structure of Question Paper**

1. There will be one theory paper comprising of 16 questions. All questions will be compulsory.
2. Question Nos. 1-5 are very short answer type questions carrying 1 mark each. Answer to each question will be in one line or few words only.
3. Question Nos. 6-10 are short answer type questions carrying 2 marks each. Answer to each question will be in 20-30 words.
4. Question Nos. 11-15 are short answer type questions carrying 3 marks each. Answer to each question will be in 40-50 words.

5. Question Nos. 16 is long answer type questions carrying 5 marks. Answer to this question will be in 80-100 words.
6. In question No. 16, there will be 100% internal choice.
7. There will be no objective type questions such as yes/no. tick/cross, fill in the blanks, multiple choice, true/false etc.
8. The question paper should be strictly from the prescribed syllabus based on above mentioned guidelines.
9. Unitwise distribution of marks will be as follows

Unit I	Biodiversity	7 marks
Unit II	Environmental Management	7 marks
Unit III	Sustainable Development	7 marks
Unit IV	Sustainable Agriculture	7 marks
Unit V	Environmental Actions	7 marks

### **SYLLABUS**

1. Biodiversity
2. Concept and value of biodiversity.
3. Levels of biodiversity-species, eco and genetic.
4. Balance in nature.
5. Biodiversity for sustenance of mankind.
6. Resource limitations.
7. Ecological role of biodiversity.
8. Interdependence between different species.
9. India as a mega diversity nation.
10. Economic potential of biodiversity.
11. Loss of biodiversity-threatened, endangered and extinct species.
12. Strategies for conservation of biodiversity-in situ and ex-situ.
13. Mitigating the people-wildlife conflict.

#### **Unit II Environmental Management**

- Need for environmental management vis-à-vis development.
- Aspects of environmental management-ethical, economic, technological and social.
- Legal provisions for environmental management.
- Approaches for environmental management-economic policies, environmental indicators, setting of standards, information exchange and surveillance.

**Unit III Sustainable Development**

- Concept of sustainable development.
- Concept of sustainable consumption.
- Need for sustainable development for improving the quality of the life for the present and future.
- Challenges for sustainable development- social, political and economic considerations.
- Support base for sustainable development- political and administrative will, dynamic and flexible policies, appropriate technologies, comprehensive review and revision mechanism humane approach.
- Development of skilled manpower.
- Role of individual and community.
- Role of national and international agencies (both governmental and non-governmental).

**Unit IV Sustainable Agriculture**

- Need for sustainable agriculture.
- Green revolution-impact on environment.
- Importance of soil for crops.
- Irrigation systems, use of manure and fertilizers.
- Crop protection-major plant pests and diseases (wheat, rice, cotton, sugarcane, potato), measures for their control-agrochemicals.
- Impact of agrochemicals on environment.
- Elements of sustainable agriculture-mixed farming, mixed cropping, crop rotation, biological and economic considerations, use of bio-fertilisers and bio-pesticides, biological pest control, integrated pest management.
- Applications of biotechnology in crop improvement.
- Management of agriculture produce-storage, preservation, transportation and processing.

**Unit V Environmental Actions**

- Meeting basic human needs-food, water, shelter and fuel for all.
- Population control.
- Changing consumption patterns.
- Prevention and control of environmental pollution.
- Waste management-reduce, re-use recycle.

- Community movements for ecological restoration and conservation of environment like Van Mahotsava, Chipko, Silent Valley, Project Tiger, Ganga Action Plan, Joint Forestry Management (JEM), students participation in tree rearing, social and agroforestry.

## **PROJECT WORK**

**Time : 1½ hrs.**

**Two Projects 5 marks each**

**Viva**

**Marks : 15**

**10 marks**

**5 marks**

### **Exemplar Projects and Activities**

It is expected that students will undertake two projects or activities, one of which should be undertaken individually, and they will prepare a report in each case. Teachers may plan and design projects and activities depending upon the local situation, available resources and environmental issues of concern. The projects and activities given below are only suggestive and not prescriptive.

- To study the impact of changes in agricultural practices or animal husbandry including poultry, piggery, fishery and apiculture over a period of time on the local environment of a given locality or village. The components for analysis may include, types of crops, land area under cultivation mechanization, use of electricity, mode of irrigation and agrochemicals, agro-wastes and their disposal, types of animal breed and their feed, types of shelter and health care, methods of preservation and processing of products and animal wastes and their disposal. To suggest an action plan for modifying the prevailing practices so as to make them environment friendly and sustainable.
- To study the practices followed in the region for storage, preservation, transportation and processing of perishable or non-perishable farm products and to assess the extent of their wastage due to faulty practices.
- To study the status of an endangered species listed for region by collecting information through different sources and observation, if possible and to assess the reasons for its diminishing number. Suggest ways and means to protect the species.
- To conduct a survey of plants and trees in the locality and collect information about their cultural, economic and medicinal values from the local people and the available literature. To prepare and action plan for the propagation of trees that is most valuable in terms of their cultural, economic and medicinal use.
- To make a list of raw materials used by the family for preparing different types of dishes. To identify the plants and animals and their parts from which each food material is obtained. Also to make a list of plants on which

the animals in the list depend for their food. To name the processes, if any, in which action of microorganisms is made use of. To identify those plants and animals which are found in the locality. To prepare a report supported by diagrams/photographs/ pictures/ graphs to focus on the importance of biodiversity in providing food to human population.

## ਕੰਪਿਊਟਰ ਸਾਇੰਸ

ਪਾਠ-ਕ੍ਰਮ

ਅੱਠਵੀਂ ਤੋਂ ਬਾਰ੍ਹਵੀਂ ਸ਼੍ਰੇਣੀਆਂ ਲਈ

ਪਿੱਠ-ਭੂਮੀ

ਜਮਾਤ ਸੱਤਵੀਂ

### 1. ਕੰਪਿਊਟਰ ਦੇ ਮੂਲ ਸਿਧਾਂਤ :

ਕੰਪਿਊਟਰ ਬਾਰੇ ਜਾਣ-ਪਛਾਣ ਇਸਦੀ ਮਨੁੱਖਾਂ ਨਾਲ ਤੁਲਨਾ

ਕੰਪਿਊਟਰ ਇੱਕ ਸਿਸਟਮ ਹੈ

ਕੰਪਿਊਟਰ ਸਿਸਟਮ ਕਿਵੇਂ ਕੰਮ ਕਰਦਾ ਹੈ

### 2. ਸਧਾਰਨ ਮੰਤਵ ਕੰਪਿਊਟਰ ਸਿਸਟਮ :

ਸਧਾਰਨ ਮੰਤਵ ਕੰਪਿਊਟਰ ਸਿਸਟਮ

ਹਾਰਡਵੇਅਰ ਅਤੇ ਸਾਫਟਵੇਅਰ : ਸਾਫਟਵੇਅਰ ਦਾ ਵਰਗੀਕਰਨ

ਇਨਪੁੱਟ/ਆਊਟਪੁੱਟ

ਮੈਮਰੀ

ਪ੍ਰੋਸੈਸਰ, ਪ੍ਰੋਸੈਸਰ ਬਣਤਰ

ਸਾਫਟਵੇਅਰ ਸਿਸਟਮ : ਭਾਸ਼ਾ ਅਨੁਵਾਦਕ, ਲਿੰਕਰਜ, ਲੋਡਰਜ, ਓਪਰੇਟਿੰਗ ਸਿਸਟਮ

### 3. ਤੁਹਾਡਾ ਕੰਪਿਊਟਰ ਨੂੰ ਚਲਾਉਣਾ

ਕੰਪਿਊਟਰ ਸਬ ਸਿਸਟਮਾਂ ਨੂੰ ਆਪਸ ਵਿੱਚ ਜੋੜਨਾ

ਕੰਪਿਊਟਰ ਨੂੰ ਚਾਲੂ ਕਰਨਾ

ਕੰਪਿਊਟਰ ਨੂੰ ਬੰਦ ਕਰਨਾ

### 4. ਸੂਚਨਾ ਅਤੇ ਸੰਚਾਰ ਤਰਨਾਲੋਜੀ :

ਨੈਟਵਰਕ ਵਿੱਚ ਪਿੰਟਰ ਦਾ ਕਈ ਕੰਪਿਊਟਰਾਂ ਨਾਲ ਹਿੱਸਾ ਵੰਡਾਉਣਾ

ਇੰਟਰਨੈਟ ਐਕਸਪਲੋਰਰ

ਵਰਡ ਪ੍ਰੋਸੈਸਰ : ਕਲਿਪ ਗੈਲਰੀ, ਹਾਈਪਰਲਿੰਕ, ਵਰਡ ਦਸਤਾਵੇਜ਼ ਵਿਚ ਮੌਜੂਦਾ ਧੁਨੀ ਭਰਨਾ, ਚਿੰਨ੍ਹ, ਸਮੀਕਰਨ, ਸਾਰਨੀ, ਡਾਕ ਮਿਲਾਉਣਾ, ਵਰਡ ਡੇਟਾ ਸਾਧਨ ਵਿਚੋਂ ਸੂਚਨਾਂ ਤੇ ਝਾਤ ਪਾਉਣੀ

**5. ਡੇਟਾ ਗ੍ਰਾਫਿਕ ਨਾਲ ਖੇਡਣਾ :**

ਡੇਟਾ ਅਤੇ ਗ੍ਰਾਫਿਕ

ਗ੍ਰਾਫਿਕਸ ਦੇ ਐਪਲੀਕੇਸ਼ਨਜ਼ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀ ਵਰਤੋਂ

**6. ਡੇਟਾਬੇਸ ਮੈਨੇਜਮੈਂਟ**

ਡੇਟਾਬੇਸ ਮੈਨੇਜਮੈਂਟ ਸਿਸਟਮ ਨਾਲ ਜਾਣ-ਪਛਾਣ

ਡੇਟਾ ਮਾਡਲ

**7. ਸਮੱਸਿਆ ਦਾ ਸੁਲਝਾਉਣਾ**

ਐਲਗਾਰਿਥਮ

ਫਲੋਚਾਰਟ ਅਤੇ ਇਸ ਦੇ ਚਿੰਨ੍ਹ

ਫਲੋਚਾਰਟ ਦੇ ਢਾਂਚੇ

**8. ਲੋਗੋ :**

ਭੂਮਿਕਾ, ਲੋਗੋ ਦੀ ਸ਼ੁਰੂਆਤ, ਲੋਗੋ ਦੀ ਪ੍ਰਿਮਿਟਿਵਜ਼

## ਜਮਾਤ ਅੱਠਵੀਂ

**1. ਕੰਪਿਊਟਰ ਮਸ਼ੀਨਾਂ ਦਾ ਵਿਕਾਸ**

ਗਿਣਨ, ਹਿਸਾਬ ਲਾਉਣ ਅਤੇ ਕੰਪਿਊਟਿੰਗ ਕਰਨ ਵਾਲੀਆਂ ਮਸ਼ੀਨਾਂ ਦੀ ਸ਼ੁਰੂਆਤ

ਕੰਪਿਊਟਰਾਂ ਦਾ ਵਿਕਾਸ

ਕੰਪਿਊਟਰਾਂ ਦੀਆਂ ਜੈਨਰੇਸ਼ਨਜ਼

ਹੋਰ ਕਿਸਮਾਂ ਦੇ ਕੰਪਿਊਟਰ

**2. ਹਾਰਡਵੇਅਰ ਅਤੇ ਸਾਫਟਵੇਅਰ**

ਕੰਪਿਊਟਰ ਵਿਚ ਸੂਚਨਾ ਦਾ ਫਲੋ

ਸੀ.ਪੀ.ਯੂ. ਕੈਬਨੇਟ ਦੇ ਅੰਦਰ

ਕੰਪਿਊਟਰ ਭਾਸ਼ਾਵਾਂ

ਭਾਸ਼ਾ ਪਰਿਵਰਤਕ

ਮਸ਼ੀਨ ਵਿਚਲਾ ਕ੍ਰਮ

ਦੋ ਸਟੇਟ ਲੌਜਿਕ ਨਾਲ ਜਾਣ ਪਛਾਣ

### 3. ਆਪਰੇਟਿੰਗ ਸਿਸਟਮ (ਐ/ਐਸ)

ਜਾਣ ਪਛਾਣ

ਐ/ਐਸ ਦੀ ਭੂਮਿਕਾ

ਸ੍ਰੋਤ ਮੈਨੇਜਰ

ਬੱਫਰਸ

ਸਪੂਲਿੰਗ

ਸੂਚਨਾ ਵਿਹਾਰਕਤਾ ਲਈ ਆਪਰੇਟਿੰਗ ਸਿਸਟਮ

### 4. ਸੂਚਨਾ ਅਤੇ ਸੰਚਾਰ ਤਕਨੀਕੀ

ਜਾਣ-ਪਛਾਣ

ਡਾਟਾ ਸੰਚਾਰ

ਸੰਚਾਰ ਚੈਨਲ

ਨੈਟਵਰਕਿੰਗ ਕੰਪਿਊਟਰਾਂ ਲਈ ਲੋੜੀਂਦੇ ਸਾਧਨ

ਨੈਟਵਰਕ ਟੋਪੋਲੋਜੀ

ਸੰਚਾਰ ਅਤੇ ਸੰਪਰਕਤਾ ਦੀਆਂ ਵਿਧੀਆਂ

ਸੰਪਰਕਤਾ

ਸੰਚਾਰ ਉਪਕਰਣ

ਈ-ਮੇਲ

ਨੈਟੀਕੁਐਟਸ

ਨਿਊਜ਼ਗਰੁਪ

ਕਾਨਫਰੈਂਸਿੰਗ

ਇੰਟਰਲੈਨ ਚੈਟਿੰਗ

ਸਾਫਟਵੇਅਰ ਉਤਾਰਨਾ

### 5. ਪ੍ਰਸਤੁਤੀ ਪੈਕੇਜਿਜ਼

ਜਾਣ-ਪਛਾਣ

ਪਾਵਰਪੋਆਇੰਟ ਸਕਰੀਨ ਤੱਤ

ਨਵੀਂ ਪ੍ਰਸਤੁਤੀ

ਹੋਰ ਸਲਾਇਡਾਂ ਵਧਾਉਣਾ

ਡਿਜ਼ਾਇਨ ਟੈਂਪਲੇਟਸ

ਪਾਵਰ ਪੋਆਇੰਟ ਫਾਇਲ ਦਾ ਨਾਂ ਰਖਣਾ  
 ਮੌਜੂਦ ਪ੍ਰਸਤੁਤੀ ਖੋਲ੍ਹਣਾ  
 ਪ੍ਰਸਤੁਤੀ ਸੇਵ ਕਰਨਾ  
 ਪਾਵਰ ਪੋਆਇੰਟ ਵਿਚ ਵਿਭੰਨ ਦ੍ਰਿਸ਼  
 ਪ੍ਰਸਤੁਤੀ ਪ੍ਰਿੰਟ ਕਰਨਾ  
 ਐਨੀਮੇਸ਼ਨ  
 ਸਲਾਇਡ ਟਰਾਂਜਿਸ਼ਨਜ਼  
 ਟੇਬਲਜ਼  
 ਆਪਣੀਆਂ ਸਲਾਇਡਾਂ ਵਿਚ ਚਾਰਟ ਵਰਤਣਾ  
 ਸਲਾਇਡਾਂ ਵਿਚ ਦਸਤਾਵੇਜ਼ ਦਾਖਲ ਕਰਨੇ  
 ਬਣੀਆਂ ਬਣਾਈਆਂ ਪ੍ਰਸਤੁਤੀਆਂ  
 ਮਲਟੀਮੀਡੀਆ  
 ਸੰਗੀਤ ਅਤੇ ਆਵਾਜ਼ ਦੇ ਪ੍ਰਭਾਵ ਵਧਾਉਣੇ  
 ਵੈਬ ਪੇਜ ਦੇ ਤੌਰ ਤੇ ਪ੍ਰਸਤੁਤੀ ਸੇਵ ਕਰਨਾ

## 6. ਡਾਟਾ ਬੇਸ ਪ੍ਰਬੰਧ

ਡਾਟਾਬੇਸ ਦਾ ਪ੍ਰਬੰਧ-ਡਾਟਾਬੇਸ ਪ੍ਰਬੰਧ ਸਿਸਟਮ  
 ਡਾਟਾਬੇਸ ਦੀ ਸਾਂਭ ਸੰਭਾਲ ਅਤੇ ਪ੍ਰਬੰਧ  
 ਫਾਕਸਪ੍ਰੋਅ ਡਾਟਾਬੇਸ ਰਾਹੀਂ ਕੰਮ ਕਰਨਾ  
 ਡਾਟਾਬੇਸ ਬਣਾਉਣਾ  
 ਡਾਟਾਬੇਸ ਫਾਇਲਾਂ ਖੋਲ੍ਹਣਾ ਅਤੇ ਬੰਦ ਕਰਨਾ  
 ਡਾਟਾਬੇਸ ਟੇਬਲ ਦੀ ਬਣਤਰ ਬਦਲਣਾ  
 ਡਾਟਾਬੇਸ ਟੇਬਲ ਵਿੱਚ ਰਿਕਾਰਡ ਜਮਾਂ ਕਰਨਾ  
 ਫਾਕਸਪ੍ਰੋਅ ਵਿਚੋਂ ਨਿਕਲਣਾ  
 ਡਾਟਾਬੇਸ ਟੇਬਲ ਵਿਚੋਂ ਰਿਕਾਰਡ ਦੇਖਣਾ  
 ਡਾਟਾਬੇਸ ਟੇਬਲ ਵਿਚੋਂ ਰਿਕਾਰਡ ਲਭਣਾ  
 ਕਿਸੇ ਵਖਰੀ ਫਾਇਲ ਵਿਚੋਂ ਹੁਣੇ ਖੋਲ੍ਹੀ ਡਾਟਾਬੇਸ ਫਾਇਲ ਵਿਚ ਰਿਕਾਰਡ ਪਾਉਣਾ  
 ਡਾਟਾਬੇਸ ਟੇਬਲ ਦੇ ਰਿਕਾਰਡ ਬਦਲਣੇ  
 ਡਾਟਾਬੇਸ ਟੇਬਲ ਛਾਟਣਾ

ਡਾਟਾਬੇਸ ਟੇਬਲ ਵਿਚੋਂ ਰਿਕਾਰਡ ਹਟਾਉਣਾ

ਹਟਾਏ ਰਿਕਾਰਡਾਂ ਨੂੰ ਬਹਾਲ ਕਰਨਾ/ਅਣਾਸੰਕੇਤਿਤ ਕਰਨਾ

#### 7. ਸਪਰੈਡਸ਼ੀਟ

ਜਾਣ-ਪਛਾਣ

ਇਲੈਕਟਰੋਨਿਕ ਸਪਰੈਡਸ਼ੀਟ

MS-Excel

#### 8. ਪ੍ਰੋਗਰਾਮਿੰਗ ਸੰਕਲਪ

ਪ੍ਰਬੰਧ ਸੰਕਲਪ

ਪ੍ਰਬੰਧ ਵਿਕਾਸ

ਪ੍ਰਬੰਧ ਵਿਕਾਸ ਜੀਵਨ ਚੱਕਰ

ਟੂਲ ਅਤੇ ਦਸਤਾਵੇਜ਼ ਦੀ ਯੋਜਨਾ

ਐਰੇਜ਼ ਅਤੇ ਐਰੇਜ਼ ਉਤੇ ਅਮਲ

**ਨੋਟ :** ਸਰਕਾਰ ਦੀਆਂ ਹਦਾਇਤਾਂ ਅਨੁਸਾਰ, ਦਾਖਲਾ ਸਾਲ 2009 ਤੋਂ ਕੰਪਿਊਟਰ ਸਾਇੰਸ ਦਾ ਵਿਸ਼ਾ ਛੇਵੀਂ ਤੋਂ ਬਾਰ੍ਹਵੀਂ ਸ਼੍ਰੇਣੀ ਲਈ ਪੜ੍ਹਨਾ ਲਾਜ਼ਮੀ ਕੀਤਾ ਗਿਆ ਹੈ ਜਿਨ੍ਹਾਂ ਸਕੂਲ ਵਿੱਚ ਪਿਕਟਸ ਵੱਲੋਂ ਪਹਿਲਾ ਹੀ ਇਹ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਵਜੋਂ ਪੜ੍ਹਾਇਆ ਜਾ ਰਿਹਾ ਹੈ ਉਥੇ ਉਹ ਹੀ ਪਾਠ-ਕ੍ਰਮ ਚਾਲੂ ਰਹੇਗਾ। ਜਿਹਨਾਂ ਸਕੂਲਾਂ ਵਿੱਚ ਪਹਿਲੀ ਵਾਰ ਇਹ ਵਿਸ਼ਾ ਲਾਗੂ ਕੀਤਾ ਗਿਆ ਹੈ, ਉਨ੍ਹਾਂ ਸਕੂਲਾਂ ਦੇ ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਉਪਰ ਦੱਸਿਆ ਪਾਠ-ਕ੍ਰਮ ਲਾਗੂ ਹੋਵੇਗਾ।

**ਨੋਟ :** ਪ੍ਰੀ-ਵੇਕੇਸ਼ਨਲ ਦੇ ਪਾਠ-ਕ੍ਰਮ ਸਮੈਸਟਰਵਾਇਜ਼ ਵੰਡ ਵੱਖਰੇ ਤੌਰ ਤੇ ਭੇਜੀ ਜਾਵੇਗੀ।

### **D. STRUCTURE OF QUESTION PAPERS OF ELECTIVE SUBJECTS (THEORY)**

**FOR QUESTION PAPERS CARRYING 30 MARKS (THEORY) EACH (EXCEPT THOSE SPECIFIED AT\*)**

**Time : 2 hours**

**M. Marks : 30**

In all eight questions will be set from the prescribed syllabus. Candidates will attempt any five questions out of these. Every question will carry six marks. A question may have two or more parts. The questions will be evenly distributed from the syllabus.

