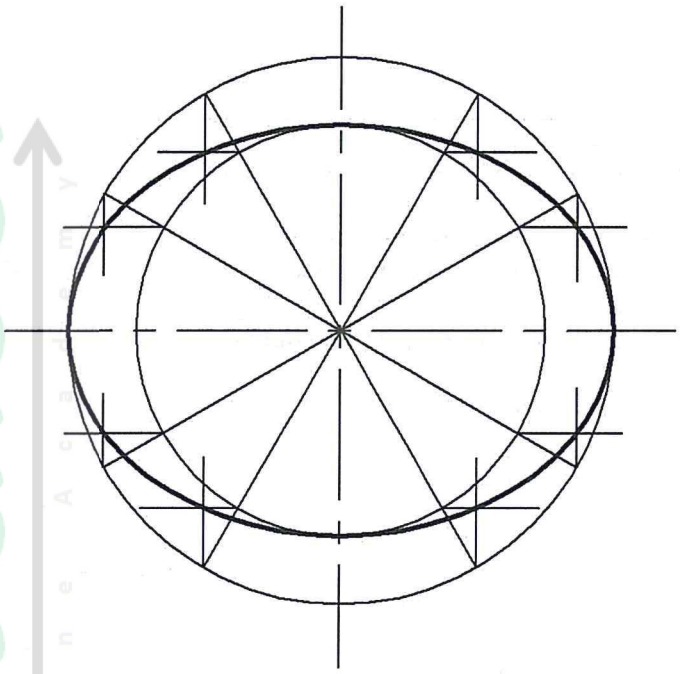
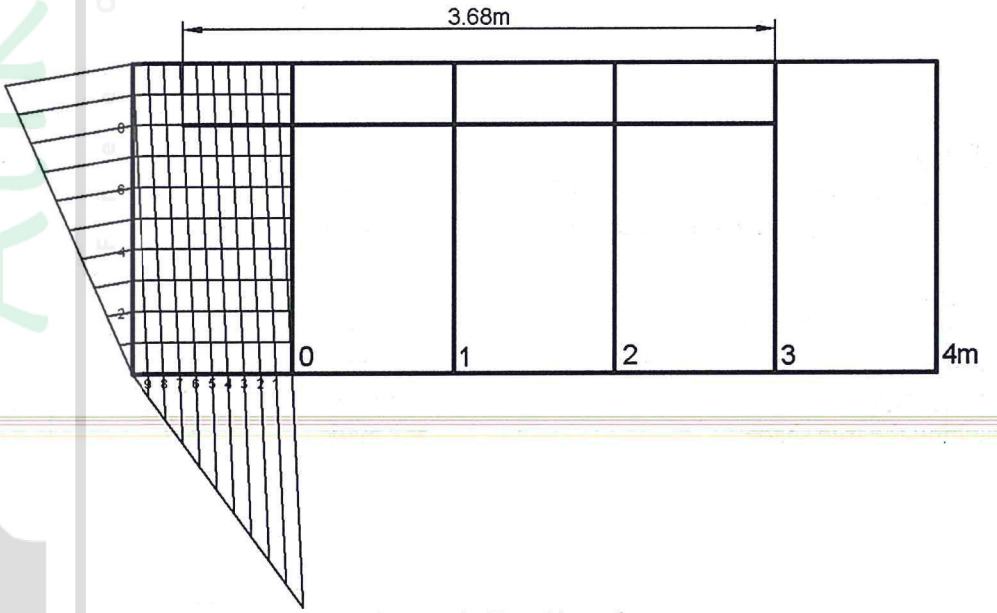
4.21 DRAWING AND DESIGN (449)

