

**SAMPLE QUESTION PAPER**  
**XII – (2022-23)**  
**ENGINEERING GRAPHICS (046)**

*Time Allowed: 3 hours*

*Maximum Marks: 70*

Note:

- (i) Attempt all the questions.
- (ii) Use both sides of the drawing sheet, if necessary.
- (iii) All dimensions are in millimetres.
- (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 question 21, are hidden edges or lines required.
- (vii) In question 23, hidden edges or lines are to be shown in views without section.

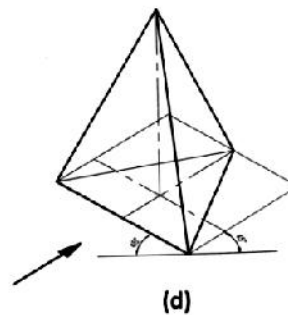
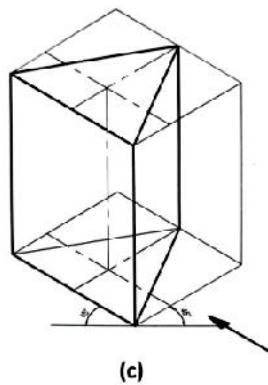
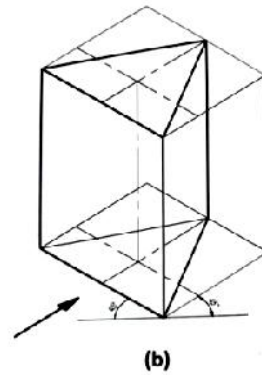
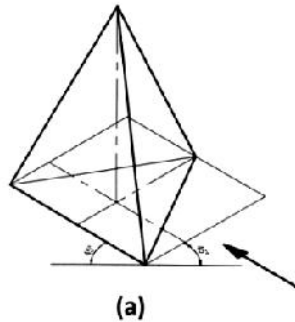
**SECTION – A**

*Q 1 to Q 8 – Answer the following multiple choice questions. Print the correct choice on your drawing sheet:*

1. Which one among the following methods cannot produce 'One plane/pictorial' drawings?
  - a) Isometric Projection
  - b) Perspective Projection
  - c) Oblique Projection
  - d) Orthographic Projection
2. \_\_\_\_\_ resembles an inverted solid.
  - a) A cone filled with ice-cream
  - b) A glass prism
  - c) Pyramid of Giza
  - d) A cylindrical glass tumbler



3. Which figure among the following correctly represents a triangular prism whose axis is perpendicular to H.P and one of its base edges is parallel to V.P.?

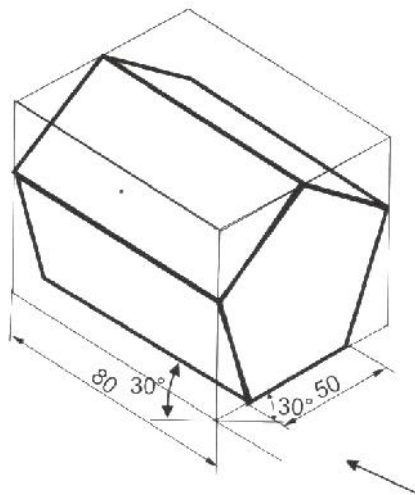


4. A gasket in Flange Pipe Joint is provided to
- align the two flanges.
  - check leakage of fluid in pipes.
  - support the nuts and bolts.
  - fill the gap between the flanges.
5. The joint used for tightening of electric overhead wires is
- Spigot and Socket Joint
  - Turn Buckle / Tie Rod Joint
  - Gib and Cotter Joint
  - Knuckle Joint

6. CRS in Open Bearing stands for
  - a) Centre to centre distance
  - b) Edge to edge distance
  - c) Corner to corner distance
  - d) Top to bottom distance
7. P.C.D. in flange pipe joint means
  - a) Pitch corner diameter
  - b) Pitch counter distance
  - c) Pitch centre distance
  - d) Pitch circle diameter
8. Usually taper in cotter is given as
  - a) 1 in 10
  - b) 1 in 20
  - c) 1 in 30
  - d) 1 in 40