**FOR QUESTION PAPER CARRYING 80 MARKS (THEORY) EACH**

**Time : 3 hours**

**M. Marks : 80**

The structure of question paper having 80 marks theory precedes the syllabus of that particular subject.

**\*SUBJECTS HAVING 80 MARKS THEORY ARE :**

<b>GROUP</b>	<b>TRADE</b>	<b>SUBJECT</b>
Business & Commerce	Accountancy and Auditing -do-	a. Principles of Management and Economics b. Book Keeping and Accountancy
Engineering & Technology	Computer Techniques	Advanced Mathematics & Computer Commercial Applications
Humanities & Others	Commercial Art	Technical Theory of Commercial Art

**E. STRUCTURE OF QUESTION PAPER OF ELECTIVE SUBJECTS (PRACTICAL)**

**FOR QUESTION PAPERS CARRYING 50 MARKS (PRACTICAL) EACH (EXCEPT THOSE SPECIFIED AT\*)**

**Time : 3 hours**

**M. Marks : 50**

Distribution of marks will be as follows :

- |  |          |
|--|----------|
| (i) Practical note book/sessional work/visits/project work | 10 marks |
| (ii) Viva Voce   | 5 marks  |
| (iii) Actual performance                                   | 35 marks |

**No.1 MAJOR PRACTICAL**

**(20 Marks)**

In all three practicals will be asked from the prescribed syllabus. Candidate will be asked to choose any two out of these. The Practical examiner will ask the candidate to perform any one practical out of the two chosen by him.

**No.2 MINOR PRACTICAL**

**(15 Marks)**

In all three practicals will be asked from the prescribed syllabus. Candidate will be asked to choose any two out of these. The examiner will ask the candidate to perform any one practical out of the two chosen by him.

**FOR QUESTION PAPERS CARRYING 80 MARKS (PRACTICAL) EACH :**

The Structure of question paper having 80 marks practical precedes the syllabus of that particular subject.

**\*SUBJECTS HAVING 80 MARKS PRACTICAL ARE :**

<b>GROUP</b>	<b>TRADE</b>	<b>SUBJECT</b>
Engineering and Technology	Engg. Drawing and Drafting	a. Engineering Drawing
	Mechanical servicing (Genl.)	b. Engineering Drawing
Humanities & Others	Commercial Art	a. Commercial Art & Drawing
		b. Design and Lay-out

**F. GENERAL INSTRUCTIONS TO THE PAPER SETTERS  
(THEORY)**

1. The paper should be strictly from the prescribed syllabus or according to guidelines given under the structure of question paper.
2. The language should be simple and to the mental level of the students.
3. The standardized form of the technical terminology should be used.
4. The questions in the paper should be evenly distributed throughout the syllabus.
5. There will not be any objective type question like Yes or No, tick or cross, fill in the blanks, multiple choice etc.
6. Due weightage should be given to numerical problems wherever required.
7. Marks for every part/sub-part should be shown on the question paper itself.

**PRACTICAL**

1. The question paper will be set on the spot by the practical examiner himself.
2. The practical examiner will set the question paper on the spot based upon the instructions & prescribed syllabus. The examiner must send one copy of the question paper for Board's record. The second copy of the question paper must be kept by the examiner.

3. A group of students should be examined in given time.
4. Separate question paper should be set for each group.

### **G. ON-THE-JOB TRAINING**

**Time : 3 weeks**

**M. Marks : 60**

**INTRODUCTION :**

On-the-job training is an essential component of effective Vocational Education and Training. The Heads of Vocational Schools have to play a vital role in this regard.

**IDENTIFICATION OF TRAINING CENTRE :**

The Head of the institution will identify the Training Centres in consultation with liaison agencies and local community. Any reputed Industrial Organisation / Workshop/Office/Shop situated in the neighbourhood of the school can be the training centre.

**GROUPING OF STUDENTS :**

After the identification of Training Centres the Head of school will group the students under the guidance of a group incharge, the concerned vocational master. There should not be more than 10 students in a group.

**DURATION :**

On-the-job training will be for three weeks in all. It can be conducted at more than one centre depending upon the facilities available at the training center/s. The schedule may be framed by the Head of the school in consultation with the competent authority of the training centre/s.

**EVALUATION :**

The competent authority at the training centre will evaluate the conduct, work, aptitude, gained experience, efficiency etc. of the student and will issue the training certificate on the Performance Sheet.

**PREPARATION OF AWARD LIST :**

On the basis of the training, certificate marks will be allotted to the student by the group incharge. These marks will be listed in the Award List against the Roll No. of the student as issued by the Board. The Award List duly countersigned by the Head of the institution will be sent to the Board.

Training certificates of the students should not be sent to the Board. These may issued to the students afte the declaration of their result.

**CERTIFICATION :**

The marks obtained by the student will be reflected in the Detail marks card issued by the Board. On-the-job training will be counted as a subject and it will be compulsory to pass this subject to pass the examination as a whole.

## **I AGRICULTURE GROUP**

### **(i) Horticultural**

**PAPER-I**

**LANDSCAPING AND FLORICULTURE**

**Time : 2 hrs.**

**THEORY**

**M.MARKS : 30**

- Importance, definition, status and scope of landscaping and floriculture.
- History and types of gardens.
- Principles of landscaping.
- Design and layout of gardens for home, school, college, public buildings, modern parks.
- Essential and decorative components and features of gardens-gate, lawn, shrubbery, flower beds, borders, paths, hedges, edges, steps, statues, fountains, bird baths, streams, pools, waterfalls, terraces, rockeries, pergolas, arches and topiary.
- Study of Indoor gardening, Rock gardening.
- Important Ornamental trees, shrubs, climbers and groundcovers, their selection based on landscape value and use, their planting and maintenance.
- Establishment and maintenance of lawns.
- Cultivation of bedding plants, bulbs and pot plants.
- Cultivation of the following flower crops with respect to soil, climate, varieties, propagation, method and time of planting irrigation, weeding, pest control, Time of flowering, harvesting packing and marketing: Rose, chrysanthemum, gladiolus, marigold, camation, tuberose, jasmine.
- Study of the flower arrangements, flower shows and exhibition, packing and storage of cut flowers, Study of cacti and succulents.
- Seed production of important seasonal flowers.
- Marketing of indoor plants and cut flower.
- Gardening operation like staking, disbudding and pinching.

**PAPER-I**

**LANDSCAPING AND FLORICULTURE**

**Time : 3 hours**

**M.MARKS : 50**

**PRACTICAL**

- Identification of Seasonal flowers.

- Preparation of nursery; beds and sowing of seeds of seasonal flowers.
- Planting and maintenance of lawn.
- Identification of landscape trees, shrubs/climbers and ground covers.
- Propagation of rose, chrysanthemum, and marigold.
- Planting shrubbery, hedges and edges.
- Potting and repotting.
- Garden operations- staking, training, pruning, desukering, pinching, disbudding, topiary.
- Harvesting, cleaning, grading and packaging of cut flowers.
- Preparation of garlands and bouquets.
- Arranging pots and materials for special decorations.
- Visits to flower growers fields, gardens and flower shows and markets.
- Landscap plan (i) modern bungalow (ii) Public place (iii) park.

**PAPER-II****COMMERCIAL CROPS****Time : 2 hrs.****THEORY****Max. Marks : 30**

- Introduction, present status and future prospects of plantation, spice, medicinal and aromatic crops.
- Commercial cultivation of the following with respect to soil, climate, improved varieties, propagation and nursery techniques, lay out and planting, cultural practices, water management, weed control, plant protection, harvesting, processing, products, storage and marketing of the following.

**SPICE CROPS** : Cinnamon, ginger, turmeric, fennel, comin and coriander.

**MEDICINAL CROPS** : Dioscorea, periwinkle, sarpagandha, ashwagandha, steroid bearing solanum, isabgol, senna and liquorice, alowera, glow, tulsi, sativia.

**AROMATIC CROPS** : Lemon grass, citronella, palmarosa, vetiver (khus), geranium, patchaouli, davana, mints and rosemary.

**BEE KEEPING** : Importance and scope, bee species and honey bee colony; bee keeping procedures; social behaviour, bee hives and their equipments; apiary management practices; products of bee hive; diseases and enemies of honey bees, pesticidal enemies of bees and economics and marketing of honey.

**MUSHROOMS** : Their types, environmental requirements, containers, media and its preparation, disinfection, seeding, look after and care, harvesting, dehydration and packing. Preparation and maintenance of culture.

**VERMICULTURE** : Introduction, Role of Earthworms, Organic Wastes, Advantages of vermiculture, vermicomposting, application of vermicomposting.

**PAPER-II**

**COMMERCIAL CROPS**

**M. Marks : 50**

**Time : 3 hrs.**

**PRACTICAL**

**Spice Crops**

- Processing and curing of ginger and turmeric

**Medicinal and Aromatic Crops**

- Study of important spice, medicinal and aromatic crops.
- Extraction of essential oils in plants such as Mertha.
- Preparation of plants of geranium and patchouli through cuttings.
- Study of propagation in aromatic grasses.

**Beekeeping**

- Study of honey bees and their products.
- Study of bee pasturage.
- Site selection and arrangement of apiary.
- Setting up be hive.
- Seasonal management of bee colonies.
- Management of pest and diseases of bee.
- Extraction of honey, processing and marketing.

**Mushrooms**

- Study of common cultivated mushrooms and their food value.
- Compost preparation for button mushroom.
- Filling of trays/shelves/bags with compost for button mushroom.
- Spawning in button mushroom.
- Casing in button mushroom.
- Cropping and harvesting of button mushroom.
- Substrate preparation for paddy straw mushroom.
- Bed preparation and spawning in paddy straw mushroom.
- Cropping in paddy straw mushroom.

- Post harvest management.
- Management of insect-pests and diseases.

### **VERMICULTURE**

- Identification of Important species of earthworms.
- Selection of suitable species.
- Vermicomposting materials and feed for earthworms.
- Different schemes for Vermicomposting.
- Preparation and maintenance of Vermicomposting beds.
- Products of cocoons and its survival.
- Application of vermicompost.
- Preparation of vermiwash and its applications.

### **PAPER-III POST HARVEST TECHNOLOGY AND PRESERVATION**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

- Maturity standards for fruits and vegetables.
- Methods of harvesting, handling, grading and transportation.
- Techniques of storage including cold storage of fruits & vegetables.
- Use of growth regulators and wax, emulsions for extending the storage life.
- Importance, scope and present position of preservation industry in India with special reference to Punjab.
- Principles and methods of preservation by low temperature, chemical, additives, salt, sugar, heat and drying.
- Factors affecting spoilage of fruits-role of enzymes and bacteria. Bacterial food poisoning, sulphuring and sulphitation.
- Establishment of processing factory ; consideration, machinery, labour, containers, finance.
- Canning of fruits and vegetables ; Important materials used, Suitable varieties of fruits and vegetables, selection of material, preparation of materials, syruping, exhausting, sealing, sterilization and cooling.
- Preparation and preservation of fruit juice, squashes, cordial syrup, jam, jelly, marmalade and preserve, chutneys, pickles and sauces.
- Drying and dehydration of important fruits and vegetables.
- Evaluation of quality of preserved/ processed products.

## **POST HARVEST TECHNOLOGY AND PRESERVATION**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

- Determination of maturity standards for fruits and vegetables.
- Methods of harvesting, handling, grading and transportation.
- Storage life of fruits and vegetables.
- Preservation of fruits and vegetables by low temperature, chemical additives, salt, sugar, heat and drying.
- Study of spoilage of fruits.
- Visit to a processing factory.
- Preparation and preservation of fruit juices, squashes, cordial syrup, jam, jelly, marmalade and preserve, chutneys, pickles and sauces.
- Drying and dehydration of important fruits and vegetables.
- Canning of fruits and vegetables.

### **(ii) AGRIBUSINESS**

**PAPER-I**

**AGRICULTURAL MARKETING**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

- Basic concepts.
- Definition of market-Marketing.
- Differences between market and marketing.
- Differences between trade, commerce, merchandising and marketing.
- Importance of marketing.
- Classification of markets, on the basis of area, on the basis of time, on the basis of goods/commodities.
- Approaches to Study of Marketing-the functional approach, the institutional approach, the commodity approach and behaviour system or decision making approach.
- Marketing functions-Principal marketing functions, assembling, processing and disperson. Secondary services: grading, packing, transporting, storing, financing, assuming risk and selling.

- Agricultural Marketing systems in India. Defects in the present system of agricultural marketing in India and remedial measures.
- Marketing institutions - Regulated markets, co-operative marketing, state trading, commodity boards, warehousing.
- Agricultural prices-Factors influencing price.
- Management of distribution channels, Market segmentation and marketing mix, Sales promotion tools.

**PAPER-I****AGRICULTURAL MARKETING****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

- Visit to farm holdings to appraise the selling behaviours of farmers.
- Visit to village market to analyse its importance, nature of participants and different transactions.
- Commodity market survey to study different market channels (important five commodities in the locality).
- Study of regulated market, its functions and benefits to accrued farmers.
- Visit to co-operative marketing society to study the genesis, structure, functions and benefits accrued to members.
- Visit to any one commodity board to study its functions.
- Visit to warehousing co-operation to study its functions and services, methods of storage, storage pest control measures.
- Visit to agricultural input distributor to study about his business activities.
- Visit to agricultural input retailer shop to study the business activity.
- Visit to Assistant Director of Agriculture office to know about Fertiliser control order, Pesticide control order.
- Visit to Seed Certificate Office to know about seed act.
- Visit to any one agricultural input firm to study the sales promotion activities.

**PAPER-II****AGRICULTURAL FINANCE****Time : 2 hrs.****THEORY****M. Marks : 30****Agricultural Finance**

- Concept of Agricultural finance, nature, scope and importance of agricultural finance.

- Financial needs of farmers and firms.

### **Financial Institutes**

- Commercial banks, agricultural development branches, history, organization, sources of capital, functions.
- Reserve bank of India-history, organization, functions.
- National Bank for Agricultural and Rural Development (NABARD)- history, organization, functions.
- The Punjab schedule caste Land Development & Finance Corporation.
- The Punjab State Agri. Co-operative Land Development Bank.
- The Punjab State Industrial Development Corporation.
- The Punjab Financial Corporation.
- The Punjab Agro Industry Corporation.
- The Department of Agriculture (Pb.)
- The Department of Horticulture (Pb).

### **PAPER-II**

### **AGRICULTURAL FINANCE**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

- Study of basic concepts used in Agricultural Finance-(Capital Finance, credit, debt, indebtedness, asset, liability, overdues outstanding shares, dividend).
- Study and analysis of forms of repayment.
- Visit to selected commercial banks to study organizational, procedure for financing and repayment schedule.
- Visit to rural banks to study the organizational, procedure for financing and repayment schedule.
- Visits to the Head office/ branch of Punjab Schedule caste Land Development & Finance Corporation to study the organization and procedure for financing.
- Visit to the head office/branch of Punjab State Agri co-operation Land Development Bank to study the organisational and procedure for financing.
- Visit to the head office/branch of Punjab State Industrial Development Corporation to study the organizational & procedure for financing.
- Visit to the head office/branch of Punjab Financial Corporation to study the organization & procedure for financing.
- Visit to the head office/branch of Punjab Agro. Industries Corporation to study the agricultural & procedure for financing.

**PAPER-III****AGRICULTURAL EQUIPMENT****Time : 2 hrs.****THEORY****M. Marks : 30**

- A Farm Power :
- 1 Types of Engines : single and multicylinder diesel engines, brief operations of different systems i.e. fuel systems, lubrication systems, cooling systems.
  - 2 Tractors of various models and brands. Operations of transmission and hydraulic systems of tractors.
  - 3 Types of electric motors and their uses.
- B Tillage Implements:
- 1 Primary tillage implements : proper use of hitching of mould board plough and disc plough.
  - 2 Secondary tillage : Uses of levelers, harrows, cultivators.
- C Seeding Machinery :
- 1 Seed drills, types of drills- plain drills and seed-cum-fertiliser drills.
  - 2 Planters : types & uses of planters
- D Crop Production and Protection Equipment :
- 1 Irrigation, types of pumps i.e. centrifugal, submersible pumps and their suitability to different conditions.
  - 2 Sprayers and dusters; types and their uses, different parts of sprayers and dusters.
  - 3 Safety precautions in handling of chemicals and operative techniques.
- E Harvesting:
- Introduction to Reapers, Threshers and Combines and their operational use.