4.21.1 Drawing and Design Paper 1 (449/1)

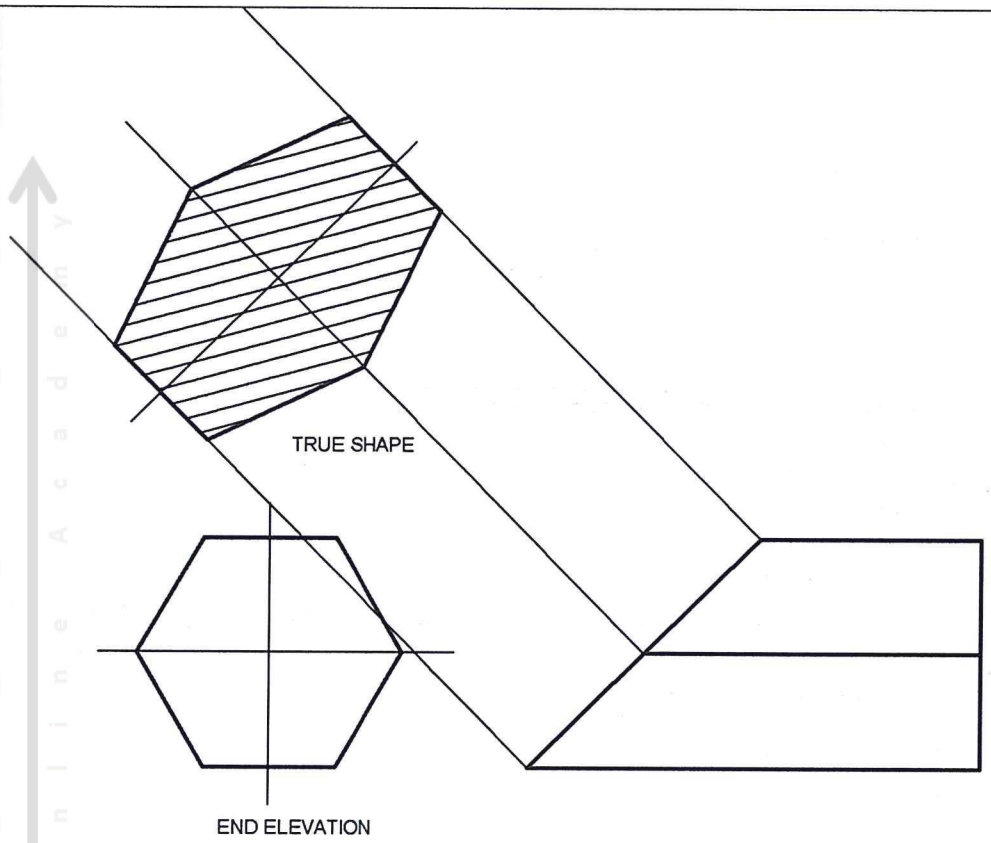
1. (a)	Technical drawing uses drawing instruments to produce conventional drawings of objects, while artistic drawings are drawn to the impression of the artist, without the use of conventions. Technical drawings are produced to scale using drawing instruments while artistic drawings show philosophical abstract ideas or emotions of the artist.	**(2 marks)**
(b)	**Career opportunities available after studying Drawing and Design:-** (i) Manufacturing industry. (ii) Draughtsmanship in designing buildings and structures. (iii) Construction industry. (iv) Aeronautical Engineering (v) Architecture (vi) Teaching in the technical institutions. **Accept any other correct response (Any 2 x 1= 2 mark)**	**(2 mark)**
2. (a)	**Reasons for using plastics in making set squares :-** (i) They are light in weight. (ii) Numbers and letters can easily be engraved on them clearly (iii) It can be shaped into various different shapes. (iv) They are durable (v) They do not rust even when subjected to moisture. **(Any 2 x ½= 1 mark)**	**(1 mark)**
(b)	**Reasons for using block boards in making drawing boards:-** (i) They are firm (cannot warp easily), strong & stable (ii) They can easily be worked on with hand tools to give the desired finish (iii) Have a smooth finish. (iv) They provide a larger surface area (v) They have no defects **(Any 2 x ½= 1 mark)**	**(1 mark)**
3. (a)	A salary is fixed payment made by an employer often monthly for professional or office work which is taxable, while a wage is payment made in return for work or services by workers at agreed time and is not taxable.	**(2 marks)**
(b)	A – Dimension line. B – Extension line/projection line. C – Hidden detail line. D – Centre line. **(Any 4 x ½= 2 mark)**	**(2 marks)**