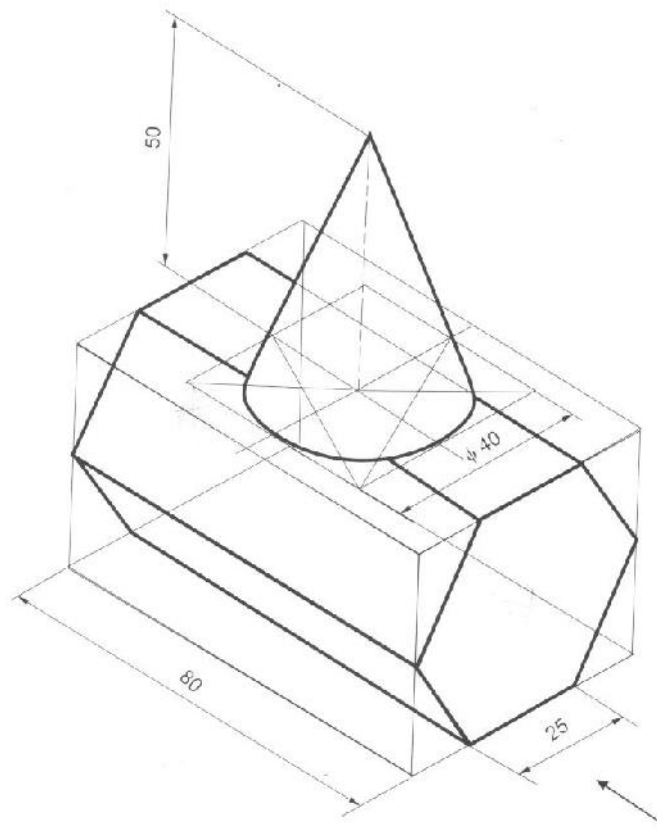
*Q 9 to Q 14 – Select the correct option corresponding to the orientation of the given Isometric Projection:*

9.



- a) The hexagonal ends are parallel to VP
- b) The pentagonal ends are parallel to VP
- c) The hexagonal ends are perpendicular to VP
- d) The pentagonal ends are perpendicular to VP

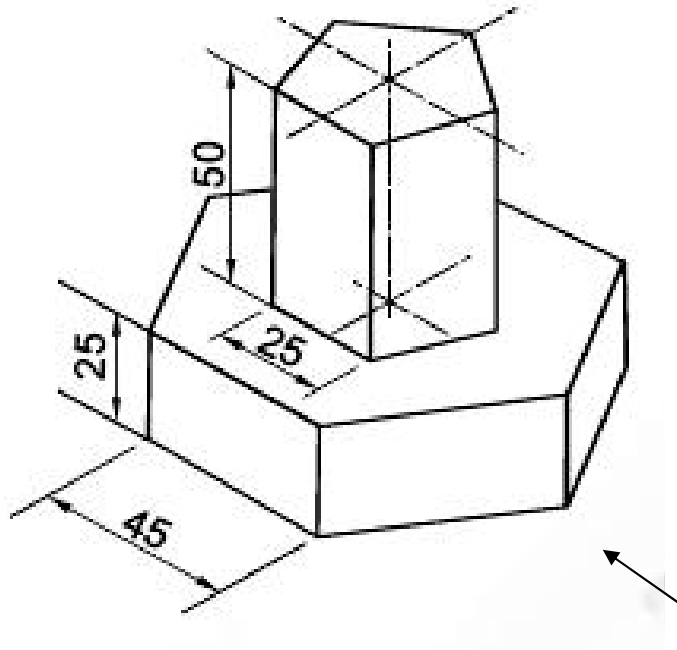
10.



