Class: XII

ENGINEERING GRAPHICS (46)

Sample Question Paper 2020-21

General Instructions:

(i) Attempt all the questions.
(ii) Use both sides of the drawing sheet, if necessary.
(iii) All dimensions are in millimeters.
(iv) Missing and mismatching dimensions, if any, may be suitably assumed.
(v) Follow the SP:46-2003 revised codes (with first angle method of projection).
(vi) In no view of question2, are hidden edges or lines required.
(vii) In question 4, hidden edges or lines are to be shown in views without section.
(viii) Give your answers according to questions.

Time allowed: 3 Hours **Max. Marks: 70**

	Answer the following Multiple Choice questions. Print the correct choice on your drawing sheet.	***1×5=5***
1 (i)	Name the projection system used by artists and architects to show "one plane" drawings. (a) Oblique projection (b) Perspective projection. (c) Isometric projection (d) Orthographic projection	1
(ii)	Name the thread profile used on the neck of glass bottles etc. (a) Metric thread (b) BSW thread (c) Knuckle thread (d) Square thread	1
(iii)	The value of diameter of the collar in collar stud in terms of diameter 'd' is: (a) 1.5d (b) 1.5d+3 (c) 2d	1

	(d) 2d+6	
(iv)	Name the material of the bush in the bush-bearing. (a) Cast iron (b) Mild steel (c) High carbon steel (d) Gun metal	1
(v)	Cotter joint is used to connect two _____. (a) Square rods (b) Elliptical rods (c) Round rods (d) Hollow rods	1
2 (i)	Construct an isometric scale.	4
(ii)	Draw the isometric projection of a pentagonal prism (base edge 25 mm, axial length 55mm) resting on its face with its axis parallel to H.P. and V.P. both. Indicate the direction of viewing. Give all the dimensions.	8
(iii)	Draw an Isometric Projection of a hemisphere (diameter 60 mm) placed centrally on the top horizontal rectangular face of an equilateral triangular prism (base edge = 50 mm, height = 70 mm) keeping both triangular ends parallel to V.P. Show the axis of both solids. Give all the dimensions and indicate the direction of viewing.	12
3 (i)	Draw to scale 1:1, the standard profile of the **Square thread (External) taking** pitch 60mm. Give standard dimensions. **OR** Draw to scale 1:1, the Front View and Side View of a **Hexagonal headed bolt** with diameter 30mm. Keep its axis parallel to both V.P and H.P. Give standard dimensions.	8
(ii)	Sketch free hand the front View and top View of a **60° Counter Sunk Head Rivet** of diameter 20 mm. Keep its axis vertical. Give standard dimensions. .**OR** Sketch free hand the front view and side view of a **Square-neck Stud** of size M20, keeping its axis horizontal. Give	5

	standard dimensions.	
4	Figure1 shows the details of different parts of a '**Turnbuckle**'. Assemble these parts correctly and then draw the following views to scale 1:1, inserting 50mm threaded portion of each rod inside the body of Turnbuckle. (a) Front View, upper half in section. (b) Left side View. (c) Print the title and the scale used. Draw the projection symbol. Give 6 important dimensions.	 12 10 6