**AGRICULTURAL FINANCE****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

1. Collection of data regarding various engines available in the market for irrigation purposes.

2. Collection of data regarding various tractor makers, their models and brand names.
3. A study of fuel, cooling and lubrication systems of a given engine.
4. Demonstration of transmission and hydraulic systems of tractors at a site.
5. Collection of data regarding various electric motor makers, their models and brand names available in the local market.
6. Demonstration of hitching practices of various tillage implements at site.
7. Identification of different parts of sprayers.
8. Identification of different parts of dusters.
9. Demonstration of working of sprayers and dusters.
10. Demonstration of working of planters.
11. Collection of data regarding various makers of sprayers and dusters, their models and brand names.
12. Demonstration of working of various special equipments i.e. sugarcane crusher, maize sheller, chaff cutter, groundnut decorticator and rice sheller at the locally available site.

### **(iii) REPAIR AND MAINTENANCE OF POWER DRIVEN FARM MACHINERY**

#### **PAPER-I**

#### **FARM POWER AND TRACTORS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

#### **General:**

- Availability of indigenous tractors, makes and models and horsepowers.
- Role of tractors in farm mechanization.
- Familiarisation with the main components, various gauges, instruments and controls of tractors.
- Safety in driving of tractors and road signals.

#### **Engine :**

- Constructional features of I.C. engines and familiarization with principal parts.
- Principles of operation and salient features of four stroke and two stroke engines.
- Multicylinder engines, firing orders and valve arrangements.
- Fuel system : major parts of a fuel system, system of fuel injection, different parts of injection pumps and injectors and their functions.
- Governing system : function of a Governor, Principles of operation and classification.

- Lubrication system, necessity of lubrication, functions of lubricating oils, properties and grades, different lubricating systems; crankcase ventilation.
- Cooling system, its necessity, requirement of an efficient cooling system, types and different parts of a cooling system and their functions.
- Intake and exhaust systems & their necessity, different components of an air intake system and exhaust system & their functions. Supercharger and its functions.
- Electrical system, different components of an electrical system and their functions.
- Engine trouble shooting; familiarisation with possible causes of troubles and their remedies.

#### **Power Transmission**

- Clutch function, types of clutches, various components and working of single and dual clutch systems; clutch adjustment.
- Gear box; Principles of gearing, types of gear boxes, different components; speed ratio.
- Differential & final drive, principles of operation, functions of a differential lock.
- P.T.O drive, its position and operational control.

#### **Other Systems :**

- Steering system and front axle ; different components of the system, types of steering gear box on different makes of tractors.
- Brakes; function of a brake system; classification of brakes their working with emphasis on hydraulic brake system.
- Tyres, tubes and wheel ballasting, constructional features of pneumatic tyres, size and ply rating, air inflation techniques; size of rims retreading of tyres, need of ballasting.

#### **Hydraulic & Hitch System :**

- Hydraulic & hitch system, their necessity, different components, assemblies & controls of hydraulic system & hitch system and functions, Merits of hydraulic system over mechanical system. Brief description of matching tools & machines.

## **FARM POWER AND TRACTORS**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Familiarisation with various matching tools and machines used in maintenance & repair of tractors.
2. Familiarisation with different components, gauges & controls of tractors.

3. General cleaning, oiling & greasing of tractors.
4. Checking & tightening of nuts & bolts, checking: fuel, oil, cooling systems & battery checking and inflating tyres.
5. Identification of different parts of an engine.
6. General precautions and observations while starting running & stoping of engines.
7. Observation of different gauges & controls for proper functioning.
8. Driving practice in forward & reverse.
9. Engine trouble shootings causes & their remedies.
10. Common defects & remedies of different systems of a tractor.
11. Repairing tyre puncture & practice in liquid tyre blasting.
12. Hitching the implements.
13. Practice in trolley reversing.
14. Familiarisation with road signals and driving practice on road.
15. To develop competency in reading part and service catalogue and maintenance of log books & history sheets.
16. Visit to repair & servicing workshop to familiarize with the techniques of crank-stet grinding, honing, pump calibration etc.

## **POST HARVEST MACHINERY AND RENEWABLE ENERGY GADGET**

**Paper-II**

**THEORY**

**Time : 3 Hours**

**Time : 2 hrs.**

**M. Marks : 30**

### **Post Harvest Machinery**

- Introduction to post-harvest technology and its importance.
- Definition of different terms like cleaning, grading, sorting, drying and dehydration, storage, milling, handling, packaging & transportation, proximate composition, engineering properties etc. used in unit operation in post-harvest.

### **Cleaning and grading machinery**

- Definition of cleaning, grading, dockage, foreign matter, size, shape, specific gravity, terminal velocity, coefficient of friction and angle of repose.
- Types of commonly used cleaners and grader like air screen cleaners, rotary cleaners, vibratory screen cleaners, disc separator, indentend cylinder separator, spiral separator, specific gravity separator, magnetic separator, cyclone separator, their uses and suitability to different farm produce.
- Components of cleaners and graders like hopper, sieves, blower, oscillating mechanism etc., their functions, materials of construction and functional requirements.

- Installation of cleaning and grading machinery.
- Adjustment and alignment of feed rate, sieve selection (mesh number of screen), slope of sieves, air flow rate, frequency and amplitude of oscillations for optimum efficiency.
- Common faults and corrective measures.
- Safety and precaution in use of cleaners and graders.

### **Drying Equipment/Machinery**

- Definition of drying and related terms like moisture content, bound moisture, unbound moisture, free moisture, thin layer drying, dry bulb temperature, wet bulb temperature, relative humidity etc. Advantages of drying form produce and safe moisture contents for storage.
- Drying methods-convection drying, conduction drying, vacuum drying and their uses. Commonly used dryers like flat bed type batch dryer, Louisiana State University (LSU) dryer, rotary dryer, tray dryer, spray dryer, their uses and suitability to different form produce.
- Parts of drives like drying chamber, air distribution system, direct or indirect heating system-their functions, material of construction and functional requirements.
- Installation of drives.
- Adjustment of drying air temperature, air flow rate, grain flow rate etc. for efficient use of dryers.
- Common faults and their rectification.
- Safety and precaution in use of dryers.

### **Milling Machinery**

- Definition of milling and terms like cleaning, mixing, pearling, hulling, polishing, dehusking, sorting, size reduction, size, average particle size, screen analysis.
- Types uses and commonly used flour mills, spice mills like burr/plate/attrition mill, hammer mill, ball mill, dal mills like abrasive roller mill and roller mill and rice mills/hullers like engleberg huller, rubber roll sheller, under runner disc huller, centrifugal dehusker and vertical cone whitener.
- Introduction to flour mills like burr mill and roller flour mill, spice mills, dal mills, and rice mills/hullers like traditional rice hullers and modern rice mills.
- Installation of milling machinery.
- Adjustment/alignment of spacing between plates, rpm, screen size, gap between rubber rolls, and spacing between emery rollers/cane and screen etc., for efficient use of mills. Common faults and corrective measures in the mills.
- Safety and precaution in use of miling machinery.
- Components of flour mills, dal mills and rice mills/hullers; their functions, material of construction and functional requirements.

**Sugarcane Crushers**

- Introduction to different types of commonly used cane crushers like smooth roll crusher and serrated or toothed roll crusher.
- Main parts of cane crushers like rollers, gear assembly, feeding assembly, feeding mechanism etc., and their functions and operation of crushers.
- Installation of sugarcane crushers.
- Adjustment/alignment of gap between rollers, spring load and rpm for optimum use of crushers.'
- Common faults and corrective measures.
- Safety and precaution in use of cane crushers.

**Chaff Cutters**

- Introduction to different types of commonly used hand and power operated chaff cutters.
- Main parts of chaff cutter like feeding rollers, fly wheel, cutting blades and feeding mechanism and their functions.
- Installation of chaff cutters.
- Adjustment/alignment of feeding rollers, cutting gap; and other systems for their efficient uses.
- Common faults and corrective measures.
- Safety and precautions in use of chaff cutters.

**Maize Shellers and Groundnut Decorticators**

- Introduction to commonly used manual and power operated maize shellers and groundnut decorticators.
- Main parts of maize shellers and groundnut decorticators and their functions and operation.
- Adjustment/alignment of various components of maize shellers and groundnut decorticators for their efficient uses.
- Common faults and their rectification.
- Safety and precaution in use of maize shellers and groundnut decorticators.

**Renewable Energy Gadgets**

- Introduction to renewable energy and its importance.
- Different types of renewable energy gadgets - such as solar, biogas, wind mills and chulhas.

**Solar Gadgets**

- Working principles of solar gadgets.

- Introduction to different solar gadgets such as solar cookers, solar water heaters, solar photovoltaic panels and solar dryers, etc.
- Types of commonly used solar cookers, solar water heaters, solar dryers and photovoltaic panels.
- Components of solar cookers (such as reflector, boxes, insulation etc.), solar water heaters, solar photovoltaics and solar dryers their functions.
- Adjustment/orientation/alignment of solar gadgets for their efficient uses.
- Common faults and corrective measures.
- Safety and precautions in use of solar gadgets.
- Repair and routine maintenance of solar gadgets.

### **Biogas Plants and Appliances**

- Working principles of biogas plants and commonly used substance for biogas production.
- Introduction to different types of biogas plants such as KVIC, fixed dome type and appliances viz. burners, lantern, engines and uses.
- Main components of biogas plants (digester, inlet, outlet, gas holder/dome, etc.) and their functions.
- Gas conveyance pipe lines and water draining devices.
- Installation and commissioning of biogas plants and appliances.
- Common faults and corrective measures.
- Repair and routine maintenance of biogas plants.

### **Wind mills and Matching Devices**

- Working principles of Wind mills and advantage of wind energy utilization.
- Introduction to different types of wind mills (horizontal axis, vertical axis) and matching devices (such as pump, aerator, aero-generator) and their suitability.
- Main components of wind mills blades, transmission mechanism, rudder etc. and their matching devices and their functions.
- Adjustment/orientation/alignment different types of wind mills and their efficient workability.
- Common faults and corrective measures.
- Safety and precaution in use of wind mills.
- Installation of wind mills and matching devices.

### **Smokeless chulhas/improved stoves**

- Advantages of using improved chulhas.
- Types of improved chulhas (fixed, portable, single mouth, two mouth, three mouth).
- Main parts of improved chulhas (combustion chamber, chimney, cobble, air supply system) and their functions.
- Adjustment of different components of improved chulhas for their efficient use.
- Common faults and remedial measures.
- Safety and precaution in use of improved chulhas.
- Repair and maintenance of improved chulhas.

## **POST HARVEST MACHINERY AND RENEWABLE ENERGY GADGET**

### **Paper-II**

### **PRACTICAL**

**Time : 3 hrs.**

**M. Marks : 50**

- Identification of different parts and components of commonly used cleaners and graders, their adjustments, operation and functions.
- Identification of different parts and components of drying equipments/ machinery, their adjustment, operation and functions.
- Familiarisation and identification of different parts and components of commonly used flour mills, spice mills, dal mills and rice mills/hullers, function of different parts and their adjustment for efficient use and operation.
- Familiarisation and identification of different parts of components of commonly used sugarcane crushers, function of different parts and their adjustment for efficient operation.
- Familiarisation and identification of different components of commonly used chaff cutters, function of different parts and their adjustment for efficient use.
- Familiarisation and identification of different components of commonly used maize shellers, function of different parts and adjustment for efficient use.
- Familiarisation and identification of different parts of components of commonly available solar cooker, solar water heater, solar photovoltaics and solar dryers, function of different parts and adjustment for their efficient use.
- Familiarisation and identification of different components of biogas plants and appliances, function of different parts, routine repair and maintenance of biogas appliances.
- Familiarisation and identification of different parts and components of commonly available wind mills and matching devices, their function adjustment for harnessing of wind energy.
- Familiarisation and identification of different parts and components of smokeless chulhas, function of different parts and adjustment for their efficient use.

## **MANAGEMENT OF FARM POWER AND MACHINERY**

**Paper-III**

**THEORY**

**Time : 2 hrs.**

**M. Marks : 30**

### **Factors in Analysis of Cost of Operation:**

- Fixed cost: initial cost, salvage value, useful life, depreciation, interest, taxes and insurance, housing.
- Variable cost: repair and maintenance, fuel and oil consumption, wages.
- Theoretical and actual field capacities, field efficiency.
- Methods of improving field efficiencies.

### **Purchase and Disposal**

- Methods of purchase : Quotation, tender, spot purchase.
- Comparative statement: Technical specifications, costs and charge, terms and conditions of payment and delivery.
- Placement of purchase order: description of stores, part number if any, quantity required, price per unit, insurance, mode of shipment.
- Receipt of stores, verification and inspection: receipt with all documents, verification of quantity and inspection of quality, entry in records, preparing inspection notes, rejection/shorting note.

### **Storage of Materials, Machines and Supplies**

- Criteria for location of stores, layout for stores & racks, types of racks, preservation of stores from white ants, rats, rusting, fire & mechanical damage, care in stacking, types of fire fighting equipment, importance of lighting & verification.

### **Record Keeping**

- Importance of maintaining record, various records such as stock register, issue register, register of unserviceable items, issue vouchers, bin card, identification tag, history sheet of machines, job card.

### **Accounts Keeping**

- Terms such as profit, debit, credit, asset, liability, capital, familiarisation with cash balance, profit and loss account, balance sheet, voucher, proforma invoice.

### **Marketing, Sales, and Custom Hiring**

- Assessing of the customer need, displaying of merchandise, packaging and billing, after Sales services, securing interviews, conducting demonstration.

### **Publicity and Advertising**

- Importance of Publicity and advertising, media of advertising and comparative cost and advantages and disadvantages, advantages of Publicity and display in fairs, field days, exhibitions and demonstrations.

### **Consultancy**

- Consultancy services and training organizations, essential information in a project report for securing loan and establishing an enterprise.

## **MANAGEMENT OF FARM POWER & MACHINERY**

### **Paper-III**

### **PRACTICAL**

**Time : 3 hrs.**

**M. Marks : 50**

- Calculating cost per hour/per hectare of tractors, power tillers, engine, and various agricultural implements and machines.
- Filling up quotation and tender forms, preparing comparative statement, filling up of a specimen. Purchase order, familiarization with inspection note, identification tag, rejection shorting note filing up a bin card, visit to a store.
- Laying out a store, fabricating racks; practice in applying rust compounds, familiarization with fire extinguishers, visit to a store.
- Familiarisation with different records, visit to a store.
- Preparing a profit and loss account (refer Appendix on sample project report), Visit to a manufacturer's account section.
- Preparing a demonstration of an implement or machine, preparing a list of after sale service, familiarize with methods of packaging and billing, visit to a show room and a Farmers' Fair.
- Visit to an advertising agency, visit to fairs, field days, exhibition and demonstration, preparation of a poster for publicity.
- Visit to a consultancy services and a training organization, familiarization with forms and procedures for securing loans.

## **II BUSINESS AND COMMERCE GROUP**

### **(i) OFFICE SECRETARYSHIP Modern Office Practices - II**

**Paper-I**  
**Time : 2 hrs.**

**Theory**

**M. Marks : 30**

**Part I**

**Unit-I Office Communication**

- Meaning and Importance of Effective Communication.
- Ways of Communication. Verbal (Written, spoken) and non-verbal communication, internal and external communication-Their importance in different setting and their disadvantages.
- Tools of Communication: Letter, Telephone, Extension PBX, Intercom, facsimile, e-mail, video conferencing, etc.,
- Postal Services: Different modes of sending letters, parcels, telegrams, and packets, courier, speed post.
- Introduction to Internet : Concept of Internet, Use of Internet, Browsing the Internet, Procedure of opening e-mail account on Internet, communicating with e-mail.

**Unit-II Office Manuals and Procedures**

- Meaning of office manual.
- Manual in use.
- Information to be included in the manual.
- Meaning of office procedure.
- Developing a procedure.
- Knowledge of various standard symbols used in office procedure.

**Part-II**

**Unit-III Training in Human Relations**

- Relations with the public
- Relations with the superiors/subordinates
- Relations with the fellow employees.

**Unit-IV Secretarial work in relation to Meeting and Conferences**

- Committee procedure for conducting meetings.
- Notice, Agenda, Quorum, Minutes and Adjustment.
- Noting.
- Resolutions.

**Paper-I****MODERN OFFICE PRACTICE-II****Practical****Time : 3 hrs.****M. Marks : 50**

1. Communications skills-Resume writing and application for jobs.
2. Log into Internet.
3. Navigation for seeking information.
4. Sending and receiving e-mail; Creating e-mail accounts, creating a message, creating new address book, attaching file(s)/ photo(es) with e-mail, reading and replying e-mail, deleting a message.

**SHORTHAND-ENGLISH****Paper-II****Time : 2 hrs.****Theory****M. Marks : 30**

Revision of shorthand studied in 11th class.

**Part-I**

1. Prefixes and Suffixes.
2. Terminations and special contractions.
3. Shorthand Materials-pen, pencil and copy.
4. Dictation-method of taking dictation.
5. General mistakes and their rectification.

**Part-II**

6. Transcription.
7. Phraseography.
8. Evaluation of paper. Functions of a steno.
9. General knowledge of shorthand in other languages (Hindi/Punjabi).

**SHORTHAND-ENGLISH****Practical****Paper-II****Time : 3 hrs****M. Marks : 50**

1. Students are to pick up a speed of 80 W.P.M. A passage of 200 words in English will be dictated in 2.30 minutes.
2. After an interval of one minute, another passage of 200 words will be dictated in 2:30 minutes. Students will be required to transcribe both paras within 20 minutes on T/W.