4.	 Drawing circles Ø 80 and 60 mm – 1 mark Dividing the circle into 12 divisions – 1 mark Vertical lines from points on the bigger circle – 1 mark Drawing horizontal lines from points on the smaller circle – 1 mark Joining the points where lines meet – 1 mark **(5 x 1 = 5 marks**	**(5 marks)**
5. (a)	Ductility is the ability of a material to be drawn into thin wires without breaking i.e. being stretched cold without breaking malleability is the ability of a material to be hammered, bent shaped and rolled into various shapes without breaking i.e. Ability of a material to be rolled into thin sheets without breaking. **(2 x 1½= 3 marks)**	**(3 marks)**
(b)	(i) Linear measurements are obtained directly from flat surfaces where two points are joined by a straight line. (ii) Angular measurement is the degree of separation between two surfaces or lines from a common point. i.e It is the measurement of angles (iii) Scale is the ratio between the length of a line on the drawing and the actual size of the object. **(3 x 1 = 3 marks)**	**(3 marks)**

6. (a)	**Ways of communicating design ideas.** – Words/notes – Sketches – Working drawings – Exploded drawings – Models or mock-ups/prototypes – Pictures/photographs – Videos **(Any 4 x ½= 2 marks)**	**(2 marks)**
(b)	**Two components used for storing drawings in soft copy:-** (i) A flash disc (ii) A compact disc/magnetic tape (iii) A memory card (iv) Magnetic strip (v) CD or flash disk **(Any 2 x ½ = 1 marks)**	**(1 marks)**

7.	Representative Fraction (R.F.) = $\frac{25}{1000}$ Length of scale = R.F. x maximum length $= \frac{25}{1000} \times 5000 = 125mm$  – Correct R.F. = ½ mark – Correct length of scale = 1 mark – Drawing and marking 125mm = 1 mark – Dividing 125mm into 5 divisions = ½ mark – Dividing the first part into 10 divisions = ½ mark – Dividing the breadth into 10 divisions = ½ mark – Drawing the diagonals = 1 mark – Showing the distance of 3.68m = 1 mark	**(6 marks)**

8.



End – Elevation

- Drawing the circle whose diameter = A/F = 40mm = 1 mark
- Drawing the hexagon around the circle = 1 mark

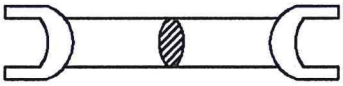
True shape

- Perpendicular projections = 1 mark
- Transfer of corner points from end elevation = 1 mark
- Joining the points = 1 mark
- Hatching the true shape = 1 mark

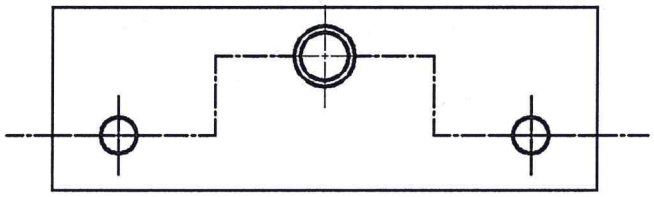
6 marks

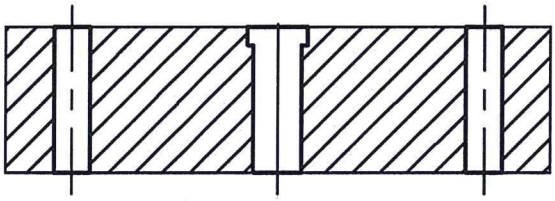
(6 marks)

9. (a)



Revolved section A-A





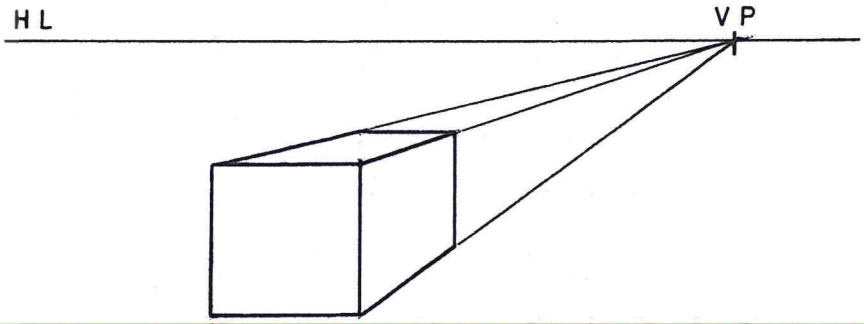
Staggered Section

(2×2=4 marks)

Accept any other correct alternative given.

(4 marks)

(b) (i)



Here there is one varnishing point. The horizontal lines on the cube are all parallel to the plane of projection.