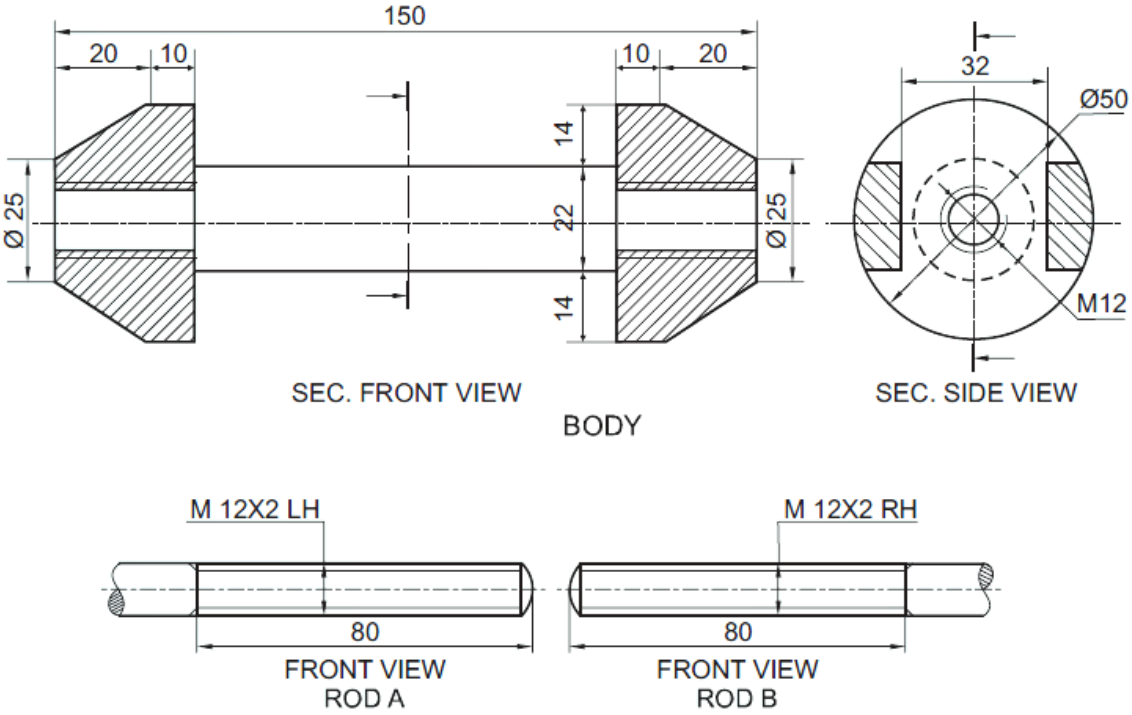


	Figure 1 **<u>OR</u>** Ffigure 2 shows the assembly of a '**Sleeve and Cotter Joint**'. Disassemble the parts correctly and then draw to its following views of the components to scale 1:1. Keep the position of components same with respect to H.P and V.P. both;	

	(a) SLEEVE (i) Sectional front view. (ii) Left side view. (b) COTTER B (i) Front view. (ii) Top view. (c) Print the title and the scale used. Draw the projection symbol. Give 6 important dimensions.	8 4 5 5 6

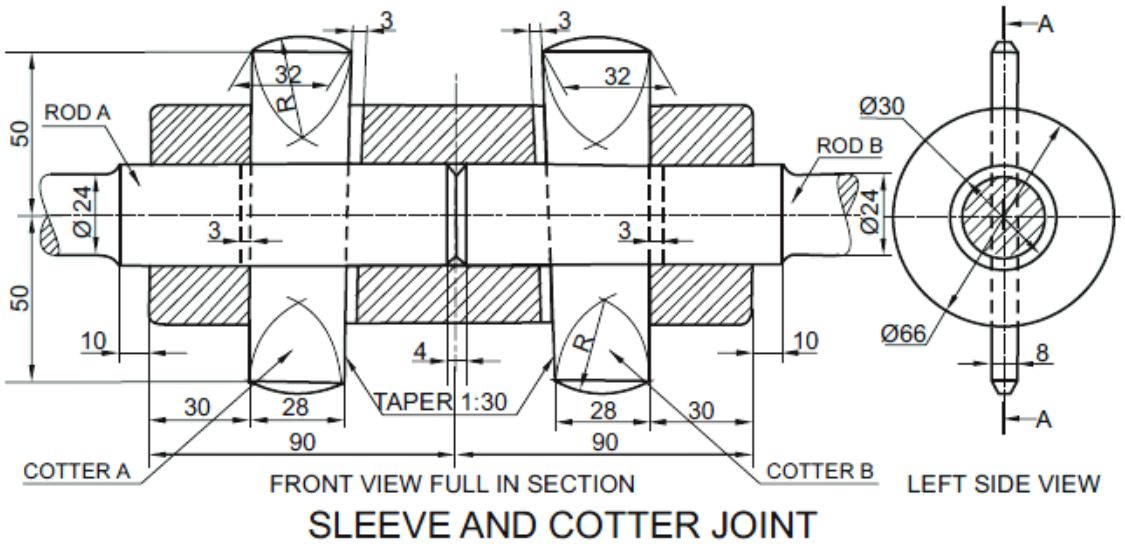


Figure 2

Class: XII

Session: 2020-21

ENGINEERING GRAPHICS(046)