3. Sessional work: A file of at least 100 pages will be prepared by students during the session.

## ਸ਼ਾਰਟਹੈਂਡ-ਪੰਜਾਬੀ

### ਪੇਪਰ-II

ਸਮਾਂ : 2 ਘੰਟੇ

ਲਿਖਤੀ

ਕੁੱਲ ਅੰਕ : 30

#### ਭਾਗ-I

ਗਿਆਰਵੀਂ ਸ਼੍ਰੇਣੀ ਵਿੱਚ ਸ਼ਾਰਟਹੈਂਡ ਦੀ ਸਿਖਲਾਈ ਲਈ ਪੜ੍ਹੇ ਨਿਯਮਾਂ ਦੀ ਦੁਹਰਾਈ।

1. ਅਗੇਤਰ-ਪਿਛੇਤਰ।
2. ਕਾਟਵੀਂ ਵਿੱਧੀ।
3. ਸ਼ਾਰਟਹੈਂਡ ਲਿਖਣ ਲਈ ਸਮੱਗਰੀ- ਪੈਨ, ਪੈਂਸਿਲ, ਕਾਪੀ।
4. ਡਿਕਟੇਸ਼ਨ ਲਿਖਣ ਦੀ ਵਿੱਧੀ।
5. ਆਮ ਗਲਤੀਆਂ ਦੀ ਸੁਧਾਰ ਵਿੱਧੀ।

#### ਭਾਗ-II

6. ਲਿੱਪੀ ਅੰਤਰ ਵਿੱਧੀ।
7. ਆਮ ਪ੍ਰਚੱਲਿਤ ਸ਼ਬਦਾਂ ਦੇ ਸੰਖੇਪ ਰੂਪ/ਵਾਕਾਂਸ਼।
8. ਪਰਚੇ ਦੀ ਮੁਲੰਕਣ ਵਿੱਧੀ, ਸਟੈਨੋ ਦੇ ਕਾਰਜ।
9. ਦੂਸਰੀਆਂ ਭਾਸ਼ਾਵਾਂ (ਅੰਗ੍ਰੇਜ਼ੀ/ਹਿੰਦੀ) ਦੀ ਸ਼ਾਰਟਹੈਂਡ ਸੰਬੰਧੀ ਆਮ ਵਾਕਫੀ।

## ਸ਼ਾਰਟਹੈਂਡ-ਪੰਜਾਬੀ

### ਪੇਪਰ-II

ਸਮਾਂ : 3 ਘੰਟੇ

ਪ੍ਰਯੋਗੀ ਪ੍ਰੀਖਿਆ

ਕੁੱਲ ਅੰਕ : 50

1. 200 ਸ਼ਬਦਾਂ ਦਾ ਪੈਰਾ 80 ਸ਼ਬਦ ਪ੍ਰਤੀ ਮਿੰਟ ਦੀ ਰਫਤਾਰ ਨਾਲ ਢਾਈ ਮਿੰਟਾਂ ਵਿੱਚ ਲਿਖਵਾਇਆ ਜਾਵੇਗਾ ਅਤੇ 20 ਮਿੰਟਾਂ ਵਿੱਚ ਟਾਈਪ ਮਸ਼ੀਨ ਤੇ ਲਿੱਪੀ-ਸ਼ੁੱਧ ਕਰਨ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।
2. 200 ਸ਼ਬਦਾਂ ਦਾ ਪੈਰਾ 80 ਸ਼ਬਦ ਪ੍ਰਤੀ ਮਿੰਟ ਦੀ ਰਫਤਾਰ ਨਾਲ ਲਿਖਵਾਇਆ ਜਾਵੇਗਾ ਅਤੇ 20 ਮਿੰਟਾਂ ਵਿੱਚ ਟਾਈਪ ਮਸ਼ੀਨ ਤੇ ਲਿੱਪੀ-ਸੋਧ ਕਰਨ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ।
3. ਸਿਖਲਾਈ ਦੌਰਾਨ ਵਿਦਿਆਰਥੀ ਵਲੋਂ ਸਾਲ ਦੌਰਾਨ ਕੀਤੇ ਕਾਰਜ ਦੀ ਘੱਟ ਤੋਂ ਘੱਟ 100 ਪੰਨਿਆਂ ਦੀ ਫਾਈਲ ਤਿਆਰ ਕੀਤੀ ਜਾਵੇ।

## ਸ਼ਾਟਹੈਂਡ (ਹਿੰਦੀ)

ਲਿਖਿਤ ਪਰੀਖਾ

ਪੇਪਰ - II

ਸਮਯ : 2 ਘੰਟੇ

ਅਧਿਕਤਮ ਅੰਕ : 30

(नोट : गियारवीं कक्षा में शार्टहैंड की सिखलाई के पढ़े हुए नियमों की दोहराई।)

### भाग – I

1. उपसर्ग – प्रत्यय।
2. काटवीं विधि।
3. शार्टहैंड लिखने के लिए सामान – पेन्, पेन्सिल, कापी।
4. श्रुतलेख लिखने की विधि।
5. गलतियाँ एवं उन्हें सुधारने की विधि।

### भाग – II

6. लिपि – अंतर विधि (Transcription)
7. आम प्रचलित शब्दों का संक्षेप रूप/वाक्यांश (Pharasecgraphy)
8. पर्चे का मुल्यांकन, स्टैनों के कार्य।
9. दूसरी भाषाओं (अंग्रेजी/पंजाबी) में शार्टहैंड सम्बन्धी जानकारी।

### शार्टहैंड (हिन्दी) प्रयोगिक परीक्षा

#### पेपर – II

समय : 3 घंटे

अधिकतम अंक : 50

1. 200 शब्दों का पैरा, 80 शब्द प्रति मिनट की गति से ढाई (2½) मिनट में लिखाया जाएगा और इसे 20 मिनटों में टाईप मशीन पर लिपि-शुद्ध करने को भी कहा जाएगा।
2. 200 शब्दों का एक और पैरा, 80 शब्द प्रति मिनट की गति से ढाई (2½) मिनट में लिखाया जाएगा और इसे 20 मिनटों में टाईप मशीन पर लिपि-शुद्ध करने को भी कहा जाएगा।  
(नोट : दिए गए दोनों पैरों में एक मिनट का विराम दिया जाएगा।)
3. सेशन के दौरान विद्यार्थियों द्वारा पूरे वर्ष में किये गए कार्य की कम से कम 100 पृष्ठों की फाईल तैयार की जाएगी।

## TYPEWRITING-ENGLISH

### Paper-III

Time : 2 hours

Theory  
Part-I

M. Marks : 30

1. Correspondence-Memorandum, D.O., U.O., Circular letter.
2. Typing systematically, Typing heading, Typing addresses on envelopes, Typing in margins, typing sub-headings.
3. Tabulation-Importance, methods.
4. Use and types of carbon paper, making duplicate copies, making corrections on carbon copies, care of carbon papers.

### Part-II

5. Stencil paper-Importance, use, method of cutting, methods of making corrections, use of fluid, stylus pen, stencil plate.

6. Duplicating machine, rotary duplicator.
7. Typing-legal and literary documents.
8. Evaluation methods of type paper, proof reading.

## TYPEWRITING-ENGLISH

### Practical

**Time : 3 hrs**

**M. Marks : 50**

1. Students are expected to pick up speed of 30 W.P.M. A para of 300 words will be given to be typed in 10 minutes (In English).
2. Typing an office letter on stencil paper within 20 minutes.
3. Typing 4-column statement in 30 minutes.
4. Sessional work. A file of at least 100 pages will be prepared by students during the session.

## ਟਾਇਪ ਰਾਇਟਿੰਗ-ਪੰਜਾਬੀ

**ਪੇਪਰ-III**

**ਸਮਾਂ : 2 ਘੰਟੇ**

**ਲਿਖਤੀ ਪ੍ਰੀਖਿਆ**

**ਕੁੱਲ ਅੰਕ : 30**

### ਭਾਗ-I

1. ਪੱਤਰ-ਵਿਹਾਰ-ਯਾਦ-ਪੱਤਰ, ਅਰਧ ਸਰਕਾਰੀ ਪੱਤਰ, ਗੈਰ ਸਰਕਾਰੀ ਪੱਤਰ ਆਦਿ ਜਾਣਕਾਰੀ।
2. ਸੁਚੱਜੇ ਢੰਗ ਨਾਲ ਟਾਈਪ ਕਰਨਾ-ਸਿਰਲੇਖ ਟਾਈਪ ਕਰਨਾ, ਲਿਫਾਫਿਆਂ ਤੇ ਸਿਰਨਾਵਾਂ ਟਾਈਪ ਕਰਨਾ।
3. ਸਾਰਨੀਕਰਨ-ਮਹੱਤਤਾ, ਵਿੱਧੀ।
4. ਕਾਰਬਨ ਪੇਪਰ ਦੀਆਂ ਕਿਸਮਾਂ, ਪ੍ਰਯੋਗ, ਨਕਲ ਤਿਆਰ ਕਰਨਾ, ਕਾਰਬਨ ਕਾਪੀਆਂ ਤੇ ਗਲਤੀਆਂ ਦੀ ਸੋਧ, ਕਾਰਬਨ ਪੇਪਰ ਦੀ ਸੰਭਾਲ।

### ਭਾਗ-II

5. ਸਟੈਂਸਲ ਪੇਪਰ-ਇਸ ਦੀ ਮਹੱਤਤਾ, ਪ੍ਰਯੋਗ, ਕੱਟਣ ਦੀ ਵਿੱਧੀ, ਅਸੁੱਧੀਆਂ ਸੁਧਾਰਨ ਦੇ ਤਰੀਕੇ, ਦਰੁਸਤੀ ਤਰਲ ਦਾ ਪ੍ਰਯੋਗ, ਸਟਾਈਲੈਸ ਪੈਨ ਅਤੇ ਸਟੈਂਸਲ ਪਲੇਟ ਦੀ ਵਰਤੋਂ
6. ਡੁਪਲੀਕੈਟਿੰਗ ਮਸ਼ੀਨ, ਰੋਟਰੀ ਡੁਪਲੀਕੇਟਰ।
7. ਸਾਹਿਤਕ ਤੇ ਕਾਨੂੰਨੀ ਖਰੜਿਆਂ ਨੂੰ ਸੁਚੱਜੇ ਢੰਗ ਨਾਲ ਟਾਈਪ ਕਰਨਾ।
8. ਟਾਈਪ ਪਰਚੇ ਦੀ ਮੁਲੰਕਣ ਵਿੱਧੀ, ਪ੍ਰਭੂ ਰਿਡਿੰਗ।

## ਟਾਇਪ ਰਾਇਟਿੰਗ-ਪੰਜਾਬੀ

### ਪ੍ਰੈਕਟੀਕਲ

**ਸਮਾਂ : 3 ਘੰਟੇ**

**ਵੱਧ ਤੋਂ ਵੱਧ ਅੰਕ : 50**

1. 300 ਸ਼ਬਦਾਂ ਦਾ ਪੈਰਾ 30 ਮਿੰਟਾਂ ਵਿੱਚ ਟਾਈਪ ਕਰਨ ਲਈ ਦਿੱਤਾ ਜਾਵੇਗਾ।

2. दफतरी पत्र का 20 मिनिट विच स्टैसल कटना।
3. 4 कालमों की स्टेटमेंट नुं 30 मिनिटों विच टापीप करना।
4. सिखलायी दोगान विदिआरधीआं वल्ले साल दोगान कीडे गडे कम की पॉटे-पॉटे 100 पंथिआं की हाथील तिआर कीडी जावे।

## टाईप – राइटिंग (हिन्दी)

लिखित परीक्षा

पेपर – III

समय : 2 घंटे

अधिकतम अंक : 30

### भाग – I

1. पत्राचार – मैमोरेण्डम, अर्ध – सरकारी पत्र (D.O. Letters), गस्ती पत्र (U.O.), गैर – सरकारी पत्र (Circular Letters) आदि के बारे में ज्ञान।
2. सही ढंग से टाईप करना – शीषक टाईप करना लिफाफों पर पता टाईप करना।
3. सारणीकरण – महत्व एवं विधि।
4. कार्बन पेपर की किस्में, प्रयोग, डुप्लीकेट कापी तैयार करना, कार्बन कापियों की शोध, कार्बन पेपर की संभाल।

### भाग – II

5. स्टैसल पेपर – इसका महत्व, प्रयोग, काटने की विधि, अशुद्धियाँ सुधारने के ढंग, कुरैकशन फ्लयूड (Correction Fluid) का प्रयोग, स्टायलस (Stylus) पेन्स, स्टैसल प्लेट का प्रयोग।
6. डुप्लीकेट मशीन, रोटरी डुप्लीकेटर।
7. साहित्यक एवं कानूनी दस्तावेजों को सही ढंग से टाईप करना।
8. टाईप पेपर की मुल्यांकन विधि, परूफ रीडिंग।

## टाईप – राइटिंग (हिन्दी)

प्रयोगी परीक्षा

समय : 3 घंटे

अधिकतम अंक : 50

1. 300 शब्दों का पैरा (Paragraph) 30 मिनिटों में टाईप करने के लिए दिया जाएगा।
2. दफतरी पत्र का 20 मिनिटों में स्टैसल काटना।
3. चार कालम की स्टेटमेंट को 30 मिनिटों में टाईप करना।
4. सेशन दौरान विद्यार्थियों द्वारा पूरे वर्ष में किये गए कार्य की कम से कम 100 पन्नों की फाईल तैयार की जाए।

## (ii) ACCOUNTANCY & AUDITING

Fundamentals of E-Business

Paper-I

Time : 2 hrs.

Theory  
Part-I

M. Marks : 30

**Unit-I Fundamentals of Information Technology**

- Concept and Scope of IT
- Elements of computer system : Computer hardware and software
- Computer Organization, CPU, memory, input devices, output devices, storage devices, communication devices, multimedia devices.
- Introduction to operating system.
- Introduction to the internet : Concept of internet, use of internet, requirement of internet, internet domain, internet server, establishing connectivity on the internet, types of internet providers, constitute of internet protocol, browsing the internet, tools and service of internet, procedure of opening e-mail account on internet.

**Part-II****CONCEPTUAL FRAMEWORK OF E-BUSINESS****Unit-2 Introduction to Electronic Commerce**

Meaning, features, functions and benefits of e-commerce, e-commerce practices vs. traditional practices, scope and basic models of e-commerce, limitations of e-commerce, precautions for secure e-commerce, proxy services, types of e-commerce, meaning of B2C, B2B, C2C, P2P,

**Unit-3E-Payment**

Transaction through internet, requirements of e-payments system, post paid payment system-credit card solutions, cyber cash, internet cheques, instant paid payment system debit card, pre-paid payment system-electronic cash, dig cash, net cash, cyber cash, smart cards.

**Unit-4E-Security**

Areas of internet security, security threats, security breach avoidance, deflection and recovery. Confidentiality and integrity, electronic signature, access control, authentication, precautions for secure e-commerce

**Unit-5E-Banking**

Meaning importance and types of e-banking services, traditional vs. e-banking, process of e-banking, advantages and disadvantages of e-banking, status of e-banking in India.

**Unit-6E-Marketing**

Concept of e-marketing, 4Ps of e-marketing, traditional marketing vs. e-marketing, advantages of e-marketing.

**FUNDAMENTALS OF E-BUSINESS****PRACTICAL**

**Time : 3 hrs****M. Marks : 50**

Internet and its applications

**PART-I**

1. Log into internet.
2. Navigation for seeking information.
3. Downloading information from internet.

**PART-II**

4. Sending and receiving e-mail.
  - (a) Create e-mail account
  - (b) Creating a message
  - (c) Creating an address book
  - (d) Attaching a file with e-mail
  - (e) Receiving a message
  - (f) Deleting a message
5. Purchasing through the net.

**PRINCIPLES OF MANAGEMENT AND ECONOMICS****Paper II****Time : 3 hrs****Theory  
Part A****M. Marks : 80****Marks : 40****Principle of Management**

- (i) Management; meaning; importance and principles of management.
- (ii) Planning : maning, features and types.
- (iii) Organization : meaning and importance.
- (iv) Staffing : (a) Recruitment meaning and sources ; (b) Selection : meaning and process; (c) Training : meaning and need.
- (v) Directing : meaning and importance.
- (vi) Controlling : meaning and importance; Steps in the process of control.

**Part B****Economics****Marks : 40**

- (i) Introduction : Micro Economics - Meaning and Scope, Macro Economics- Meaning and Scope, Difference between Micro and Macro Economics.
- (ii) Money : meaning and function of money.
- (iii) Banking : Central Bank and Types of Banks; Functions of commercial Banks.
- (iv) Public Finance : meaning of public finance, sources of govt, revenue, meaning of direct and indirect taxes and difference between indirect and direct taxes.

## **BOOK KEEPING AND ACCOUNTANCY**

**PAPER-III**

**Time : 3 hrs.**

**Theory**

**Max. Marks : 80**

### **PART-A**

#### **Unit I Accounting for Partnership.**

- ❖ Nature of Partnership : Partnership Deed (meaning, importance).
- ❖ Final Account of Partnership : Fixed v/s Fluctuating Capital. Division of Profit among partners (excluding guarantee and past adjustments), and Profit and Loss Appropriation Account.

#### **Unit II Reconstitution of Partnership.**

- ❖ Changes in Profit Sharing Ratio among the existing partners-Sacrificing Ratio and Gaining Ratio.
- ❖ Accounting for Revaluation of Assets and Liabilities and distribution of reserves and accumulated profits.
- ❖ Goodwill: Nature, Factors affecting and methods of valuation: Average profit, Super profit and Capitalization methods.
- ❖ Admission of a Partner; Effect of Admission of Partner, Change in Profit Sharing Ratio, Accounting Treatment for Goodwill (as per accounting standard 10), Revaluation of Assets and liabilities, Reserve (accumulated Profits) and Adjustment of Capitals.
- ❖ Retirement/Death of a Partner: Change in Profit Sharing ratio, accounting treatment of Goodwill, Revaluation of Assets and Liabilities, Adjustment of Accumulated Profits (Reserves), Payment to retiree/deceased partners.

#### **Unit III Dissolution of Partnership Firm.**

- ❖ Meaning, Settlement of Accounts : Preparation of Realization account and related accounts (excluding piecemeal distribution, sale to a company and insolvency of a partner)

### **PART-B**

#### **Unit IV Accounting Not-For-Profit Organisation.**

- ❖ Not for profit organization : Meaning and examples.
- ❖ Receipts and payments: Meaning and concept of fund based and non-fund based accounting.
- ❖ Preparation of Income and Expenditure Account and Balance Sheet from Receipts and payment Account with additional information.

#### **Unit V Accounting for Share and Debenture Capital**

- ❖ Share Capital : Meaning, Nature and Types
- ❖ Accounting for Share Capital : Issue and Allotment of Equity and Preference Shares; Over subscription and under subscription; Issue at par, premium and at discount; Calls in advance, Calls in arrears, Issue of Shares for consideration other than cash.
- ❖ Forfeiture of Shares : Accounting Treatment, Re-issue of Forfeited Shares.
- ❖ Presentation of Share and Debenture Capital in company's Balance Sheet.
- ❖ Issue of debenture : Meaning, issue at par premium and discount; issue of debenture for consideration other than cash.
- ❖ Redemption of debentures out of capital; redemption methods; lump sum payment, draw by lots, purchase in open market and conversion (excluding cum-interest and ex-interest).

#### **Unit VI Classification of Audit**

- ❖ Genral and Specific Audit; Commercial and Non-commercial Audit.
- ❖ Private Audit : (Accounts of Sale-Trades, Partnership Firm, Individual) and Govt. Audit.
- ❖ Independent Audit (External and Internal).
- ❖ Statutory and Non-Statutory Audit, Continuous and periodical Audit. Completed/Annual Audit.

### **III HOME SCIENCE GROUP**

#### **(i) FOOD PRESERVATION FOOD PROCESSING**

**Paper-I**

**Time : 2 hrs.**

**THEORY**

**M.Marks : 30**

1. Food Processing - Definition of terms, unit operation, types of unit operation, small & large scale processing.
2. Processing by heat- Pasteurization and sterilization, processing of vegetable and fruit by heat.
3. Canning-General outlines of canning unit operations, i.e. receiving, selecting, weighing, sorting, preparing, blanching, filling, exhausting, seaming, sterilizing, cooling, packing, labeling, warehousing & dispatching.
4. Processing and canning of various seasonal fruits such as apples, pears, mangoes, papaya and vegetables like beans, tomatoes, carrots, potatoes, and peas.
5. Spoilage of canned fruits and vegetables, causes and their control.
6. By-products-utilization of fruit and vegetable waste like lemon, orange, guava, mangoes, banana, grapes, tomatoes, peas and spinach.

#### **FOOD PROCESSING**

**PRACTICAL**

**Time : 3 hrs**

**M. Marks : 50**

1. Washing, Sterilizing, disinfecting bottles and cans.
2. Pasteurization and sterilization of fruit and vegetable juices in bottles.
3. Visit to Canning/Bottling unit to observe application of seam checking gauge, micrometer, pressure gauge, vacuum gauge, cut out analysis of can etc.
4. Canning of mango, pineapple, citrus fruits, papaya, peas, tomato & spinach/saag.
5. Utilization of by products in preparation of lemon peel pickle, orange peel marmalade and citrus peel candy.

All practicals to be recorded in file along with procedures, analysis and samples.