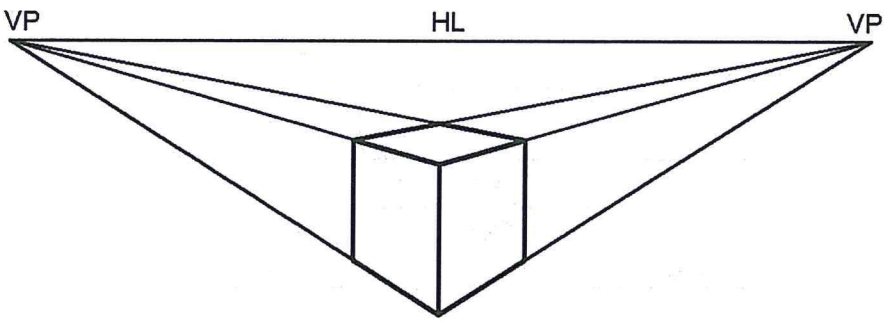
Sketch = 1 mark

Explanation = ½ mark

1½ marks

(1½ marks)

(ii)



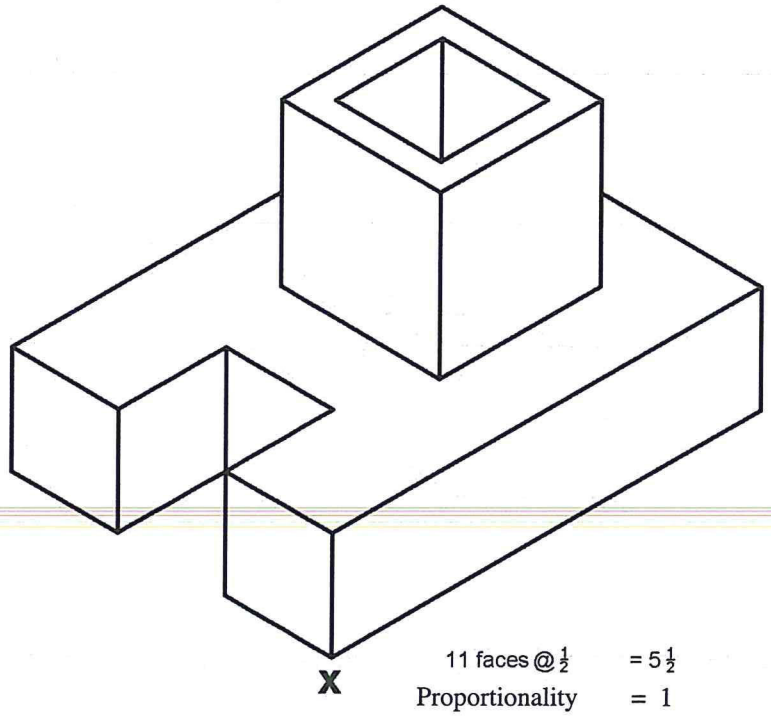
Two point perspective

Here there are two varnishing points. All horizontal lines converge towards the varnishing points.
Sketch = 1 mark
Explanation = ½ mark
1½ marks

(1½ marks)

Accept other alternatives if given with the HL and VP at different positions.

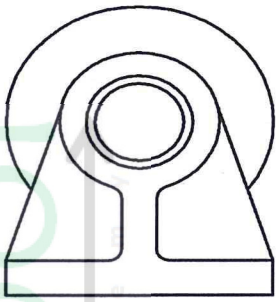
10.



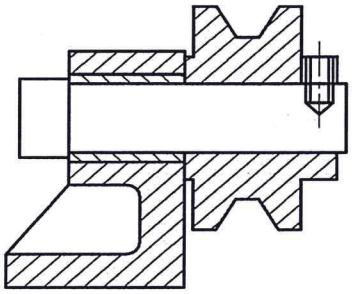
11 faces @ ½ = 5½
Proportionality = 1
Linework = ½
7 marks

(7 marks)

11.