Sample Question Paper (Theory)

Marking Scheme

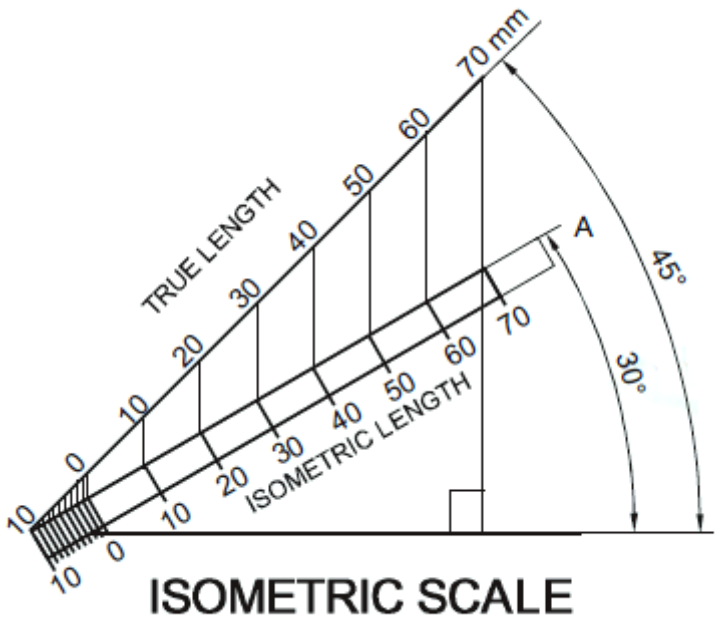
Time Allowed: 3 Hours **Maximum Marks: 70**

	Distribution of Marks		
1.	Answer the following Multiple-Choice questions. Print the correct choice on your drawing sheet.		**Marks**
	(i) (b)	Perspective projection.	*1*
	(ii) (c)	Knuckle thread	*1*
	(iii) (a)	1.5 d	*1*
	(iv) (d)	Gun Metal	*1*
	(v) (a)	Square rods	*1*
2. (i)	**ISOMETRIC SCALE**		**4**
		Marking of main divisions of 10 mm (at least seven divisions) with smaller divisions of 1 mm in first part, on true length.	*1½*
		Projections from scale 1:1 to get points on isometric scale, to get isometric length.	*1½*
		Printing 'True Length/Scale 1:1', 'Isometric Length/ Isometric Scale' and marking angles of 30 ^{o} & 45^{o}.	*1*
(ii)	**ISOMETRIC PROJECTION OF A PENTAGONAL PRISM**		**8**
		Drawing helping figure.	*1*
		Drawing both the isometric pentagons.	*3*
		Drawing the four face edges.	*2*
		Marking the axis (½) and direction of viewing (½).	*1*
		Dimensions.	*1*
(iii)	**ISOMETRIC PROJECTION OF A HEMISPHERE, PLACED CENTRALLY, ON THE TOP RECTANGULAR SURFACE OF A TRIANGULAR PRISM**		**12**
		<u>TRIANGULAR PRISM</u>	**6**
		Drawing helping figure.	*1*
		Drawing both the isometric triangles.	*2*
		Drawing the three horizontal edges.	*1½*
		Dimension and axis.	*1½*
		<u>HEMISPHERE</u>	**6**
		Drawing ellipse with centre lines.	*2½*
		Drawing curved surface.	*1½*
		Indicating the direction of viewing and axis.	*1*
		Dimensions.	*1*