## **PLANT MANAGEMENT**

### **THEORY**

#### **Paper-II**

**Time : 2 hrs.**

**M. Marks : 30**

1. Selection of site, factory layout plan, water supply, drainage, labour, equipments forward and backward linkage.
2. Water types, significance of chemical and bacteriological qualities and management of water. Impact of hard water on equipment, food and containers, chlorination of water and its importance in food processing.
3. Detergents and cleaning agents-types and selection of clearing agents for food industry.
4. Hygiene and sanitation-Hygienic standards for plant and staff, disinfection in a food processing unit an Waste disposal of plant.
5. Control of pests and rodents in a food factory.
6. Study of equipments & their maintenance.
7. Book keeping, balance sheet and profit-loos analysis.
8. Project report writing.

## **PLANT MANAGEMENT**

### **PRACTICAL**

**Time : 3 hrs.**

**M. Marks : 50**

1. Visit to food factories and report writing on plant lay-out.
2. A project report on setting up of a food factory.
3. A report on sanitary standards of a food factory.
4. Planning lay out of factory, making charts for lay-out for a cannery.
5. Determination of hardness of water.
6. Practical training to carryout measures for pest control.
7. Cleaning and maintenance of equipments.
8. Procedure and filling-up of required documents i.e. loan forms, licenses, electric connections, FPO returns, sales tax returns etc.

All practicals to be recorded in file along with procedures, analysis and samples.

## **FOOD PACKAGING**

### **THEORY**

#### **Paper-III**

**Time : 2 hrs.**

**M. Marks : 30**

1. Need and functions of packaging. Modes and economics in packaging of foods.
2. Types of traditional and modern packaging materials such as O.T.S. cans, bottles, P.V.C. L.D.P.E., H.D.P.E., laminators, retort pouch, PET Bottles, Tetra packs and permeability for oxygen and moisture.
3. Paper packing-paper as a container butter paper, wax paper, cellophane paper.
4. Skin packs, blister packs-their utility in food packing, importance and selection.
5. Crushing material for packing food, wood shearing, paper shearing, aerosils, thermocols and others.
6. Corrugated boards-importance, criteria for selection.
7. Wooden containers, their replacements with changing situations.
8. Use of strips, seals and similar material (veils) for sealing boxes for local and export markets.

## **FOOD PACKAGING**

### **PRACTICAL**

#### **Paper-III**

**Time : 3 hrs.**

**M. Marks : 50**

1. Observing the packing of foods in food industry.
2. Market survey for availability of packing materials.
3. Preparation of a scrap book with samples of different packing materials.
4. Suitability of butter paper, wax paper, cellophane and other papers.
5. Measurements of closure caps, wad and their identifications.
6. Exhibition of food products at production centers.

All practicals to be recorded in file along with procedures, analysis and samples.

## **(ii) COMMERCIAL GARMENT DESIGNING AND MAKING**

### **DRESS MAKING**

#### **Paper-I**

**Time : 2 hrs.**

**M. Marks : 30**

#### **1. Fashion**

- a) Origin-costumes from medieval to modern period (Sultanate period, Mughal period, Pre-British & British period).

- b) Fashion-Definition and related terminology-style, hi-style, classic, fads, chic etc.
  - c) Factors favouring and retarding fashion.
  - d) Fashion cycle.
  - e) Role of fashion and fashion designer in the garment industry.
2. Silhouette-Types knowledge of current silhouettes.
  3. Special dress designs for children and adults with special emphasis on (a) sleeves and cuffs (b) collars (c) pockets (d) yokes.
  4. Fitting-Method of taking trial, finding out the defects in fitting and suggesting remedies for the defects.
  5. Study of traditional embroideries-Phulkari, Kashida, Chicken-kari, Kantha and Dasuti.

### **DRESS MAKING PRACTICAL**

**Time : 3 hrs.**

**M. Marks : 50**

1. Designing, drafting, layout, cutting, stitching and finishing of the following garments:
 

(a) Bush Shirt	(d) Shirt
(b) Kurta	(e) Shirt top
(c) Pyjama	(f) Nighty
2. Fitting - Fitting trials, finding defects and rectifying the same.
3. Ironing folding and packing of finished garments.
4. Using innovative traditional embroidery stitches and techniques on the garments designed and stitched.

Design file - Stepwise illustration exploring the design plan, drafting, layout, paper patterns and other embellishments.

Embroidery file showing samples of different embroideries and other embellishments prevalent.

All practicals to be recorded in file along with procedures, analysis and samples.

### **COMMERCIAL CLOTHING**

**Paper-II**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

1. Calculation of standard body measurements from chest/bust and height measurement.
2. Grading its importance and method.
3. Knowledge and use of special equipments for button hole making, buttoning, overlocking, embroidery, picoh, eyelet, embroidery stitches and button covering.
4. Estimation of (a) fabric (b) length of lay (c) raw material and asessories according to design, sizes, order size and other criteria.
5. Study of processes and stages of commercial(bulk) production (laying, marking, cutting, ticketing, assembling and distribution of components, stitching, assembling of garments, finishing of raw edges, checking, laundering, ironing, folding and packing).
6. Finishing and quality control (checking at various stages).
7. Sale promotion techniques like exhibitions, displays (window and interior), advertisements, fashion shows, discount sales, sample portfolio.
8. Readymade garments-their importance, selection and evaluation for (a) Appearance (b) Workmanship (c) Fabric (d) Cost.

## **COMMERCIAL CLOTHING**

### **PRACTICAL**

#### **Paper-II**

**Time : 3 hrs.**

**M. Marks : 50**

1. Drafting of Men's shirt & Trouser.
2. Drafting of Formal ladies suit.
3. Drafting of Formal Baby Frock.
4. Designing of Home textiles products-Quilt cover, Pillow cover, cushion cover, Bag, Tray mat, Dinning tale mat, Table Runner etc.
5. Adjustment of pattern according to various body shapes e.g. full bust, flat bust, steeping shoulders etc.
6. Computerised/manual grading of pattern one size up and one size below (for children, women and men).
7. Costing of the finished garment.
8. Taking orders from the market for two garments each for men, women or children, and one from home textile products.

9. Exercises in estimation of (a) fabric (b) length of lay (c) raw material and accessories according to design, size, order size and other criteria.
  10. Planning & organization of exhibitions, display, fashion shows, etc.
  11. Visit to commercial Unit to observe stages of commercial production of garments.
- All practicals to be recorded in file along with procedures, analysis and samples.

## **UNIT MANAGEMENT**

### **THEORY**

**Paper-III**

**Time : 2 hrs.**

**M. Marks : 30**

1. Unit establishment selection of site for factory building/shop personnel requirement, equipment requirements, raw materials procurement and complete budgetary requirements.
2. Lay-out plans for efficient and smooth working of units.
  - (a) Effective and maximum utilization of space available.
  - (b) Emphasis on safety measures.
  - (c) Care and maintenance of equipment and machines.
  - (d) Effective storage of raw material.
  - (e) Knowledge regarding the working of a garment manufacturer/export industry and the job responsibility of the persons employed at different levels.
  - (f) Knowledge and management of records prevalent in the garment industry.

## **UNIT MANAGEMENT**

**Paper-III**

### **PRACTICAL**

**Time : 3 hrs.**

**M. Marks : 50**

Making a file with the following information.

1. Lay-out plans for factory/shops etc.
2. Lay-out plans for interior for the same.
3. Using various cleaning agents and techniques for maintenance of various types of equipments in the unit.
4. Visit to different related industries and reporting regarding lay-out, equipments, safety, storage and personnel etc.

All practicals to be recorded in file along with procedures, analysis and samples.

### **(iii) TEXTILE DESIGNING TEXTILE TESTING AND FINISHING**

**Paper-I****Time : 2 hrs.****THEORY****M. Marks : 30**

1. Study of hard and soft water methods of removing of hardness of water.
2. Study of various kinds of advanced finishing processes used in textiles - Shearing, Raising, Sinzeing, Decatizing, Sanforization. Mercerisation, Sizing, Starching, Crease, Resistance, Calendaring, Anti-static Water Resist and Water proof finish. Fire Resist and Fire proof finish. Mildew proofing and Moth proofing their importance and uses.
3. Indtroduction to dry and wet cleaning their importance and uses.
4. Detailed study of various types of machines used for dry cleaning and washing of different textiles.
5. Dry cleaning of different textiles.
6. Cleaning of carpets, galicha, sofa sets and wall hangings.
7. Folding and packing of the finished articles.

**TEXTILE TESTING AND FINISHING****PRACTICAL****Paper-I****Time : 3 hrs.****M. Marks : 50**

1. Detailed study of textiles fibres (by Physical and Chemicals Methods) to identify the dye applicable to the given fibre.
2. Qualitative and quantitative analysis of different blends-terry-cot, terry-wool, terry-viscose, cots-wool, cotton-cashmilon.
3. Practice of dry cleaning woolen garments.
4. Practice of wet cleaning.
5. Practice of testing shrinkage of cotton.
6. Colour fastness testing with grey scale.

All practicals to be recorded in file along with procedures, analysis and samples.

**TEXTILE DESIGNING AND PRINTING****THEORY****Paper-II****Time : 2 hrs.****M. Marks : 30**

1. Classification of Printing styles - Direct, Discharge and Resist styles.  
Direct Style-Block and Screen Printing.

Discharge Style-Oxidation and Reduction Printing

Resist Style-Batik, Tie & Dye and Chemical dsResist Printing.

2. Printing of cotton fabric using Direct Dyes, Rapid Fast Dyes, Reactive Dyes, Azoic and Indigo-sol Dyes with Direct Style.
3. Printing of synthetic and blended fabrics with Pigment Colours, Disperse and Reactive dyes.
4. Different types of printing machinery-Flat Bed, Rotary and Roller Printing Machine-their operations, techniques, advantages and disadvantages.
5. Making of screens by direct and photographic method and printing with screen on various textiles.
6. After treatment given to printed textile-Drying, steaming, ageing & washing.
7. Introduction to computer aided designing.

## **TEXTILE DESIGNING AND PRINTING**

### **PRACTICAL**

#### **Paper-II**

**Time : 3 hrs.**

**M. Marks : 50**

- 1) Practice of printing cotton fabric with Batik style and Chemicals Resists Printing.
- 2) Practice of printing cotton fabric with various Tie and Dye Techniques.
- 3) Practice of printing cotton fabric with Direct, Rapid Fast, Indigosol and Reactive Dyes with Block, Screen and Spray Printing methods.
- 4) Practice of Screen Making.
- 5) Practice of printing a blended fabric-blended, terry-cot, cots-wool, with pigment colours with screen printing using different colours.
- 6) One article each to be worked out with a combination of two or more techniques e.g. Tie and Dye & Block-printing; Batik and fabric printing; Spray and Screen Printing.
- 7) Introduction to computer aided designing.

All practicals to be recorded in file along with procedures, analysis and samples.

## **TEXTILE DYEING**

### **THEORY**

#### **Paper-III**

**Time : 2 hrs.**

**M. Marks : 30**

- 1) Scouring and bleaching of viscose, acetate rayon, nylon, terylene and acrylic (cashmilon).
- 2) Dyeing of polyester with disperse dyes using conventional carrier and high temperature/High pressure method.
- 3) Properties and applications of basic dyes on cashmilon.
- 4) Dyeing of nylon with acid dyes and direct dyes.
- 5) Application of direct dyes on viscose.
- 6) Study of machinery used in textile dyeing-Winch machine, Jigger machine, Beam dyeing machine, Jet dyeing machine, Soft flow machines, cone dyeing machine and Cabinet dyeing machine.

### **TEXTILE DYEING PRACTICAL**

**Paper-I**

**Time : 3 hrs.**

**M. Marks : 50**

- 1) Practice of scouring and bleaching of Acrylic, viscose and terrycot.
- 2) Practice of dyeing of polyester with Disperse dyes using carrier method.
- 3) Practice of dyeing cashmilon with Basic dyes.
- 4) Practice of dyeing nylon with Acid and Direct dyes.
- 5) Practice of dyeing Terry-cot.
- 6) Practice of matching shades with direct dyes.

All practicals to be recorded in file along with procedures, analysis and samples.

### **(iv) TEXTILE CRAFT (WEAVING) FABRIC STRUCTURE AND DESIGNING THEORY**

**Paper-I**

**Time : 2 hrs.**

**M. Marks : 30**

- 1) An introduction to compound and complex weaves-Broken twill, Mixed twill, Transposed twill, Fancy twill, Satin and Sateen, Mockleno, Bedford-cord, Corduroy and Huck-a-back, Swivel, Double, cloths.
- 2) Weaving defects and their remedies.
- 3) Cloth analysis-Recognition of warp and weft, Picks/inch, ends/inc. Pattern of colour scheme, weight of warp, weight of weft and quality of cloth.
- 4) Introduction to Computer Aided Designing.
- 5) Colour-Theory of colour, Qualities of colours, Colour wheel, Colour schemes, Psychological impact of colours and factors affecting choice of colours.

## **FABRIC STRUCTURE AND DESIGNING**

### **PRACTICAL**

#### **Paper-I**

**Time : 3 hrs.**

**M. Marks : 50**

- 1) Preparation of warp, drafting, denting and drawing for plain, twill, mockleno, Bedford-cord and huck-a-back weaves on the powerloom.
- 2) Analysis of cotton, silk and worsted cloth samples with different weaves and patterns.
- 3) Removal of cloth defects on the loom.
- 4) Introduction to computer aided designing.
- 5) Colour-Wheel, tins and tones, combinations and schemes.
- 6) Sketching of floral and geometrical motifs.

All practicals to be recorded in file along with procedures, analysis and samples. Visit to Museums, Art galleries, Craft Meals and report writing of the craft appraised.

## **TEXTILE TESTING AND DYEING**

### **THEORY**

#### **Paper-II**

**Time : 2 hrs.**

**M. Marks : 30**

- 1) Physical testing for Count of yarn, twist of yarn, yarn ply, types of yarn, tensile strength of yarn, shrinkage of cloth, crease resistance, strength of cloth and abrasion test.
- 2) Chemical testing for damage to cellulose and animal fibres, colour fastness to washing, Sunlight, rubbing, bleaching and Crocking.
- 3) Quantitative and qualitative analysis of blends - Terricot, terrywool, viscot and cotswool.
- 4) Preparation of material before dyeing i.e. scouring, boiling, washing, bleaching.
- 5) Dyeing process on cotton, wool, silk and synthetic (Polyster) fibres using Direct dyes, Acid dyes, Basic dyes, Reactive dyes, Vat dyes, Indigosol dyes, Mordant dyes, Azoic dyes and Disperse dyes according to their dyeing suitabilities.
- 6) Dyeing of silk and wool by Chrome and Procion dyes. Dyeing of polyester by disperse dyes.

## **TEXTILE TESTING AND DYEING**

### **PRACTICAL**

**Time : 3 hrs.**

**M. Marks : 50**

- 1) To find the yarn count of given piece of cloth by Besseley balance and by physical balance.

- 2) To find the crease resistance angle of a given sample
  - 3) To find the shrinkage percentage of a given sample
  - 4) To find percentage of different fibres from a given sample
  - 5) Preliminary treatment to cotton & woollen cloth or yarn before dyeing.
  - 6) Practice of sample dyeing on cotton yarn/fabric with direct, vat, Azoic and reactive dyes.
  - 7) Practice of sample dyeing on woollen yarns/Fabric with acid and reactive dyes.
  - 8) Practice of sample dyeing on silk and wool with chrome and Procion dyes.
  - 9) Practice of sample dyeing on polyester with disperse dyes
- All practicals to be recorded in file along with procedures, analysis and samples.

## **POWERLOOM MECHANICS & OPERATIONS THEORY**

**Paper-III**  
**Time : 2 hrs.**

**M. Marks : 30**

- 1) Types of powerlooms-Air jet, water jet, Dornier, Automatic, Shuttleless and Computerized looms.
- 2) Parts of power loom and their functioning.
- 3) a) Introduction to different types of dobbies - Knowles' positive doobby, Negative doobby, Single chain, Double chain and Hetter sley.  
b) Introduction to different types of Jacquards-Single Cylinder, Single Lift Jacquard, Double Cylinder, Double lift Jacquard.
- 4) Different motions of the powerlooms
  - a) Primary - shedding, pickling & beating up.
  - b) Secondary - taking up and letting off
  - c) Auxillary - warp stop motion, weft fork motion, loose reed motion, fast reed motion.
- 5) Checking of powerlooms before operation and general precautions.
- 6) Maintenance of powerlooms.
- 7) Making of lattice and pegging according to the design of the cloth to be woven on a doobby powerloom.
- 8) a) Sketching of design on graph paper, card punching and lacing to make a chain for the jacquard.  
b) Introduction to Piano Cards Cutting Machine.

**POWERLOOM MECHANICS & OPERATIONS  
PRACTICAL**

**Paper-III****Time : 3 hrs.****M. Marks : 50**

- 1) Identification of different parts of powerloom.
- 2) To prepare lattice as per given design or sample.
- 3) To prepare chain for the jacquard as per given design.
- 4) Practice of weaving of cloth on plain, dobby and jacquard loom.

All practicals to be recorded in file along with procedures, analysis and samples. Visit to reputed power loom industry, on the job experience and report writing for the same.

**(v) KNITTING TECHNOLOGY**

**TEXTILE CALCULATIONS AND GARMENT MAKING  
THEORY**

**Paper-I****Time : 2 hrs.****M. Marks : 30**

- 1) Definition of count.
- 2) Method of finding count in Indirect System.
- 3) Method of finding weight in Indirect System.
- 4) Method of finding length in Indirect System.
- 5) Method of finding the count in Direct System.
- 6) Method of finding length in Direct System.
- 7) Method of finding weight in Direct System.
- 8) Conversion from
  - (i) Indirect to Direct system.
  - (ii) Direct to Indirect system.
- 9) Brief explanation of machines used for sewing knitted garments. (Over lock, Flat lock, Sewing machine etc.)
- 10) Different types of garments made from knitted fabrics.
- 11) Different sizes charts of Garments.

**TEXTILE CALCULATIONS AND GARMENT MAKING  
PRACTICAL**

**Paper-I****Time : 3 hrs.****M. Marks : 50**

- 1) Adjustment of the knives of the over lock machine.
  - 2) Identification & functioning of different parts of over lock machine.
  - 3) Adjustment of the needle of over lock machine.
  - 4) Adjustment of the loops of the over lock machine.
  - 5) Method of calculation cost per piece in knitting industry.
  - 6) Drafting of Pull-over, Slipover, Cardigan and undergarments (Vests and Under-wears).
  - 7) Cutting and making of V-neck slip-over.
  - 8) Cutting and making of pull-over.
  - 9) Cutting and making of half-sleeve vest.
  - 10) Board pressing of knitted garments.
  - 11) Mending, pressing, labeling, folding and packing of finished product.
- All practicals are to be included in file along with procedures.

### **CIRCULAR KNITTING THEORY**

**Paper-II****Time : 2 hrs.****M. Marks : 30**

- 1) Different types of welts.
- 2) Effects of good winding in knitting.
- 3) Different types of knots used in Knitting Industry.
- 4) Different types of sinkers and their different parts with diagram.
- 5) Knitting movements of Latch Needle with holding down sinker.
- 6) Knitting movements of Latch Neele with Loop forming sinker.
- 7) Cam set of simple circular Knitting Machine.
- 8) Explain Jacquard in knitting.
- 9) Explanation Pattern Wheel Mechanism with diagram.