- a) Axis of cone is perpendicular to HP, axis of prism is parallel to VP
- b) Axis of cone is perpendicular to VP, axis of prism is parallel to HP
- c) Axis of cone is perpendicular to HP, axis of prism is perpendicular to VP
- d) Axis of cone is parallel to VP, axis of prism is perpendicular to HP



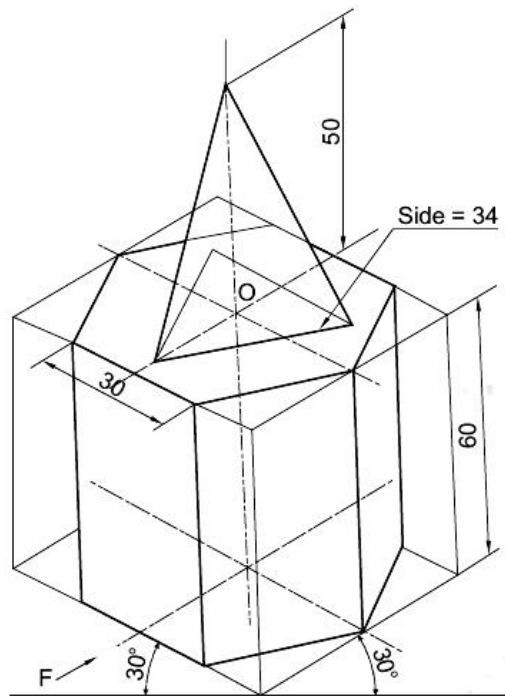
11.



- a) A pentagonal prism is resting on top of pentagonal disc. Axis of prism is parallel to VP and that of disc is perpendicular to VP.
- b) A hexagonal prism is resting on top of hexagonal disc. Axis of prism is perpendicular to HP and that of disc is parallel to VP.
- c) A hexagonal prism is resting on top of pentagonal disc. Axis of prism is parallel to VP and that of disc is perpendicular to HP.
- d) A pentagonal prism is resting on top of hexagonal disc. Axis of prism is parallel to VP and that of disc is perpendicular to HP.

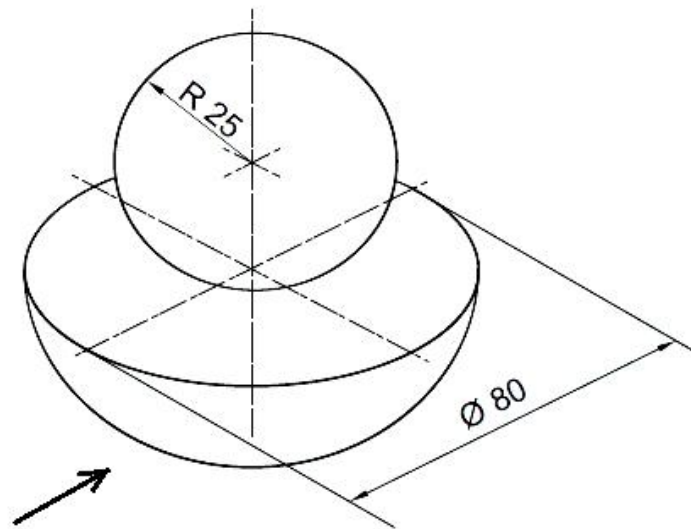


12.



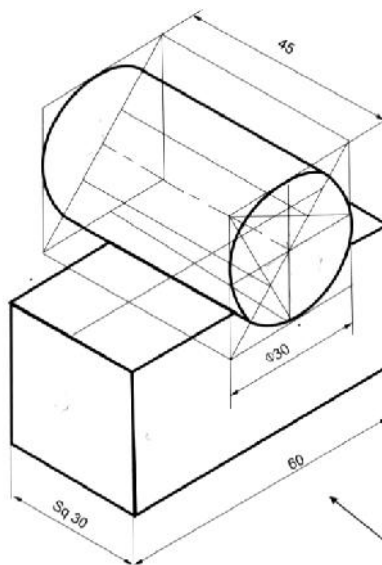
- a) Two vertical prisms where one of the base edges of the prism at the rear is perpendicular to HP
- b) Two vertical pyramids with one base edge of the pyramid is parallel to VP and nearer to it
- c) Two vertical solids with one base edge of the pyramid away from observer and parallel to VP
- d) Two horizontal solids with one base edge of the prism parallel to VP and nearer to it

13.