3. (i)	**SQUARE THREAD PROFILE**		**8**
		Horizontal and vertical distances (equal to half of pitch), marked correctly.	*2*
		Drawing crests (1), roots (1) of threads (minimum two) and flanks (1), drawn correctly.	*3*
		Drawing hatching lines and conventional break.	*1*
		Standard dimensions.	*2*
		[OR]	
	HEXAGONAL HEADED BOLT		**8**
		Drawing head of the bolt.	*3*
		Drawing shank of the bolt with threaded portion.	*2*
		Drawing side view.	*1*
		Standard dimensions.	*2*
(ii)	**60^0 CSK HEAD RIVET**		**5**
		Front view with vertical axis.	*$2^1/_2$*
		Top view.	*$1^1/_2$*
		Standard dimensions.	*1*
		[OR]	
	STUD WITH SQUARE NECK		**5**
		Front view with horizontal axis.	*$2^1/_2$*
		Side view.	*$1^1/_2$*
		Standard dimensions.	*1*
4.	**TURNBUCKLE (Assembly)**		
	(a)	FRONT VIEW UPPER HALF IN SECTION:	**15**
		Drawing the upper half of body (4) with hatching lines (1).	*5*
		Drawing the lower half of body.	*4*
		Drawing both the rods with 50 mm insertion in the body and conventional ends.	*6*
	(b)	SIDE VIEW:	**7**
		Drawing two circles of body.	*2*
		Drawing conventional end of rod with threading.	*$2^1/_2$*
		Drawing both supporting plates at a distance of 32 mm.	*2*
		Drawing cutting plane.	*$^1/_2$*
	DETAILS :		**6**
		Printing title.	*1*
		Scale used.	*1*
		Projection symbol.	*1*

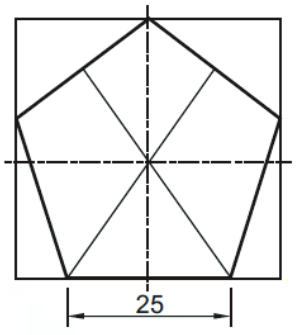
		Six important dimensions.	*3*
		[OR]	
	SLEEVE AND COTTER JOINT (Dis assembly)		
	(i) **SLEEVE**		
	(a)	SECTIONAL FRONT VIEW :	**8**
		Drawing the boundary of sleeve with internal hole of dia 30mm.	*4*
		Drawing cotter holes.	*2*
		Hatching lines	*2*
	(b)	LEFT SIDE VIEW :	**4**
		Drawing both circles.	*2*
		Drawing hidden lines of cotter.	*1*
		Cutting plane.	*1*
	(ii) **COTTER B**		
	(a)	FRONT VIEW:	**5**
		Drawing cotter with taper on one side.	*3*
		Drawing curves on both ends.	*2*
	(b)	TOP VIEW :	**5**
		Drawing boundary of cotter with hidden line.	*3*
		Drawing both curves.	*2*
	DETAILS :		**6**
		Printing titles.	*1*
		Scale used.	*1*
		Projection symbol.	*1*
		Six important dimensions.	*3*

2(a)

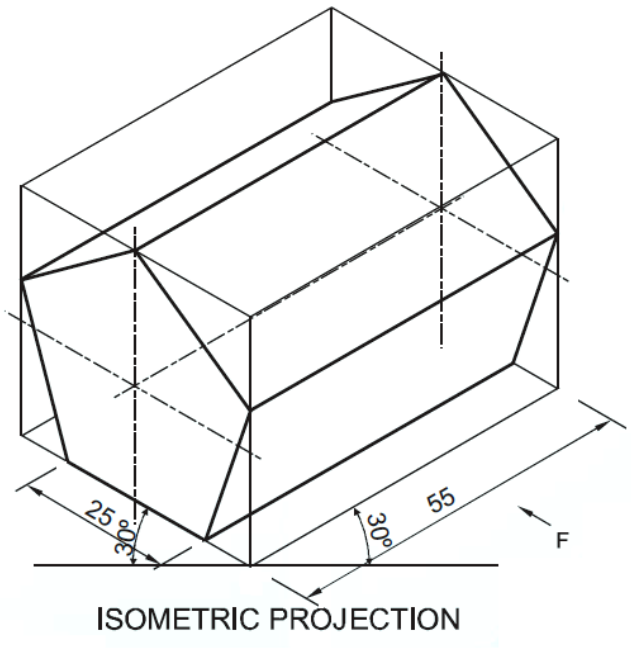


ISOMETRIC SCALE

2(b)