### **CIRCULAR KNITTING PRACTICAL**

**Paper-II****Time : 3 hrs.****M. Marks : 50**

- (1) Identification of cams from a cam-system of a circular knitting machine.

- (2) Formation of welt on a circular knitting machine.
- (3) Disassembling & assembling of cam set/system.
- (4) Jobbing-on & Running on operations.
- (5) Setting of stitch-length for stitch/loop setting.
- (6) Transferring of loop stitch from one needle to another needle.
- (7) Adjustment of center and timing of dial and cylinder.
- (8) Threading of yarn from bobbin stand/creel to yarn feeder and guide.
- (9) Calculation of the designing area of two/four pattern wheel circular machine.
- (10) Drafting of design on graph paper.
- (11) Filling of Bits in pattern wheels according to design.
- (12) Setting of pattern wheels with cylinder and knitting a designed fabric.

All practicals are to be recorded in file along with procedures.

## **FASHIONED KNITWEAR THEORY**

### **Paper-III**

**Time : 2 hrs.**

**M. Marks : 30**

1. Identification and functions of different parts of hand flat jacquard knitting machine.
2. Explaining starting sequence of hand flat jacquard knitting machine.
3. Producing a plain knitted fabric on hand flat jacquard knitting machine.
4. Producing a 1×1 & 2×2 rib on hand flat jacquard knitting machine.
5. Explaining with diagram the loop-formation of Latch-Needle on hand flat jacquard knitting machine.
6. Explaining with diagram the tuck formation of Latch-Needle on hand flat jacquard knitting machine.
7. Explaining with diagram the cam set of Hand Flat Jacquard Knitting Machine.
8. Types of knitted fabric produced on a Hand Flat Jacquard Knitting Machine.
  - (i) Knitting of fashion garments
  - (ii) Narrowing
  - (iii) Widening
9. Basic knowledge regarding electronic machines.

## **FASHIONED KNITWEAR**

**PRACTICAL****Paper-III****Time : 3 hrs.****M. Marks : 50**

1. Identification & functions of different parts of Hand Flat Jacquard Knitting Machine.
2. Disassembling and assembling of the parts of Hand Flat Jacquard Knitting Machine.
3. Jobbing-on operation, Running-on operation and winding off operation.
4. Starting sequence of the machine.
5. Plain Knitting 1x 1 rib and 2 x 2 rib on hand flat machine.
6. Adjustment of Stitch-cam for stitch setting.
7. Adjustment of Brushes & Yarn Guides.
8. Producing (i) Deeca-Design (ii) Rack-Design. (iii) Jacquard-Design, (iv) Tuck-Design.
9. Knitting-(i) Half cardigan (ribs) (ii) Full cardigan (ribs).
10. Knitting-(i) Pull-over (ii) Slip-over.

All practicals to be recorded in file along with procedures, analysis and samples.

**IV ENGINEERING & TECHNOLOGY GROUP****(i) MAINTENANCE AND REPAIR OF ELECTRICAL DOMESTIC APPLIANCES****Paper I. ELEMENTS OF ELECTRICAL TECHNOLOGY****Time : 2 hrs.****THEORY****M. Marks : 30**

1. D.C. Motors; Types of motors - series, shunt and compound. Constructions, working principles and applications of different types of motors (fractional horse power). Starting and starters for D.C. Motors, Speed Control and Speed revers method of D.C. Motor, Common faults, their causes, testing and repair (no derivation).
2. Diodes : Types of Diodes, working principles and characteristics of Diodes, specifications and ratings, Diode as rectifier.
3. Transformer : Types of Transformer-step up and step down transformer, voltage and current transformer, autotransformer: Constructions, working principles, rating and applications of different types of transformer. Rewinding of transformers. Introduction to a welding transformer. Study of star connection and delta connection simple derivation related to above contents.
4. Single phase A.C. Motor : Types of A.C. Motors-Induction Motor (Split phase and repulsion start), Capacitor Motor, Shaded Pole Motor, Universal Motor, Constructions, working principles, special characteristics, and applications of different types of fractional horse power motors. Starting and starters for different motors. Rotation, reversal and speed control of A.C. Motors. Installation of A.C. Motors and testing. Common faults-their causes, testing and repairs.

**ELEMENTS OF ELECTRICAL TECHNOLOGY****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

1. To test and repair a defective cycle dynamo.
2. Measurement of resistance of series, shunt field and armature and identification of terminals by multimeter.
3. Measurement of insulation resistance of armature and field.
4. Testing, fault finding and repair of a D.C. motor.
5. Overhauling of a D.C. motor.
6. Dismantling, study and reassembling of a D.C. motor starters.
7. To study D.C. series motor, its running, speed control, reversing rotation, measurement of current, voltage and speed.
8. To study D.C. shunt motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
9. To study D.C. compound motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
10. To study D.C. universal motor, its running, speed control, and reversing rotation, measurement of current, voltage and speed.
11. Identification of semi conductor diodes.
12. Characteristics of diode.
13. Study of a half-wave rectifier circuit with and without filter. Using CRO
14. Study of a full-wave rectifier circuit with centre tap transformer with and without filter. Using CRO
15. Study of a bridge rectifier circuit with and without filter. Using CRO
16. Study of (i) Voltage transformer (ii) Current transformer and (iii) Auto-transformer.
17. Dismantling, study and reassembling of an A.C. motor.
18. Overhauling of an A.C. Motor.
19. Dismantling, study and reassembling of an A.C. motor starters.
20. Testing, fault finding and repair of an A.C. motor starters.
21. Connecting, starting, running and reversing of an induction motor.
22. Connecting, starting, running and reversing of an capacitor motor.
23. Connecting, starting, running and reversing of a shaded pole motor.
24. Connecting, starting, running and reversing of an A.C. universal motor.
25. Installation of three phase A.C. motor.

**Paper-II****ELECTRICAL DOMESTIC APPLIANCES****Time : 2 hrs.****THEORY****M. Marks : 30****1. Electric Room Heater :**

Construction and working principle of Blower type room heater, common defects, their causes, testing and repair.

**2. Electric Fans :**

Types of fans - Ceiling fan, Pedestal fan, Fresh-air fan, Table fan, Bracket fan, Exhaust fan, Constructions, working principles, special characteristics and applications of electric fans. Common faults, their causes, testing and repairs; Installation of Bracket fan and Exhaust fan.

**3. Electric Mixer :**

Constructions, working principles, special characteristics and applications of Electric Mixer, Common faults, their causes, testing and repairs, Repair, servicing, maintenance and overhauling of Electric Mixer.

**4. Electric Washing Machines :**

Constructions, working principles, special features and applications of different types of washing machines. Common faults, their causes, testing and repairs. Repair, servicing, maintenance and overhauling of washing machines.

**5. Hair Dryer :**

Construction and working principles of Hair Dryer, Common faults their causes, testing and repair.

**6. Room Cooler :**

Construction and working details of Room Cooler, Common faults their causes, testing and repair. Installation of Room Cooler.

**7. Vacuum Cleaner :**

Construction and working principles of Vacuum Cleaner, Common faults, causes, testing and repair.

**8. A.C. Voltage Stabilizer (manual):**

Construction, working principles of Stabilizer, Common faults, causes, testing and repair.

**9. Electric Hand Drill :**

Construction and working principles of electric Hand Drill, Common faults, causes, testing and repair.

**10. Battery Charger.**

Construction, working, common faults, causes, testing and repair, specifications of a battery charger.

## **DOMESTIC APPLIANCES**

### **Paper-II**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Testing, fault finding, repair and overhauling Blower type, Room Heater and its maintenance.
2. Testing, fault finding, repair and overhauling Electric Fans.
3. Testing, fault finding, repair and overhauling Electric Mixer.
4. Testing, fault finding, repair and overhauling Washing Machine.
5. Testing, fault finding, repair and overhauling Hair Dryer.
6. Testing, fault finding, repair and overhauling Room Cooler.
7. Testing, fault finding, repair and overhauling Vacuum Cleaner.
8. Testing, fault finding, repair and overhauling Voltage Stabilizer. (Manual)
9. Testing, fault finding, repair and overhauling Electric Hand Drill.

### **Paper-III**

## **MATERIALS & WORKSHOP PRACTICE**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

#### **1. Assembly shop :**

Tools, machines, equipment and instruments required for assembly shop-their working and use. Planning layout and setting of an assembly shop. Rules and methods of sequential assembly of appliances. Safety precautions and measures in assembly shop. Up keeping of assembly shop.

#### **2. Testing Laboratory :**

Tools and instruments required for testing laboratory-their working and use. Planning, layout and setting of a testing laboratory. Methods of testing continuity, open circuit, short circuit, earth fault in open winding and closed winding. Methods of measuring resistance, insulation resistance, voltage, current, power consumption, temperature and speed. Safety precautions and measures in testing laboratory. Upkeeping of testing laboratory.

#### **3. Repair-Shop :**

Tools, machines, equipment and instruments required for repair-shop - their working and use. Planning, layout and setting of repair-shop. Rules and methods of repair, servicing and overhauling domestic appliances. Safety precautions and measures in repair-shop. Unkeeping of repair shop.

#### **4. Winding Shop :**

Tools, machines, equipment and instruments required for winding shop, their working and use. Planning, layout and setting of a winding shop. Rules and methods of winding of armature, stator, rotor and fields coils. Safety precautions and measures in winding shop. Upkeeping of winding shop.

**5. Estimating, Costing and Billing :**

Elements of estimation ; Quantity and specifications of required materials, knowledge of waste and extra material requirement, proforma for estimation. Elements of costing. Market value of materials, labour cost, production cost, overhead cost, profit and total cost. Method of costing, costing proforma. Billing methods and terms of payments.

**6. Load, estimation and test report :**

Specifications of various electrical accessories and appliances. Load calculations of an electrical installation and preparation of test report as per norms. Estimation of a bimonthly electricity bill.

**MATERIALS & WORKSHOP PRACTICE**

**Paper-III**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Drawing layout of (i) Assembly shop (ii) Testing Laboratory (iii) Repair shop and (iv) Winding shop.
2. Drawing (i) lap-winding and (ii) Wave winding for armature-winding.
3. Formation of field coil winding.
4. Formation of stator coil winding.
5. Practice for making a card-board bobbin/former.
6. Practice for assembly of domestic appliances.
7. Rotor winding of motor used in electric mixer.
8. Drawing stator winding of A.C. motor. (Single & three phase motor).
9. Estimating repair, service and overhauling of domestic appliances, its costing and billing.
10. Study of a given project report.
11. Preparation of a test report.
12. Study of an electricity bill issued by electricity deptt.
13. Estimating electricity bill of a given electrical installation.

**(ii) REPAIR AND MAINTENANCE OF RADIO & TELEVISION**

**Paper-I**

**T.V. TRANSMISSION AND RECEPTION**

**Time : 2 hrs.****THEORY****M. Marks : 30****1. TV Transmission and Pulse circuits.**

- \* Camera scanning standards and synchronization. Composite video signals.
- \* Transmitters : Principle, Characteristic, block diagram (sound and picture), Channel band width, Principle of amplitude and frequency modulation, advantages and disadvantages.
- \* Pulse circuits- multivibrators, blocking oscillators, differentiating and integrating circuits.

**2. TV Reception**

- \* Block diagram of Monochrome TV Receiver, working Principles of different sections like Tuner, video section, sound section, Sync Section, Deflection circuits, AGC, AFC, EHT and Picture Tube. Power supply and their types like SCR and SMPS.
- \* Block diagram of colour TV Like PAL/SECAM/NTSC system. Coloured picture tubes and their types.

**3. TV Antenna**

- \* Principle, folded dipole, director and reflector, feeder cables, balun, booster amplifier, Installation and testing UHF and VHF converters.
4. Comparison of a TV Receiver with Visual Display unit.

**T.V. TRANSMISSION AND RECEPTION****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

1. Study and demonstration of integrator and differentiator circuits on CRO.
2. Study and demonstration of limiter circuit on CRO.
3. Study, demonstration and use of multivibrators on a CRO.
4. Study, use and demonstration of a saw tooth generator on a CRO.
5. Checking of SCR Power supply.
6. Checking of SMPS Power supply.
7. Study of T.V. Receiver-Monochrome and colour.
- 8.(a) Familiarization of consumer and technician controls with safety precautions.
  - (b) Identification of different sections and components there in.
  - (c) Tracing of various stages.
  - (d) Demonstration of circuit diagrams in stages.
  - (e) Voltage measurement in various stages.
  - (f) Study of input and output wave forms of various stages on a CRO.

- (g) EHT voltage testing.
- (h) Alignment of RF, IF and SIF sections.

**Paper-II TEST & MEASURING INSTRUMENTS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

**1. Test Signal Generators :**

Specifications, Operator Controls, use and applications of the following instruments :

- Tone generator
- AM and FM, RF signal generator
- Colour bar Generator.
- Pattern Generator.
- Signal injectors, sweep generators, Wobbuloscopes

**2. Test and Alignment :**

Power supply adjustments, channel selection and tuning. Adjustment for geometric distortion like centering, height, width, linearity, pincushion, convergence etc. Alignment of video IF, Tuner, AGC and AFC. Adjustments, colour sensitivity. Deflection circuits, focus adjustments. Delay line adjustments for colour. Other adjustments as necessary.

**3. FM Receiver Section :**

Various alignment and adjustment of sound IF section.

**TEST AND MEASUREING INSTRUMENTS**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Demonstration of composit video-signal on a CRO.
2. Demonstration and use of Monochrome/colour pattern generator.
3. Familiarization and use of Sweep generator.
4. Demonstration of sound Section of TV Receiver.
  - (a) Identification of parts and sections.
  - (b) Tracing of various stages.

- (c) Preparation of circuit diagrams in stages.
- (d) Voltage and waveform measurement of various stages.

**Paper-III**  
**Time : 2 hrs.**

**TV SERVICING**  
**THEORY**

**M. Marks : 30**

**1. Fault Analysis Techniques :**

- Signal injection method : Signal levels and wave shapes at the input and output of different stages
- Systematic approach to fault finding
- Tools and equipments required
- Replacement guidelines using data books service manuals etc.

**2. Case Studies**

Different types of faults, their causes, impact on reception and rectification. Faults in following stages : Tunes, video IF and Sound IF CKTS, AGC, AFC, Deflection Ckts. EHT circuits. Chroma section and power supply section.

**3. Composite Fault Finding and Repair :**

- Discrete and IC oriented circuits of different stages. Exercises on simple and complex fault condition.

**4. Repair Organisations**

- Job cards, service cards, History sheets, stock keeping, Test benches, Field servicing, Job Scheduling.

**T.V. SERVICING**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Fault analysis and rectification : Colour TV receiver.
  - (a) Simulation of faults and their rectification in various stages.
    - (i) Individual Sections
    - (ii) Composite Sections
  - (b) Simulation of fault for geometrical distortions and rectification.
  - (c) Grey scale tracking adjustments
  - (d) Adjustment of colour killer

- (e) Adjustment of focus.
  - (f) Adjustment of chroma AGC
  - (g) Testing of degaussing coil.
2. Assembly, installation and testing of TV antenna and Boosters.

### **(iii) ENGINEERING DRAWING AND DRAFTING**

#### **Paper-I ENGINEERING DRAWING**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 80**

#### **Structure of Question Paper**

The question paper will consist of five parts.

- |    |  |          |
|----|--|----------|
| 1. | Drawing instruments & their uses   | 10 marks |
| 2. | Line lettering & dimensions  | 15 marks |
| 3. | Projection of planes & solids  | 25 marks |
| 4. | Sessional work : Student will show at least 15 articles (5 from each topic) which have been designed by him during the whole year. | 15 marks |
| 5. | Project work   | 15 marks |

#### **SYLLABUS**

##### **1. Pictorial Drawing :**

- (a) Limitation of orthographic projections. Difference between :
  - (i) Axonometric and oblique drawing.
  - (ii) Isometric and diametric projection.
- (b) Procedure for drawing isometric drawing/projection of square, rectangle, circle, arc and irregular curves and simple solid objects like cube, prism, pyramid, cylinder, cone and frustum of cone and pyramid.
- (c) Procedure for drawing isometric drawing/projection from the orthographic projections of simple blocks.
- (d) Procedure for drawing perspective drawing of cube and prism.

##### **2. Symbols and Conventions :**

Symbolic representation of surface roughness, machining, production method, roughness grade, sampling length, direction of layout etc. Symbolic representation of pipe fittings and valves. Welding symbols.

##### **3. Tolerances :**

Need of fits, limits and tolerances. Basic size, deviations, tolerances, allowances, deviation fit, interference fit and transition fit, hole basis and shaft basis system. Procedure for indicating above fits on drawing.

**4. Production Drawing :**

- (i) Explanation of information provided in drawing such as scale, finish, tolerance, processes, material list etc.
- (ii) Information needed for carpentering, metal fitting, electrical and diesel engine shops.
- (iii) Layout of following shops
  - (a) Carpentering
  - (b) Metal fitting
  - (c) Electrical (Household wiring)
  - (d) Diesel engine.

**5. Brick Masonry :**

Bricks, Types and uses of bricks, Characteristics of goval bricks. Important technical terms regarding bond-English and Flemish, Stecher, Header and Diagonal bond. Classification of brick masonry.

**6. Project work**

Layout of building, working out material quantity calculation.

**Note :** Minimum 25 sheets must be prepared based on above concept.

**Paper-II**

**WORKSHOP PRACTICE**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

1. Surveying-Division of surveying, instruments used for taking measurements, Units of measured, Basic principles of surveying precision of surveying.
2. Chain Survey - Chain, arrows, tapes Ranging Rods, offset rods, Pegs, methods of chaining, Errors in chaining. Chaining on sloping ground, numericals related to chaining, obstacles in chaining, recording of field book.
3. Leveling - Introduction, Principles of leveling, level & its different types, leveling staff, Terms used in leveling, adjustments of the level, finding the difference of level of two points level book and reduction of levels, errors in leveling and their prevention. Rise and fall method and height of collimation method.
4. Plane Table Surveying - Introduction, advantages, disadvantages of plane table surveying, Drawing Sheet paper, setting up of plane table, General

Instructions while plane table surveying. Two point & Three point problem, Errors in plane Tabling, Testing & adjusting the plane table, alidade.

5. Contouring - Contour & Contouring, contour Intervals, Horizontal Equivalent, characteristics of contour, methods of contouring, Examples of contouring, Drawing & Contour lines, Tracing the Contour Gradient for alignment of (Roads, Railways, canals etc.) use of contour maps.

### **WORKSHOP PRACTICE**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Folding and unfolding of chain.
2. Ranging a line
3. Chaining a line
4. Setting of Dumpy level
5. To find the difference in elevation between far points.
6. Setting of plane Table
7. Solution of two and three Point problem.
8. Drawing of contour sheets.

Minimum 25 sheets to be prepared related to above concepts.

**Paper-III**

### **REPRODUCTION OF BLUE PRINTS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

**1. Graphs and charts :**

Advantages of graphical representation. General rules to be followed while preparing a graph. Procedure for preparing the charts : Bar chart, percentage bar chart, pie chart and pictograph. Procedure for preparing recti-linear graph and identification of semi logarithmic and logarithmic graphs.