END ELEVATION



SECTION X-X

End Elevation
- 6 faces @ 1 = 6

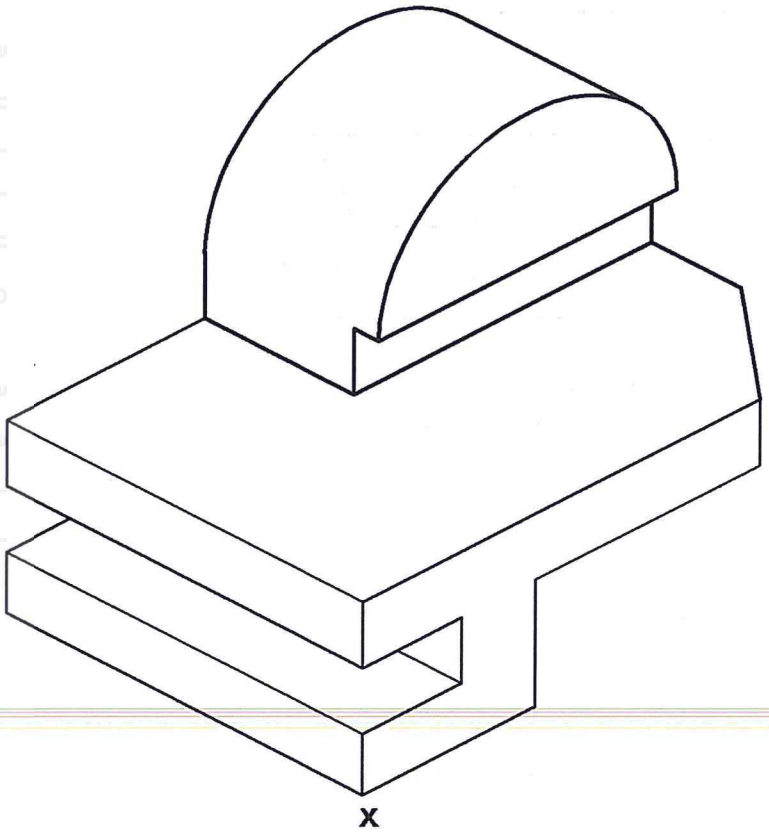
Section X-X
- 10 faces @ 1 =10
- 6 hatchings @ ½ =3
- Correct scale =1

20 marks

Accept solution the end elevation is drawn with a square head screw

20 marks

12.

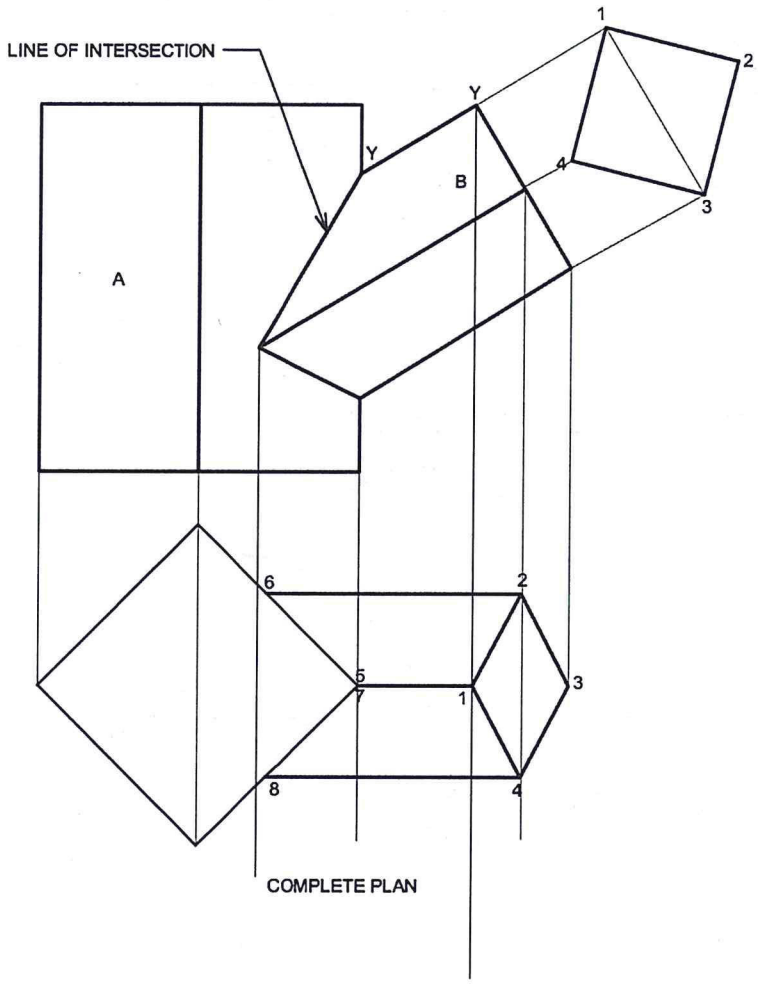


M/S

9 faces @ 1 = 9
2 curves @ 1½ = 3
Point x @ 1 = 1
✓Isometric @ 1 = 1
Linework/neatness = 1
15 marks