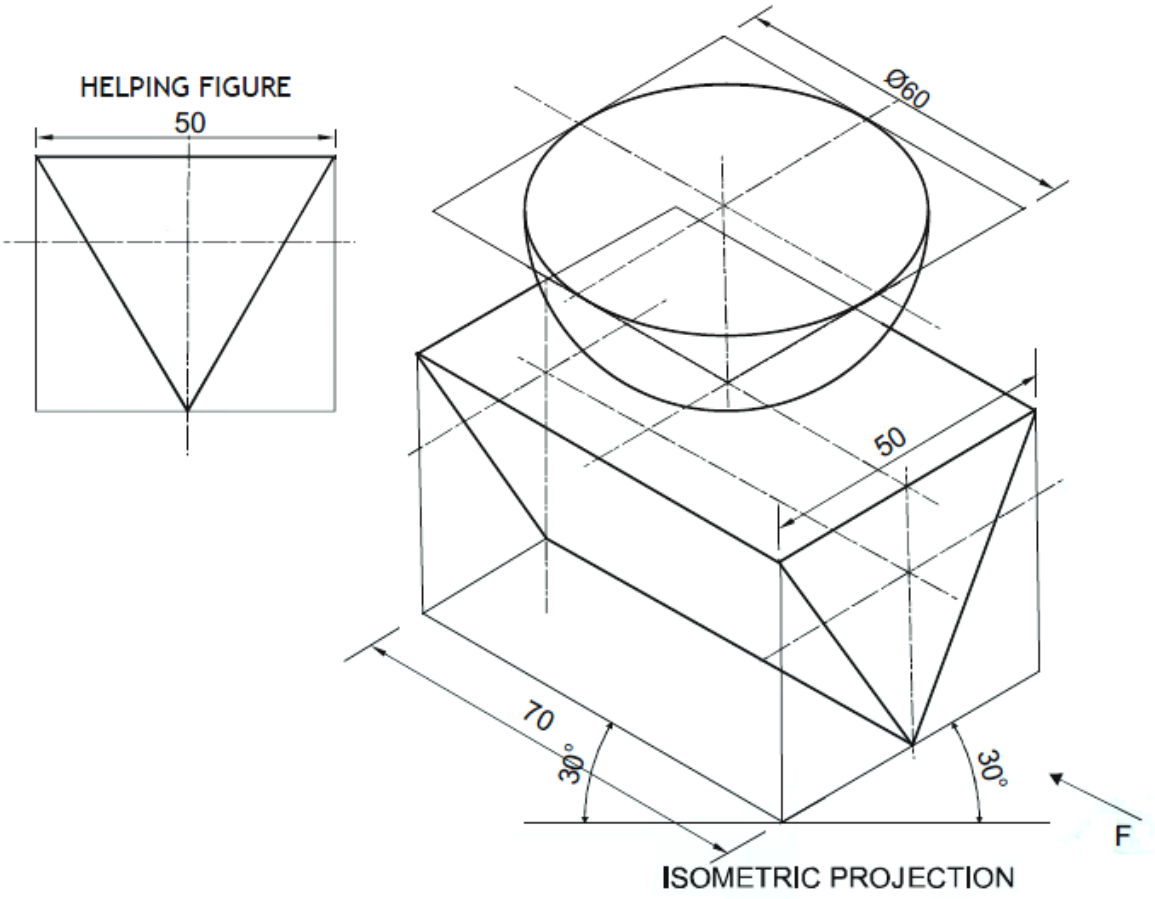


HELPING FIGURE

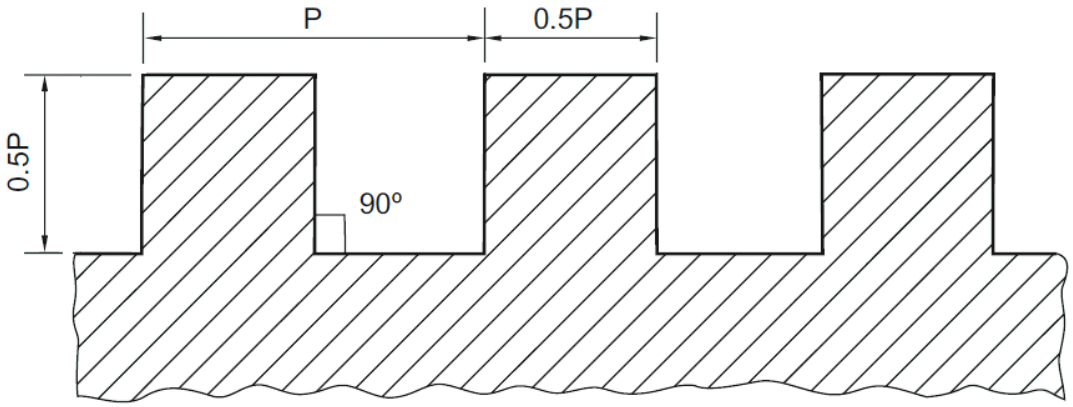


ISOMETRIC PROJECTION

2(c)



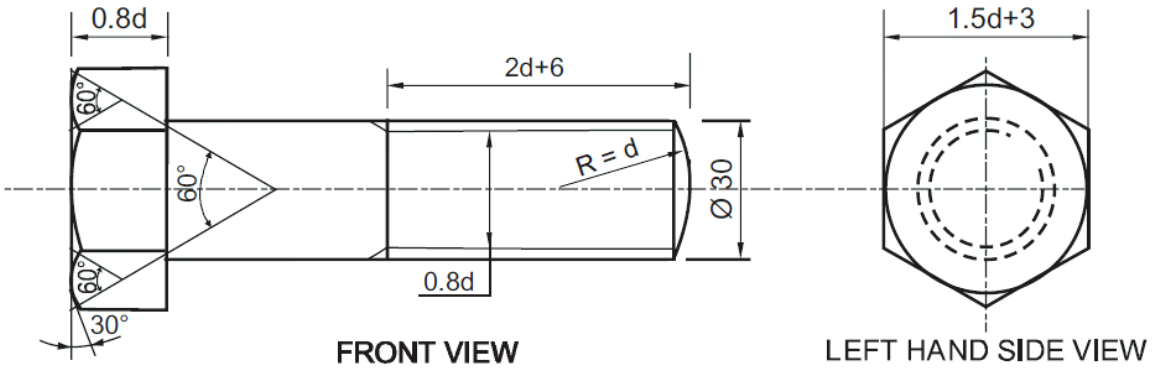
3(a)



P	0.5P	ANGLE
60	30	90°

SQUARE THREAD PROFILE

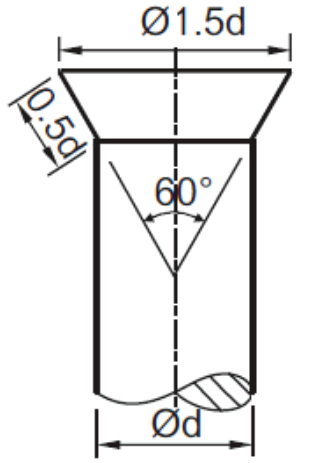
OR



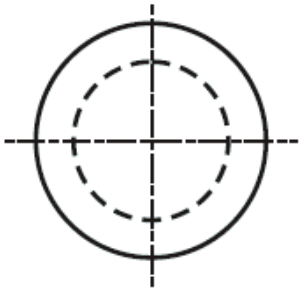
Ø d = 30mm

HEXAGONAL BOLT

3 (b).