**2. Tracing :**

Usage of making instruments. Tracing paper/Tracing cloth usage and quality graph per set.

**3. Blue-Printing :**

Description and working of blue printing machine and materials.

**4. Ammonia-Printing :**

Chemicals used in ammonia printing. Description of ammonia printing machine.

**5. Zeroxing/Photostating :**

Description of zexing machine. Materials and chemicals used in zexing. Procedure of zexing, enlargement and reduction.

**6. Pentagraph :**

Description and its application.

**7. Planimeter :**

Use of planimeter for calculating areas of irregular plane figures.

**8. House wiring :**

**9. Building Estimates :** Types of estimate, standard method of taking out quantity, labour and material detailed and abstract estimate. Analysis of rates for simple items of works, Schedules of rates, specifications.

## REPRODUCTION OF BLUE PRINTS

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

**(Minimum 10 sheets)**

**Drawing of charts (1 sheet)**

Tracing	of	Sheet	No. 1	of	M/c	Drawing
"	"	"	No. 2	"	"	"
"	"	"	No. 3	"	"	"
"	"	"	No. 4	"	"	"
"	"	"	No. 5	"	"	"
"	"	"	No. 6	"	"	"
"	"	"	No. 7	"	"	"
"	"	"	No. 8	"	"	"
"	"	"	No. 9	"	"	"
"	"	"	No. 10	"	"	"
"	"	"	No. 11	"	"	"

Ammonia printing of at least 100 sheets from above tracings enlargement/reduction of at least 25% of tracing on zerox machine of at least 500 sheets. Drawing of nomographs (minimum 5 sheets).

### (iv) MECHANICAL SERVICING (GENL.)

**Fitting and Welding**

**Paper-I**

**Time : 2 hrs.****THEORY****M. Marks : 30****FITTING :****(i) HAND TOOLS**

Hammers, pliers, Spanners, torque & other wrenches, Punches, Files, tapes and dies, screw drivers. hacksaw, try squares, marking tools, V-Block, Surface plate, scribe, steel scale, marking gauge etc.

**(ii) MECHANICAL MEASUREMENTS**

Linear Measuring instruments, callipers, Vernier calliper, Micrometer, depth and height gauge, Angular Measuring instruments, level protector, Combination Set gauge, Field gauge, wire gauge, thread gauge, radius gauge, dial gauge.

**(iii) LIMITS, FITS AND TOLERANCES**

Need for limit systems, types of fits, viz. clearance fits, transition fits, interference fits elaborating the above with examples, Limit gauges and their applications, Limits and tolerances, and correlation of allowance with the type of fit.

**Part-B****WELDING :****(i) PRINCIPLES AND APPLICATION :**

Principles and applications of welding, brazing and soldering, classification of welding.

**(ii) OXY-ACETYLENE WELDING :**

Principle of gas welding, gas welding equipment. Low pressure and High pressure gas welding. Flame, parts of flame, Different types of flames and their uses, gas cutting, Fluxes their composition and application.

**(iii) ELECTRIC ARC WELDING :**

Introduction, Principle of arc welding, Arc welding equipment. Types of welding joints. Edge preparation, types of electrodes and their uses Flux properties and uses. Arc welding methods using AC and DC supply.

**(iv) SPECIAL WELDING TECHNIQUES :**

Electric resistance welding principle, description and working of spot welding machine.

**(v) Simple introduction Mig-Tig.****FITTING AND WELDING****Time : 3 hrs.****PRACTICAL****M. Marks : 50**



Description and working of machine - selection of blades for cutting different materials.

**5. GRINDING MACHINES :**

Types of grinding operations like cylindrical, internal and external surface grinding, magnetic and self centering chucks- types, shape and selection of grinding wheels- grinding wheels balancing and dressing - use of universal tool and cutter grinder.

**6. LUBRICANTS :**

Necessity of lubrication - types of lubricants, solid, semi-solid and liquid lubricants - properties of a good lubricant - designation of lubricating oils according to BIS - Application of different grades of lubricating oils with examples - coolants and cutting fluids.

**7. TRANSMISSION OF POWER**

Concept of power transmission - types of drives - belt and gear drives - types of belt drives - classification of gear trains, simple and compound gear trains - velocity ratio - calculation of driver and driven speeds - gear ratio - angular and peripheral speed - power.

**8. SIMPLE MACHINES :**

Definition of terms such as load, effort, velocity ratio (V.R.), mechanical advantage (M.A.), mechanical efficiency - types of levers, pulleys, fixed and movable pulleys - simple machines like simple wheel and axle, simple screw jack, worm and worm wheel, single purchase crab-industrial applications of the above machines.

**9. MACHINESHOP LAYOUT & MAINTENANCE OF MACHINES**

Layout of Machinshop & Maintenance of different types machines, General Instructions for machine-shop, purpose and importance of maintenance. Reconditioning and overhaling of machines.

**MACHINE TOOL OPERATION**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

- I. Drilling countersinking on drilling Machine.
- II. To perform saw milling.
- III. To perform Face Milling.
- IV. To perform form Milling.

- V. Preparing a square piece on a shaper
- VI. Cutting a V-groove in square thick iron sheet piece on the shaper
- VII. Grinding of twist drills
- VIII. Drilling boring and reaming on Drilling Machine.
- IX. Prepare a metal sheet according to given drawing.

## **ENGINEERING DRAWING**

### **Paper-III**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 80**

### **Structure of Question Paper.**

The question paper will consists of four parts.

**1. Drawing instruments & their uses.**

Line lettering and dimensions, Free hand isometric view from given diagram of Screw threads. 15 marks.

**2. Projections of planes and solids**

**25 marks**

**3. Development of surfaces and interpenetration of solids.**

**Or**

**Assembly Drawing**

**25 marks**

- 4. Sessional work :** Student will show at least 15 articles which have been designed by him during the whole year. 15 marks

### **SYLLABUS**

**1. ISOMETRIC DRAWINGS**

15 marks

Concept of true length and isometric length - conversion of orthographic views into isometric view of simple elements such as V-block, stepped block, hexagonal, bolt and nut- freehand isometric sketches of simple mechanical element.

**2. SECTIONING**

Concept of sectioning, cutting plane lines - simple example of sectioning such as a hollow shaft pulley and shaft, flange roaping, simple journal bearing bracket.

**3. SCREW THREADS**

Introduction of various screw elements such as pitch load, depth, nominal diameter, core diameter. Single and multi start - left and right - internal and external threads with suitable examples - convention representation of thread portions. General thread profiles such as vee, including pipes and coupling, square, knuckle.

**4. DEVELOPMENT OF SURFACES AND INTERPENETRATION OF SOLIDS**

Concept of solids such as cylinder, prism and pyramid-development of surfaces of these solids. Interpenetration of cylinders of equal and different diameters with their axis intersecting at right angle.

**5. ASSEMBLY DRAWING**

Concept of assembly and disassembling - Assembly drawing of simple elements such as pulley and shaft, flange coupling, knuckle joint, screw & Cotter joint.

**6. RIVTS AND RIVTS JOINTS**

Lap joint, Butt joint (single rivts, Double rivts).

**(V) FURNITURE MAKING AND DESIGINING****Furniture Furnishing & Finishing Materials****Paper-I****Time : 2 hrs.****THEORY****M. Marks : 30****(a) Fixing and Fastening :**

Different types of nails, dowels, screws, nut-bolts, washers, catches, locks, latches and hinges : their characteristics, uses, cost, selection and care in furniture making.

**(b) Ancillary Materials :**

Decorative laminates, glass, aluminium alloy structures, plastics, cast iron and mild steel items and uses, cost, selection and care in furniture making.

**(c) Adhesives :**

Animal glue, casein-glue, synthetic resin, putties, natural latex adhesives, their characteristics and uses and industrial adhesives.

**(d) Upholstry :**

- (i) Various types of tapestries involving cotton, silk, synthetic, woolen, rexine, leather : their uses, cost, selection and care in furniture making.
- (ii) Cushioning materials : springs, jute, cotton, foams, rubber, polyfill fibre, their uses, cost, selection, care in furniture making.

**FURNITURE FURNISHING AND FINISHING MATERIALS****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

1. Exercises in jointing with the help of nails and screws.  
Exercises in jointing with the help of adhesives.

3. Exercises of fixing decorative laminates on plain, curved surfaces and on edges.
4. Practice in cushioning and fixing tapestries on the furniture items already prepared.
5. Exercises of upholstery - prepare a file with latest samples and their cost.

**Paper-II****TOOLS & PROCESSES****Time : 2 hrs.****THEORY****M. Marks : 30**

- (a) **Power drills** : working of a power drill, different types of bits and their selection, care and maintenance, drilling techniques and precautions involved in drilling.
- (b) **Circular Saw** : Different types of blades, their selection, adjusting and setting. Working details, sawing techniques and precautions involved, special purpose saw used in cutting rotates, tapers and moulding.
- (c) **Band Saw** : Constructional details, saw blades & their specifications.
- (d) **Planers** : Working principles & constructional details, and uses.
- (e) **Sanding machine** : Types, functioning, selection, use, care and maintenance.
- (f) Wood turning Lathe-details, basic tools used in turning, working principle, care and maintenance, precautions while handling.
- (g) Introduction & working of five in one compact Machine.

**TOOLS & PROCESSES****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

- (a) Practice on wood working lathe for preparing cylindrical objects of different diameter, recessing and contouring.
- (b) (i) Preparation of Dovetail joint and glued joint.  
(ii) Preparation of Exposed wedge joint.
- (c) Preparation & polishing of the following :
  1. Chair without arms
  2. Table with drawers
  3. Box type settee
  4. Black Board
  5. Notice Board with glass panels.
- (d) Preparation of following wooden furniture item using aluminium alloy and mild steel structures :
  - (i) Chair with/without arms.
  - (ii) Study table.

- (iii) Bench
- (iv) Desk.
- (e) Repair of old furniture/school furniture, replacement of parts and polishing.

**Paper-III****FURNITURE DESIGN****Time : 2 hrs.****THEORY****M. Marks : 30****(a) Designing and detailing of the following type of furniture :**

- (i) Movable furniture
- (ii) Upholstered furniture
- (iii) Built in furniture and fixtures
- (iv) Ornamental furniture
- (v) Mirrors & pedestal lamps

**(b) Estimating :**

- (i) Principles of estimating for all types of furniture items, direct/indirect costs, overheads.
- (ii) Preparing materials estimates for different types of furniture.
- (iii) Working out labour required for a given job.
- (iv) Preparation of cost estimates for new and old work.

**FURNITURE DESIGN****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

- (a) At least 15 sheets regarding furniture design should be prepared.
- (b) Preparation of furniture album with the help of sales literature, newspaper cuttings and allied materials.
- (c) Local visits to local carpenter workshops/showroom. (at least 4 visits).

**(VI) MECHANICAL SERVICING (AUTO)****Paper-I****WORKSHOP TECHNOLOGY****Time : 2 hrs.****THEORY****M. Marks : 30**

**LATHE :** Introduction to Lathe and its classification and Constructional features of centre lathe. Attachments and accessories of lathe. Introduction to CNC (Computer Numerically Control.) Lathe machine.

**WELDING :** Basic principle of gas and arc welding. Difference between gas and arc welding, arc welding transformer set, arc and gas welding equipments, Introduction to electrodes, flux, welding joints, soldering and brazing.

**GRINDING :** Constructional features of grinder, bench and its working.

### **WORKSHOP TECHNOLOGY**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Use of tools, equipments used in a welding shop.
2. To learn the various safety measures used in welding shop.
3. To learn the current setting of the transformer according to the thickness of the job and selection of welding rod accordingly, electric arc welding practice.
4. To learn starting and stopping of flames of gas welding.
5. To learn to get the correct character of flames and to form the bead with gas welding.
6. To exercise centering of given job on central Lathe machine.
7. To do two exercise each in plain turning, taper turning, thread cutting, drilling, boring, knurling, chamfering and parting off.

### **Paper-II      GARAGE PRACTICE AND MANAGEMENT**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

#### **AUTO SERVICING**

- Study of Vehicle maintenance and repair.
- Study of vehicle maintenance and maintenance schedule.
- General service procedure for four wheelers. Servicing of engine, clutches gearbox, propeller shaft, final drive and wheels.
- Study of faults of -
  - Engine-does not turn over, does not start, runs but misses, locks power, over heats, noisy operation, stalls and back-fires.
  - Excess fuel consumption, smoky exhaust, excess oil consumption, etc.
  - Clutch-slips while engaged, grabs or chatters, drags, noisy, incorrect pedal play.
  - Gear Box- noisy, hard gear shifting, slip in gears.
  - Universal Joint-worm-out cross, less bearing life.
  - Propeller shaft defects.
  - Differential - continuous noise growing while rounding a curve.
  - Wheels-Tyre ware types, tyre cracks etc.

- Chassis & Body - Hard & rough ride, vehicle' sway, sagging spring, distortions in frame and body.
- Steering & front suspension - Hard steering, wheel wandering, wheel pulling, front wheel shimmy, wheel tramp, excess steering play etc.
- Brake-hard brake, pedal goes to floor, dragging and noisy brake.
- Road Testing Procedure.
- Check wheel balancing, toe-in, toe-out, camber angle adjustment, Brake/Clutch adjustment.

### **Management**

1. Garage location & layout. Types, scope, selection of site for garage, layout of building and machinery.
- 2. Maintenance of shop, safety and first aid facilities.**
  - (a) Safety ensured by building aspects.
  - (b) Safety ensured by machinery and equipments.
  - (c) Safety ensured based on the human attitude.
- 3. Book Keeping**
  - (a) Registers to be maintained.
  - (b) Method of accounting transactions.
  - (c) Profit and loss account.
- 4. Elements of costing.**
  - (a) Direct labour cost.
  - (b) Material cost.
  - (c) Overhead cost.
- 5. Basic inventory control and store keeping.**
  - (a) Concept of maximum stock, safety stock, lead time and economic recorder quantity, ABC analysis.
  - (b) Duties of store keeper.
  - (c) Method of keeping store.
6. Elements of shop act regarding working hours, holidays; definition of worker.
- 7. Insurance :** Purpose and provision of third party insurance.
- 8. Salesmanship**
  - (a) Duties of Salesman
  - (b) Personal qualities of salesman

- (c) Advertising and publicity.
- (d) As per new motor vehicle act.

**9. Motor Vehicle rules As per New Motor Vehicle Act.**

- (a) Light duty vehicle.
- (b) Heavy duty vehicle.
- (c) Stage carriage.
- (d) Public carrier.
- (e) Private carrier.
- (f) Invalid carriage.

**10. Rules Relating to :**

- (a) Size of letters and background colour of number plates of different types of vehicles.
- (b) Location of lights and masking.
- (c) Minimum space required for passenger, gang way, floor to ceiling, front and overhang.
- (d) Safety aspect in terms of condition of tyre, brakes, steering, exhaust.
- (e) Traffic signs signs found installed on the road.
- (f) Signalling by driver and what it communicates to other road users.
- (g) Prescribed forms for driving licence, registration, permit, fitness certificate.
- (h) Offences and penalties of driving vehicle without
  - (i) Driving Licence.
  - (ii) Registration.
  - (iii) Permit.
  - (iv) Fitness Certificate.
  - (i) Euro/Bharat pollution control norms.

## **GARAGE PRACTICE AND MANAGEMENT**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Servicing of the fuel filter.
2. Servicing of fuel injection pump.
3. Servicing of fuel injector.
4. Air Bleeding from fuel supply system.

5. To study and sketch the pneumatically operated governor mechanism of fuel injection pump of a multi cylinder pump.
6. To study and sketch the mechanical governor mechanism of a multi cylinder fuel injection pump.
7. Checking & adjusting of ignition timing.
8. To study and carryout the fuel injection pump timing.
9. To dismantle a single cylinder diesel engine, clean components, inspect report on the condition of parts, suggest remedial measures, repair, reassemble and test.
10. To dismantle a multi cylinder diesel engine of a 4 wheeler, clean components, inspect report on the condition of parts, suggest remedial measures, repair, reassemble and test.
11. Checking of cylinder bore.
12. Fitting of bearings, bushes and shells.
13. Engine Tuning.
14. To obtain all the prescribed forms by Directorate of Transport and fill up details for obtaining.
  - (a) Driving licence.
  - (b) Fitness certificate.
  - (c) Permit etc.
15. To study and draw neat sketches of different road signals and signs.
16. To inflate tyres with specified pressure and tighten all wheel nuts.
17. To prepare a costing and estimate statement for a repair.
18. Visit to nearby auto mobile services.
19. To carry out road test and check exhaust for emission of carbon monoxide.

### **Paper-III      AUTOMOBILE SUSPENSION & CONTROLS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

- I. Frames and Body work :** Function of frames. Types of frames for 2, 3 and 4 wheelers. Forces acting on the frames. Frames alignment. Types of body and their repair procedures, body denting, painting and polishing. Body accessories and fittings. Trouble shooting of frame and its maintenance.

- II. Suspension :** Function of suspension system. Desirable characteristics of suspension system. Types of springs & shock absorbers used and their details. Spring mountings, Torsion bar, Rear axles. Suspension and their types. Independent suspension system used on front wheels. Trouble shooting of suspension system and its adjustments.
- III. Front Axle and Steering :** Constructional features of front axle, Front assembly. Steering wheel and column. Steering geometry. Ackerman linkage, Camber, castor, king pin inclination, Toe-in, Toe-out on corners. Trouble shooting of steering and front axle units and their adjustments.
- IV. Brakes :** Functions of brakes, Layout of brake system, stopping, stopping distance. Types of brakes-mechanical and hydraulic, parking brake. Constructional details of mechanical and hydraulic brake system. Brake drum, brake shoe and lining material, Simple master cylinder and wheel cylinder. Trouble shooting of brakes and their adjustments, bleeding of brakes.
- V. Wheels and Tyres :** Types of wheel discs and rims and their constructional features, tyre pressure, spoked wheels, and casted wheels. Types of tyres and their constructional features. Tyre specifications, tyre rotation, causes of tyre wear, tyre retreating, trouble shooting of tyres and their maintenance.
- VI. Electrical System :** Objectives, lighting circuits, layout and its function, lamps, functions Head Light, Tail Light, and colour coding of cables, connectors, switches, wind screen wiper, horn, gauges (fuel level and temperature).

### **AUTOMOBILE SUSPENSION & CONTROLS**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. To dismantle the front wheel, handle bar assembly of a two wheeler, clean inspect report on the condition of components, repair, reassemble, adjust and lubricate.
2. To dismantle the components of rigid front axle beam of a four wheeler, clean inspect report on the condition, repair, reassemble and lubricate the parts.
3. To dismount the steering gear and column assembly from a four wheeler, dismantle, clean, inspect report on the condition, repair, reassemble, refit and adjust.
4. To dismount the independent front suspension of a four wheeler, dismantle, clean, inspect report on the condition, repair, refit, adjust.
5. To dismount the leaf spring suspension of rear axle, dismantle, clean inspect report on the condition, repair, refit and lubricate.

6. To dismount the telescopic shock absorber of front wheel of two wheeler, clean, inspect report on the condition and repair and refit.
7. To dismount the wheel assembly from a two wheeler, dismantle, clean, inspect report on the condition of wheel, rims, tyre, tube, rectify defects of tube, refit and remount.
8. To dismount the wheel assembly from a four wheeler, dismantle, clean, inspect report on the condition of wheel, rims, tyre, tube, rectify defects of tube, refit and remount.
9. To dismantle the disc type brakes, clean inspect and assemble and remount.
10. Bleeding of brakes.
11. Trouble shooting of lighting system.
12. Headlight, beam alignment & focusing.
13. Driving practice and road testing.

