

(a)	Practicals (2)	15 Marks
(b)	Drawing/ Sketch	05 Marks
(c)	Viva-voce	05 Marks
(d)	Sessional Work	05 Marks
Total		30 Marks

ACTIVITY

Industrial Visits (Two) to any industry/manufacturing plant to acquaint the students with the present - day methods & technology for better conceptual understanding.

COURSE STRUCTURE CLASS XII (2024-25)

One Paper (Theory): 3 Hours

70 Marks

One paper (Practical): 3 Hours

30 Marks

S. No.	Unit Name	Marks	Periods
I	Isometric Projections of Solids	25	60
II	Machine Drawing A. Drawing of Machine parts B. Assembly Drawing and Dis-assembly drawings 1. Bearings 2. Rod joints 3. Tie-rod and Pipe joint	45	114
Practical		30	66
Total Marks		100	240

THEORY

Unit I: Isometric Projection of Solids

60 Periods

- (i) Construction of isometric scale showing main divisions of 10mm and smaller divisions of 1 mm, also showing the leading angles. Drawing helping view/s such as triangles, pentagon, hexagon, etc., using isometric scale.
- (ii) Isometric projection (drawn to isometric scale) of solids such as cube; regular prisms and pyramids (triangular, square, pentagonal, and hexagonal); cone; cylinder; sphere; hemisphere. The axis and the base side of the solid should be either perpendicular to HP / VP or parallel to HP and VP.

- (iii) Combination of any two above mentioned solids keeping the base side parallel or perpendicular to HP/VP and placed centrally together (Axis of both the solids should not be given parallel to HP).

Note:

1. Hidden lines are not required in isometric projection.
2. Indicate the direction of viewing.

Unit II: Machine Drawing (as per SP46: 2003)

114 Periods

A. Drawing of machine parts

- (i) Drawing to full size scale with instruments. 30 Periods

(Internal choice will be given between any two of the following).

Introduction of threads: Standard profiles of screw threads - Square, Knuckle, B.S.W., Metric (external and internal); Bolts – Square head, hexagonal head; Nuts – Square head, Hexagonal head; Plain washer, Combination of nut and bolt with or without washer for assembling two parts together.

- (ii) Free-hand sketches 10 Periods

Conventional representation of external and internal threads; Types of studs – Plain stud, Square-neck stud, Collar stud; Screws (round-head, cheese-head, 90⁰ flat counter sunk-head, hexagonal socket head and grub-screw); Types of rivets – Snap head, Pan head (without tapered neck), Flat head, 60⁰ countersunk flat head.

B. Assembly drawings and Dis-Assembly drawings

(Internal choice will be given between an Assembly drawing and a Dis-Assembly drawing). 74 Periods

1. Bearings
 - (i) Open-Bearing
 - (ii) Bush- Bearing
2. Rod-Joints
 - (i) Cotter-joints for round-rods (Sleeve and cotter joint)
 - (ii) Cotter-joints for square rods (Gib and cotter-joint)
3. Tie-rod and Pipe-joint
 - (i) Turnbuckle
 - (ii) Flange pipe joint

Note:

1. *In all Assembly drawings, half sectional front view will be asked. Side/End view or Top View/Plan will be drawn without section.*

2. *In all Dis-assembly drawings, only two orthographic views (one of the two views may be half in section or full in section) will be asked of any two parts only.*
3. *(a) In all sectional views, hidden lines/ edges are not to be shown.*
(b) In all full views, hidden lines/edges are to be shown.

PRACTICALS

66 Periods

(i) To perform the following tasks (for One only) from the given views of the prescribed fifteen (15) machine blocks in **ANNEXURE-I**.