- a) The length of common axis is true 65mm
- b) The length of common axis is iso 65mm
- c) The length of common axis is more than iso 65mm
- d) The length of common axis is less than iso 65mm

14.



- a) A horizontal solid placed on a vertical solid
- b) A horizontal solid placed on a horizontal solid
- c) A vertical solid placed on a horizontal solid
- d) A vertical solid placed on a vertical solid



*Q15 – Two statements are given – one labelled assertion (A) and the other labelled reason (R). Select the correct answer to the following question from the codes (a), (b), (c) and (d) as given below:*

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true and R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false and R is also false.

15. **A:** 'Four centre method' is used while drawing isometric view of a hemisphere.

**R:** The iso projection of its circular face is a sphere.

*Q16 to Q 20 – Answer Read the following para and answer the following questions.*

Two friends who are the students of class XII Engg. Graphics had to fix the problems in their bike during the summer vacation. While purchasing the spare parts at a machinery shop, they observed a machine part similar to bolt. They sent the following image of that machine part to their Engg. Graphics teacher. Then the teacher explained everything about that part, which is called as stud.



16. Which category does the stud belong to?

- a) Permanent fastener
- b) Permanent bearing
- c) Temporary fastener
- d) Temporary bearing





17. Stud is a
- Headless bolt
  - Headless key
  - Square headed bolt
  - Hexagonal headed bolt
18. Name the shape of the central portion of the above figure
- Collar
  - Web
  - Cover
  - Rod
19. What is the outer diameter of the central portion of the above figure, when 'd' is the diameter of stud?
- 0.8 d
  - d
  - 1.1 d
  - 1.5 d
20. What is the length of the metal end of a stud with 20mm diameter?
- 46mm
  - 43mm
  - 20mm
  - 16mm

### **SECTION – B**

21. (a) Construct an isometric scale. 5
- (b) 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. 10
22. Draw to scale 1:1, the standard profile of the **Metric thread profile (Internal)** with the pitch = 50mm. Give standard dimensions. 8



**OR**

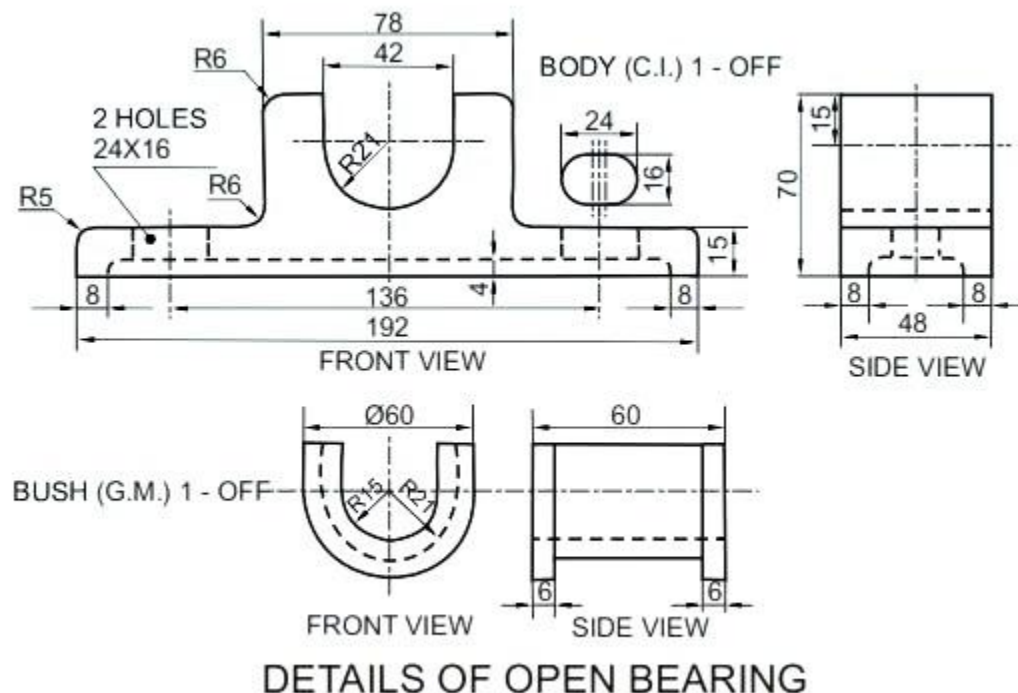
Draw to scale 1:1, the front view and top view of a square headed nut across flat, the diameter is given as 25 mm. The axis of the nut is vertical. Give the standard dimensions. 8