FRONT VIEW

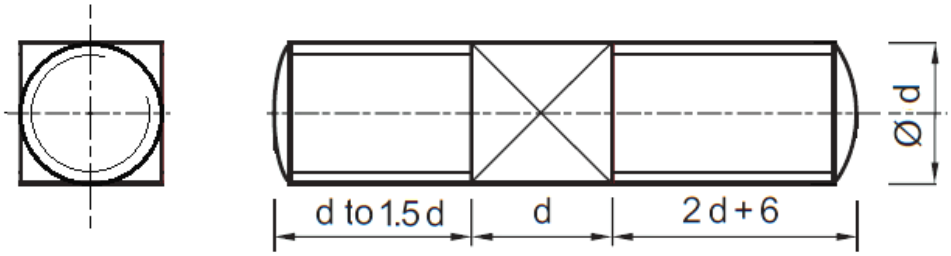


TOP VIEW

60^0 CSK HEAD RIVET

d	20
0.5d	10
1.5d	30

OR



SIDE VIEW FRONT VIEW d =20mm

STUD WITH SQUARE NECK

4.

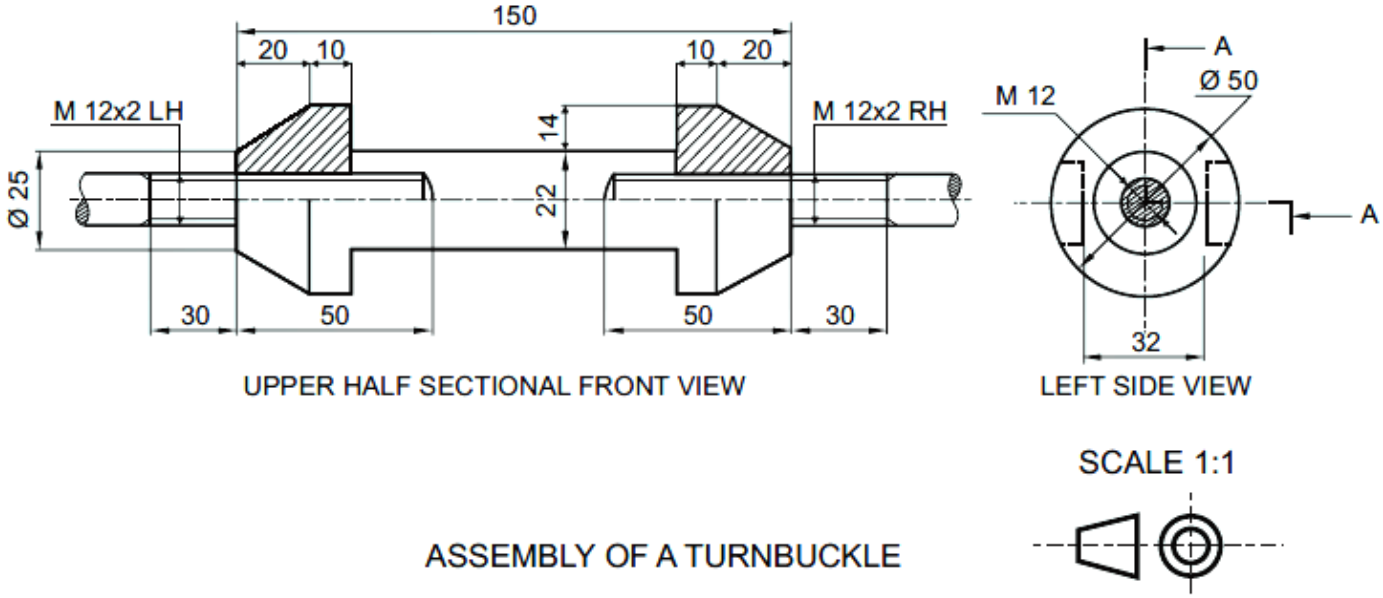