Value-Points

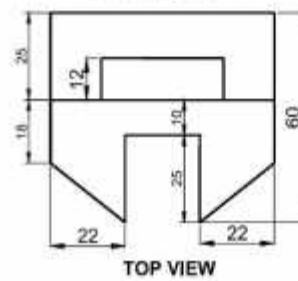
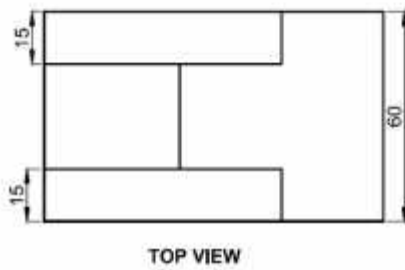
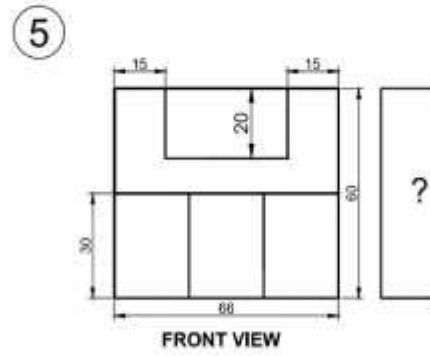
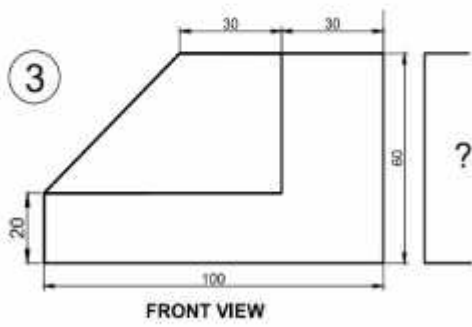
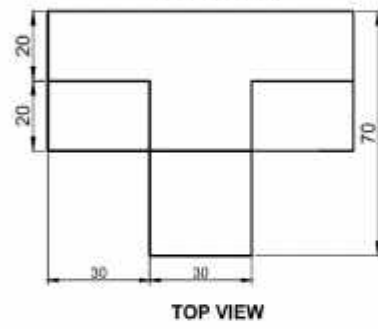
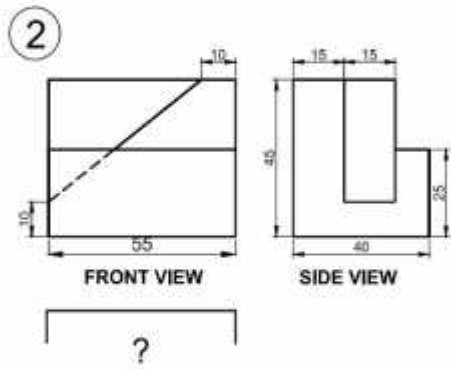
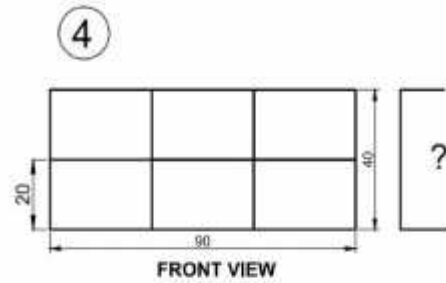
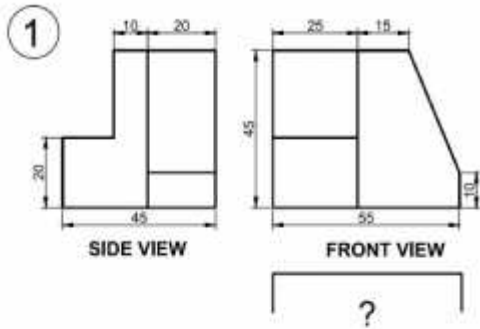
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|---|----|
| 1. Copy the given views | 1 |
| 2. Drawing the missing view with hidden lines | 2 |
| 3. Sketching the Isometric view without hidden edges | 5 |
| 4. To make the machine block of the above in three dimensions.
(Not to scale but approximately proportionately drawn with
Any medium i.e., Soap-cake, plasticine, clay, wax, floral foam brick
(available with florists), etc. | 7 |
| (ii) Computer Aided Design (CAD) – Project | 10 |
| Project file to be submitted on the simple solids or machine blocks as prescribed in part-I by using the CollabCAD software or any equivalent pertinent software. | |
| (iii) (a) Sessional work relating to machine blocks as prescribed. | 3 |
| (b) Viva-voce based on part-I and part-II | 2 |