## **(VII) COMPUTER TECHNIQUES**

### **Paper-I. OBJECT ORIENTED PROGRAMMING IN C++**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

**OOPS** : Software Quality factors (Robustness, correctness, portability etc.), External and Internal quality factor, Modularity, Reusability, Genericity and Overloading, Object, Oriented philosophy, Top down design method, Object Oriented design.

**C++ Language Features** : History, Structure of a C++ program, function prototyping, C++ operators, Variable declaration. Default argument functions, inline functions, inline v/s macros; const declaration, const v/s #define, Variable references; Function overloading, Default argument functions; external "C" declaration, Reference v/s pointer, Memory allocation and deallocation using new and delete operators; IO streams, cout, cin and cerr object; Comparison of cout and cin with print() and scanf().

**C++ Class concept** : Data members and member functions (manager, accessory and setter functions). Access specifier : public, private and protected; Reference, static, const and pointer variables as data member, Magic pointer (this), Operator overloading; Default member functions : constructor, destructor, assignment operator and copy constructor; Constant and static member functions, Interface and implementation; Object the instances of the classes, Object creation, accessing data members using objects; Classes v/s objects; Array of objects and constant objects; Class objects as members of other classes, initialization v/s assignment; User defined constructor, Friend functions and friend classes; Empty class, Overloading of new and

delete operators etc.; Account, complex, string example etc. would be discussed; Type conversion; Primitive to primitive, typecasting operators, Primitive to user defined : constructor, User defined to primitive conversion operator; User defined to user defined : constructor and conversion operators.

**Inheritance** : Base and derived classes; What goes into derived class, Types of derivation : public, private and protected; Function overriding, Overriding v/s overloading; Inheritance v/s containment ('is a' and 'has a relationship'); Types of inheritance : single, multilevel, multiple, repeated ; Standard conversion between base and derived, Virtual derivations.

**Polymorphism** : Virtual functions, virtual table (Shape class etc.); Polymorphism, Static and dynamic binding, runtime overheads; Pure virtual functions, Abstract Base Class, Interface, Virtual destructor; Multiple and Repeated inheritance, Role of virtual base class, int. Vector, protected int vector, range in vector etc.

**C++ File I/O** : ios stream input - istream class, stream output - ostream class; Built-in manipulator functions: endl, dec, hex, oct, ws, ends, flush, setw, setfill; User defined manipulator, File input if stream class, file output of stream class; opening and closing files; open() and close(); Reading and writing to and from the file read() and write(); eof(), file pointers and their manipulator; seekg(), seekp(), tellg(); Streambuf class and filebuf class.

**Templates** : Function Templates, Template functions; Class Templates and Template classes, Overloading v/s Templates; Stack, Vector Templates etc.

**Exception Handling** : Exception handling v/s traditional error handling; Exception classes; try, throw, catch keywords.

**Namespaces** : Namespace concept, Declaring and using them in applications, Namespace alias etc.

**Cast Operators** : const cast, static cast, dynamic cast and reinterpret cast.

## **OBJECT ORIENTED PROGRAMMING IN C++**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

Each student may perform at least 5 to 10 programs based on the following topic :

1. Simple programs based on C++ variable, constant.
2. Programs using built in (library) functions, user, defined functions, operators, if, nested-if, switch and various loops.

3. Programs on Inline functions and prototypes, overloading of functions, classes, nesting of functions.
4. Programs on constructor.
5. Programs with C++ Class.
6. Programs using arrays and arrays of objects.
7. Programs on operator overloading.
8. Programs on string manipulation using operators.
9. Programs on inheritance.
10. Programs on pointers, virtual function and polymorphism.
11. Programs on point (setting a pointer) to objects, classes and functions.
12. Operations of file pointers for input and output.
13. Programs on file operation in C++.

**Paper-II****DESK TOP PUBLISHING****Time : 2 hrs.****THEORY****M. Marks : 30****DTP FUNDAMENTALS AND BASICS OF PAGEMAKER**

**Introduction to DTP :** What is Desk Top Publishing; Introduction to different DTP software; Uses of DTP and Print documents; Advantages and disadvantages of DTP over word processing; Hardware and software requirements for DTP; Installation of DTP software and fonts.

**Basics of Pagemaker :** Document Planning, Page Layout, Margin, Tabs, Rulers, Header, Footer, Fonts, Styling, Frames, Master Page concept, WYS/WYG etc; Use of file, edit, page, frame, font, graphics and option menu.

**Corel Draw :** Installation of Corel Draw and minimum configuration requirements; Managing files, Using the drawing tools; Manipulating the objects; Moving the objects, Reshaping objects; Previewing your drawing, filling and outfitting the objects, shaping objects, changing object position; Surfing through opening interface for all tools and menu. Working with text, editing text, modifying special effects, fonts and choosing artistic and paragraph text, Color, modeling system, creating custom colors; customizing color palettes; Using the Corel Clip board - Working with objects, Zooming, Dragging and other features. Creating special effects - Object perspective, Envelopes, Blending objects, Extrusion; Corel Photo Point; Corel chart; Corel movie; Use of contour and lens effects; Cropping and bitmaps.

## **POWER POINT AND PHOTOSHOP**

**Ms-Power Point** : Introduction working with Power Point; Creating a new presentation; Saving and closing a presentation. Opening and existing presentation; Inserting and deleting text, Moving and copying text, Formatting text, changing text attribute styles; Changing bullet characteristics, Aligning, Line setting, Paragraph setting; Changing slide color scheme; Using masters; Slide, Title, Handout, Notes, Editing text-viewing a presentation in different view, Adding and deleting slide, Selecting text, More about presentation; Drawing objects like lines, arcs, rectangles, ellipses; Drawing freeform shapes; Using auto shape feature in Power Point; Rotating objects, Modifying colors and lines; Adding headers and footers; Inserting Ms-Excel worksheet, Printing presentation components.

**Adobe Photoshop** : Installation of Photoshop, configuration and requirements, Managing files, forms, line, space, texture, color, typography, layouts etc. Still life layouts, color layouts, poster design, Image scanning, Resolution, size file and formats of images, gray scale and color option, file conversion reducing the memory space.

### **MS ACCESS :**

**Database Management** : Database examples, Records, Field, Field types.

**Getting Started** : Starting Access, Creating a database, Creating a table, Using a table, Viewing records Record numbers. Displaying all records. Closing the database.

**Creating A Database** : Planning the structure, Creating the structure, Modifying the structure, Delete Insert and rearrange fields in a table.

**Entering & Deleting Data** : Appending records, Saving the database. Editing records, Moving to the ends, Deleting records. Using Datasheet.

**Form** : Creating a form, View the records in a form. Add and save the records with a form, Print, Save and close a form. Customizing a form. Working with controls.

**Querying A Database** : Creating a Query, Modifying a Query, Joining Tables, Creating relationship between tables using criteria, Sorting records.

**Reports** : Creating, printing and saving reports.

**Index** : Viewing and editing Indexes, Creating Multiple Field Indexes.

**Database Structure** : Fields, Records, Records data types, Relational database, management systems, Field structures and relations.

**Relational Database Management** : Input masks, Query structures, Reports structures.

**Creating Relational Databases :** Table structure modification, Relationship types, Setting Relationships between Tables, Viewing and Editing existing Relationships, One to many relationship, Data entry Referential Integrity.

**SQL :** Using SQL in Microsoft Access, Using SQL to View and Modify Queries, Creating Table with Access SQL. Writing Select Queries in SQL, Using the SQL Aggregate Function: SELECT, FROM, WHERE, ORDER BY, AS, GROUP BY, HAVING clause.

**Relational Queries :** Creating query, sub query, Adding to query view, Mathematical expressions, Field captions.

**Relational Reports :** Creating, Linking tables.

## **DESK TOP PUBLISHING**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

### **I. PAGEMAKER**

1. Create a document using table and graphic using MS-WORD.
2. Installation of Pagemaker.
3. Create style sheets.
4. Preparation of one page/two columns.
5. Generate the same page layout of today's Newspaper on your computer screen.
6. Generate at least four page brochure of a company with its logo on each page.
7. Use of header, footer, foot notes in designing of page layout.
8. Development of multi chapter publication with contents, index, graphics and tables.
9. Designing of corporate logos and image rendering.

### **II. CORELDRAW**

1. Learning and Practicing CorelDraw.
2. Creating an artistic sketch in CorelDraw.
3. Linking and integrating the CorelDraw files in Web Pages.

### **III. POWERPOINT**

1. Design simple presentation using colors and fonts.
2. Design presentation advance features using animation and 3-D features.

### **IV. PHOTOSHOP**

1. Installation practice of Photoshop.
2. Learning and Practicing Adobe Photoshop.
3. Creating and optimizing pictures and images in Photoshop.
4. Saving the pictures in various file formats.

5. File conversion and reducing the memory space.
6. Pasting photographs and Images using Photoshop.
7. Linking and Integrating the Photoshop files in Web Pages.

#### **V. MS ACCESS**

1. Starting and Quitting.
2. Practicing using the Microsoft Access help facilities.
3. Practicing opening viewing and closing the various objects in the Database.
4. Creating, naming and saving a new blank Database.
5. Create, naming and saving tables in the Database.

#### **VI. SQL**

1. Using the select Query window, select tables Practice joining and deleting the join lines between different tables.
2. Create relationship between different tables.
3. Create and run the different Queries on tables.
4. Practice sorting the records in your tables into specific orders.
5. Create Queries to retrieve the Data as required.

### **Paper-III      ADVANCED MATHEMATICS AND COMPUTER**

#### **COMMERCIAL APPLICATIONS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 80**

#### **PART-A**

1. Matrices and Determinants, Simultaneous linear Equations.
2. Differentiation.
3. Integration.
4. Differential Equation.

#### **PART-B**

##### **1. INTRODUCTION TO DATA PROCESSING**

Introduction to DBMS and RDBMS : Limitation of the file processing system. Advantages and Disadvantages of DBMS, Introduction to Data Models-Physical Data Models, Object based Data Model.

(i) ERD (Entity Relationship diagram) (ii) Normalisation (1NF, 2NF, 3NF) Record Based Data Models. Relational HDB (Hierarchical Database Model), NDB (Network Database Model), E.F. Codd's Rules, Different types of Key attributes.

##### **II. SYSTEM ANALYSIS AND DESIGN**

Introduction, Need for system analysis and design, Steps and techniques of system analysis, Role of system analyst; System development life cycle, Data flow diagram, Documentation.

**III. FINANCIAL ACCOUNTING PACKAGE**

Introduction to accounting, Objectives, Use of TALLY package and its operations. Security measures, Company creation, Accounting heads, Voucher entry; Balance Sheet; Display, Trial Balance.

**(VIII) MANUFACTURING OF SPORTS GOODS****Paper I. WOOD BASED SPORTS GOODS****Time : 2 hrs.****THEORY****M. Marks : 30**

1. Raw Materials used for Carrom Board, Cricket Bat, Shuttle Cock, Wickets and Bails (For Semi-goods).
2. Various types of finishing materials used in sports goods industry.
3. Economy measures to be taken in wood based sports industry.
4. Procedure for calculating the cost-price of a finished product.
5. Export and Import of sports goods, detail study of specialities related to the Sports Industry (wood).
6. Drawing, designing & standard specifications of the following.
  1. Carrom Board
  2. Wickets and Bails
  3. Cricket Bat
  4. Shuttle Cock

**WOOD BASED SPORTS GOODS****Time : 3 hrs.****PRACTICAL****M. Marks : 50**

1. Identification & usage of tools.
2. Practice in finishing the semi-finished product.
3. Practice in making joints and application of adhesives.
4. Making and calculating the cost of the following sports items.
  1. Carrom Board
  2. Shuttle Cock
  3. Cricket Bat

**Paper-II LEATHER AND SYNTHETIC BASED SPORTS GOODS****Time : 2 hrs.****THEORY****M. Marks : 30**

1. Raw Materials used for making Basket Ball, Rugby Ball, Cricket Ball/Hockey Ball.
2. Various types of finishing materials used in sports goods industry.



- (i) All types of leg guards, shin guard, arm guard, chest guard, face mask, elbow guards, head guards, abdominal guard, boxing head guard, punching kit.
- (ii) All types of nets.
- (iii) Sports cap.
- (iv) Leather grips.

### **TEXTILE BASED SPORTS GOODS**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Practice in cutting patterns.
2. Practice in cutting components.
3. Making and calculating the cost of the following sports items :
  - (i) Cricket leg guards.
  - (ii) Hockey leg guards.
  - (iii) Abdominal guards.
  - (iv) Badminton net.
  - (v) Volleyball net.

### **(IX) MANUFACTURING OF LEATHER GOODS**

#### **Paper-I. PATTERN CUTTING AND DESIGNING**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

1. Drawing and designing of patterns e.g. portfolio brief cases, hand bags, hand gloves, watch straps, apron.
2. Various materials required for pattern cutting in cottage industry & small industry, their utility and importance.
3. Various types of machinery used in pattern cutting i.e. Pattern Shears, Pattern Vice, Grading Pantograph, its care and maintenance.
4. Various types of packing material for finished product.
5. Wastage-its proportion, limit and utilization.
6. Computer based Drawing and Designing pattern.

### **PATTERN CUTTING AND DESIGNING**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Practice in cutting components.
2. Making and calculating the cost of the following : portfolio, hand bags, hand gloves, watch straps.

3. Preparation and practice of ladies purse, chess board, seat cover, hand bags, watch straps and key cases from waste material.
4. Computer based Drawing and Designing of pattern.

### **Paper-II. NOVELTY LEATHER ITEMS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

1. Introduction and scope of leather industry with special reference to leather footwear, leather-wears and leather based sports goods.
2. Synthetic raw materials used in leather goods trade, their availability, suitability, characteristics and comparison with leather.
3. Various types of auxiliaries and grinders used in leather goods industry.
4. Proper care, maintenance and precautions regarding raw material, finished leather product in the workshop.
5. Sequence of operations while making the following : portfolio, hand bags, hand gloves, watch straps, apron.
6. Finishing of leather goods, its processes, defects and remedies.

### **NOVELTY LEATHER ITEMS**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Identification of various types of auxiliaries.
2. Identification of various types of threads and adhesives.
3. Identification of various types of synthetic raw materials.
4. Preparation and practice of leather laces.
5. Preparation and practice of portfolios.
6. Preparation and practice of dak pad.
7. Preparation and practice of dressing case.
8. Preparation and practice of novelty watch strap.

### **Paper-III INDUSTRIAL LEATHER GOODS**

**Time : 2 hrs.**

**THEORY**

**M. Marks : 30**

1. Introduction and importance of industrial leather goods.
2. Various types of raw material required for the manufacturing of industrial leather goods.

3. Various auxiliaries and grinders used in industrial leather goods.
4. Sequence of operations involved while making the following : cycle saddle top, industrial gloves, leather belting, leather aprons, safety mines shoes.
5. Cost calculations of the above finished goods.

### **INDUSTRIAL LEATHER GOODS**

**Time : 3 hrs.**

**PRACTICAL**

**M. Marks : 50**

1. Identification and selection of raw material used in industrial leather goods.
2. Preparation and practice of various types of laces.
3. Pattern cutting and practice of cycle, scooter, moped, motor cycle seat covers, leather aprons, industrial gloves.
4. Preparation and practice of cycle, scooter, moped, motorcycle seat covers leather aprons, industrial gloves.

### **V. HUMANITIES AND OTHERS GROUP**

#### **COMMERCIAL ART**

#### **Paper-I. COMMERCIAL ART AND DRAWING**

**Time : 5 hrs.**

**PRACTICAL**

**M. Marks : 80**

#### **Structure of Question Paper**

The question paper will consist of 3 parts.

**No. 1**

**(30 marks)**

This part will be based upon unit I of the syllabus. Two questions will be asked and the student will do any one of these. The distribution of marks will be as follows :

Composition	10 marks
Expression	10 marks
Finishing	10 marks

**No. 2**

**(30 marks)**

This part will be based upon unit II of the syllabus. Two questions will be asked and the student will do any one of these.

Distribution of marks will be as follows :

Composition	10 marks
Expression	10 marks
Finishing	10 marks

**No. 3**

**(20 marks)**

This part relates to sessional work. Student will show at least 15 articles relating to Drawing any lay-out which have been designed by him during the whole academic year.

### **SYLLABUS**

**Unit I** **Marks : 30**

1. Drawing from life full figure Monochrome/Colours.

Or

2. Drawing from Nature/Memory Land Scape, Monochrome/Colours

**Unit II** **Marks : 30**

3. Book illustration for specific purpose in pen and ink or half tone work.

Or

4. Designs of letter heads with black and white ink/colours.

**Unit III Sessional Work** **Marks : 20**

Atleast fifteen articles should be prepared by the candidates.

The Practical Examiner will award the marks.

### **Paper-II. DSSIGN AND LAY-OUT**

**Time : 5 hrs.** **PRACTICAL** **M. Marks : 80**

#### **Structure of Question Paper**

The question paper will consist of 3 parts.

**No. 1** **(30 marks)**

This part will be based upon unit I of the syllabus. Two questions will be asked and the student will do any one of these. The distribution of marks will be as follows :

Composition 10 marks

Expression 10 marks

Finishing 10 marks

**Unit 2** **Marks : 30**

This part will be based upon Unit II of the syllabus. Two questions will be asked and the student will attempt any one. Distribution of marks will be as follows :

Composition 10 marks

Expression 10 marks

Finishing 10 marks

**No. 3** **(20 marks)**

This part relates to sessional work. Student will show at least 15 articles relating to Drawing and lay-out which have been designed by him during the whole academic year.

### **SYLLABUS**

#### **Unit I**

**Marks : 30**

1. Preparation of Textile designing such as Sari-Border, Curtain and All over pattern etc.

Or

2. Preparation of various types of posters.

#### **Unit II**

**Marks : 30**

3. Preparation of lay-out with given component such as Insignia and Trade mark designs.

Or

4. Book illustration, Story illustration.

#### **Unit III Sessional Work**

**Marks : 20**

Atleast fifteen articles should be prepared by the candidates.

The Practical Examiner will award the marks.

### **Paper-III. TECHNICAL THEORY OF COMMERCIAL ART**

**Time : 3 hrs.**

**THEORY**

**M. Marks : 80**

#### **Structure of Question Paper**

In all eight questions will be set from the prescribed syllabus. Student will attempt any five questions from these. Each question will carry 16 marks. A question may have two or more parts. The questions will be evenly distributed from the syllabus.

### **SYLLABUS**

1. Early Indian cave paintings, their techniques and style of illustrations.
2. Ajanta paintings and their techniques Subject Matter and characteristics of illustrations.
3. Designs of Indus Valley Seals and their artistic value.
4. Jain Manuscripts illustrations.
5. Pala Manuscripts illustrations.
6. Mughal Manuscripts illustrations and their techniques, subject matter and characteristics.
7. Pahari Manuscripts illustration and their techniques, subject matter and characteristics.
8. Theory of colours and various types of colours.
9. Principles of designs and various types of designs.
10. Mauryan period animal designs on pillars.