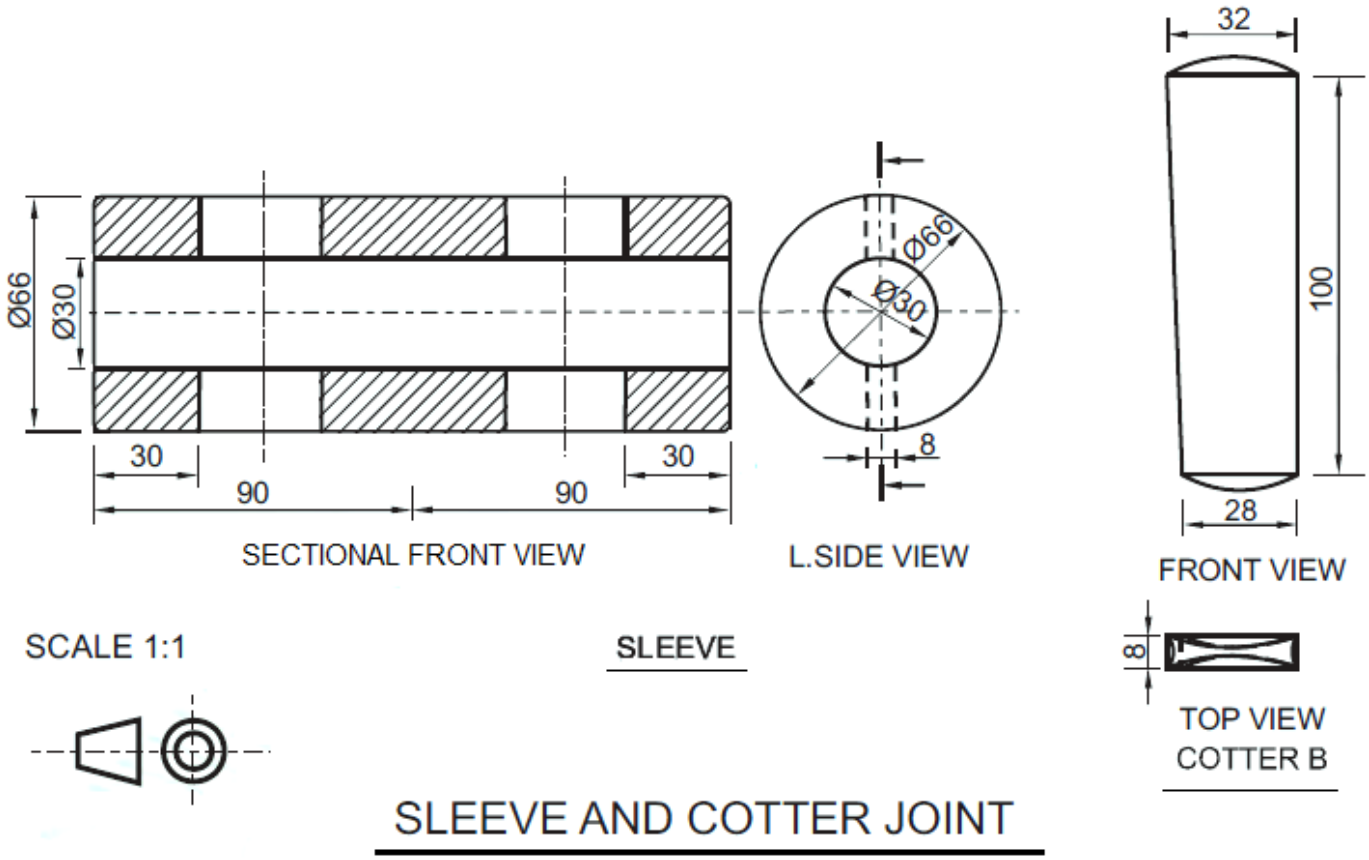

150
20
10
10
20
M 12x2 LH
M 12x2 RH
14
22
Ø 25
30
50
50
30
UPPER HALF SECTIONAL FRONT VIEW
A
Ø 50
M 12
A
32
LEFT SIDE VIEW
SCALE 1:1
ASSEMBLY OF A TURNBUCKLE

Figure 1

OR



SLEEVE AND COTTER JOINT

Figure 2