15 marks

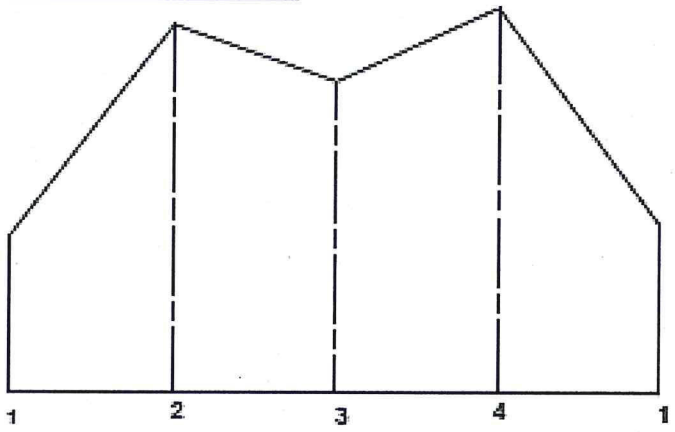
13.
(a)



(b)

(c)

DEVELOPMENT OF TUBE B



M/S
Transfer of the figure 2 x 1½ = 3

F/Elevation
Plotting the point of intersection = 1
Completing the lines of intersection = 2

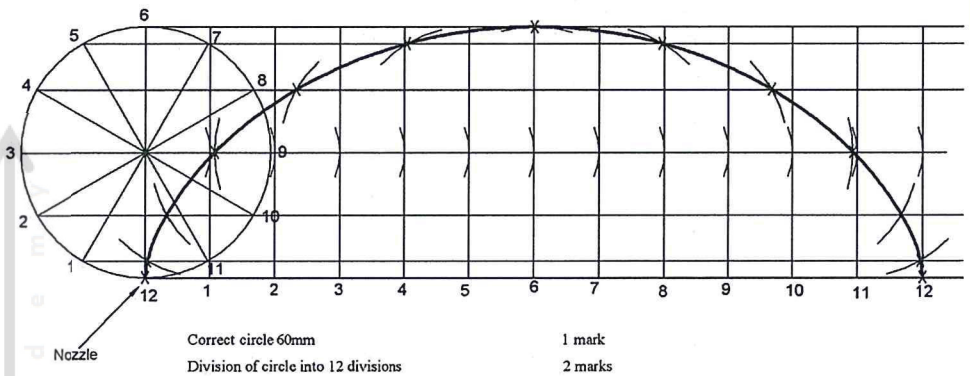
Plan
Projections from F/elevation = 2
Plotting the points = 1
Joining the points = 1

Development
Perimeter = 1
Transfer of height = 1
Drawing of curve = 1
Folding lines = 1
Linework/Neatness = 1
15 marks

(15 marks)

Accept the solution if the development is projected directly from tube B

14.



Correct circle 60mm	1 mark
Division of circle into 12 divisions	2 marks
Drawing horizontal lines from 12 points	2 marks
Drawing line = circumference	2 marks
Dividing the circumference into 12 divisions	2 marks
Drawing perpendicular lines from the circumference	2 marks
Marking points using radius of circle from 12 points	2 marks
Joining the points to get the locus	2 marks
Total	15 marks

M/S

- Correct circle Ø 60mm = 1 mark
- Division of circle into 12 divisions = 2 marks
- Drawing horizontal lines from 12 points = 2 marks
- Drawing line = circumference = 2 marks
- Dividing the circumference into 12 divisions = 2 marks
- Drawing perpendicular lines from the circumference = 2 marks
- Marking points using radius of circle from 12 points = 2 marks
- Joining the points to get the locus = 2 marks

15 marks

(15 marks)