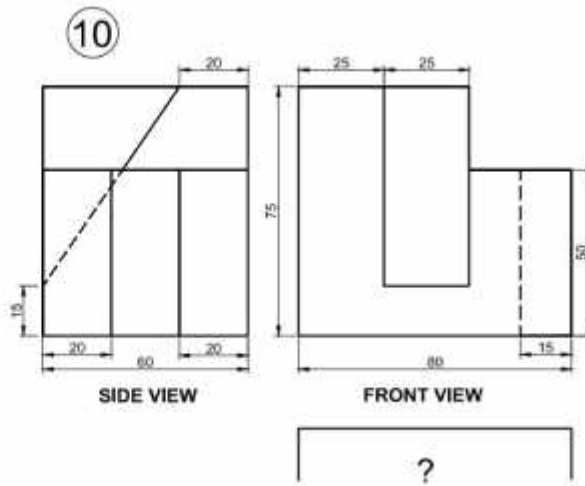
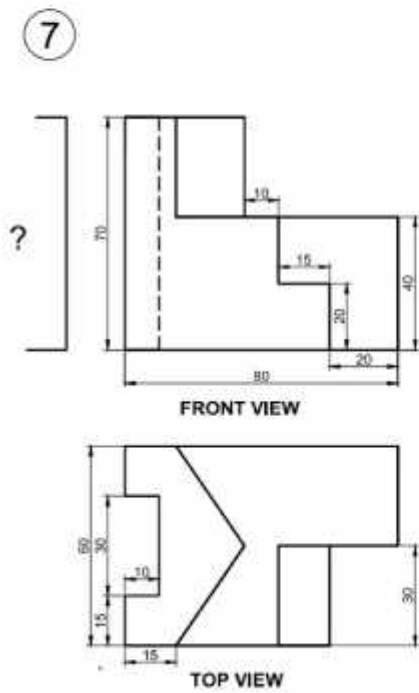
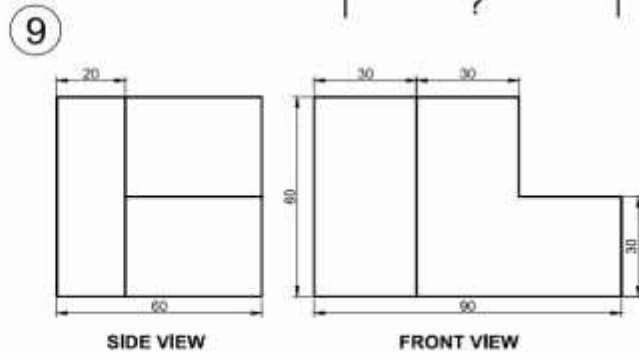
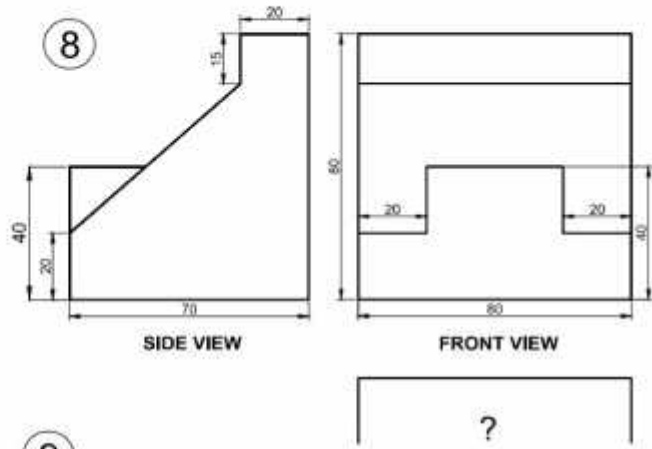
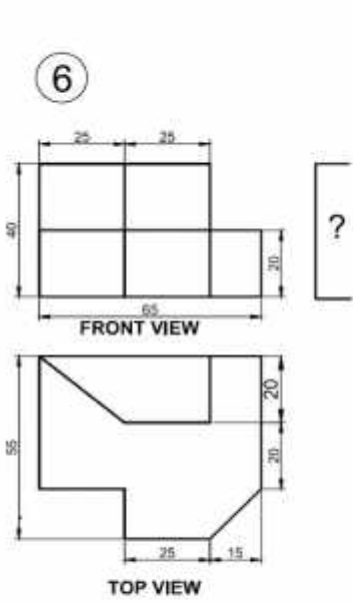
Total Marks 30

ACTIVITY

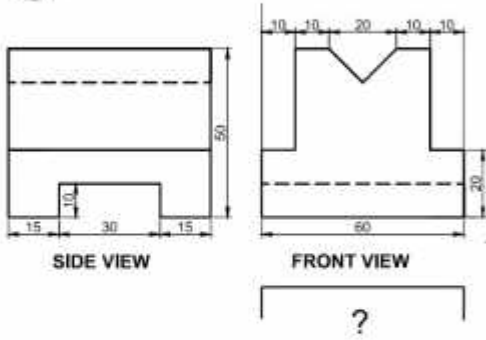
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ANNEXURE -- 1

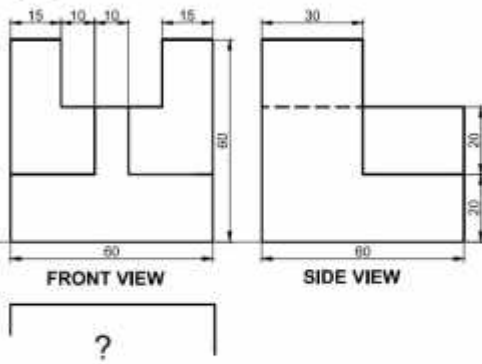




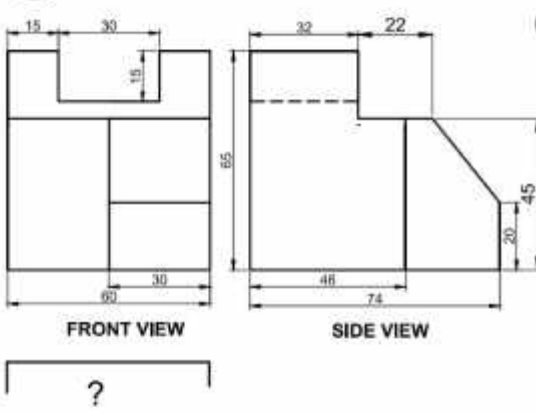
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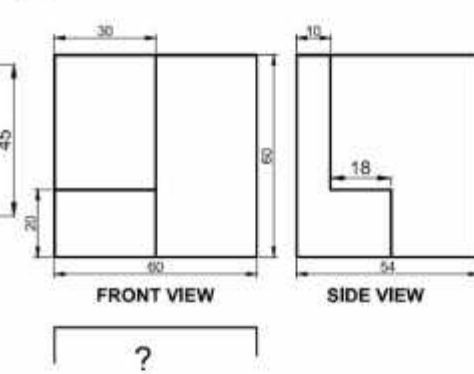
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