23. Figure 1 shows the details parts of an Open Bearing. Assemble all the parts correctly and then draw to scale 1:1; it's following views:

(a) Front View, right half in section 13

(b) Top View 8

Print the title and scale used. Draw projection symbol. Give 6 important dimensions. 6



**Figure 1**

**OR**

Figure 2 shows the assembly of a 'Gib and Cotter Joint'. Disassemble the parts correctly and then draw to scale 1:1 its following views of the following components. Keeping the same position with respect to H.P and V.P. as given:



- 
- The drawing shows a mechanical part with the following dimensions and features:
- FRONT VIEW:**
    - Overall width: 30
    - Overall height: 140
    - Top horizontal section: 30 wide, 15 high.
    - Central horizontal section: 30 wide, 36 high.
    - Bottom horizontal section: 20 wide, 15 high.
    - Vertical section: 25 wide, 12 high.
    - Overall length: 148
    - Radius: R6
    - Surface texture: 3
    - Taper: 1:30
  - SIDE VIEW:**
    - Overall width: 9
    - Overall height: 140
    - Central horizontal section: 60 wide, 36 high.

## Figure 2

**SAMPLE QUESTION PAPER**  
**MARKING SCHEME**  
**XII – (2022-23)**  
**ENGINEERING GRAPHICS (046)**

*Time Allowed: 3 hours*

*Maximum Marks: 70*

**SECTION – A**

**Value Points**

- |  |   |
|--|---|
| 1. d) Orthographic Projection  | 1 |
| 2. a) A cone filled with ice-cream   | 1 |
| 3. b)  | 1 |
| 4. b) check leakage of fluid in pipes  | 1 |
| 5. b) Turn Buckle / Tie Rod Joint  | 1 |
| 6. a) Centre to centre distance  | 1 |
| 7. d) Pitch circle diameter  | 1 |
| 8. c) 1 in 30  | 1 |
| 9. b) The pentagonal ends are parallel to VP   | 1 |
| 10. c) Axis of cone is perpendicular to HP, axis of prism is perpendicular to VP   | 1 |
| 11. d) A pentagonal prism is resting on top of hexagonal disc. Axis of prism is parallel to VP and that of disc is perpendicular to HP | 1 |
| 12. c) Two vertical solids with one base edge of the pyramid away from observer and parallel to VP                                     | 1 |
| 13. b) The length of common axis is 65mm   | 1 |
| 14. b) A horizontal solid placed on a horizontal solid   | 1 |
| 15. c) A is true but R is false  | 1 |
| 16. c) Temporary Fastener  | 1 |
| 17. a) Headless Bolt   | 1 |
| 18. a) Collar  | 1 |
| 19. d) 1.5 d   | 1 |
| 20. c) 20mm  | 1 |



## **SECTION – B**

21. (a) ISOMETRIC SCALE	<b>5</b>
(i) Drawing 45° inclined line showing true lengths	1
(ii) Projections on 30° inclined line showing isometric length with 1mm subdivisions in one part	3
(iii) Writing titles, sub titles and angles	1
21. (b) ISOMETRIC PROJECTION OF PENTAGONAL PRISM	<b>10</b>
(i) Helping figure	1
(ii) Drawing both the iso-pentagons	4
(iii) Drawing four face edges	3
(iv) Dimensions	1
(v) Indicating the axis and direction of viewing	1
22. METRIC THREAD (INTERNAL)	<b>8</b>
(i) Distance equal to pitch, and angles of 60°	2
(ii) Flat edges and curves for threads	2
(iii) Side edges / flanks	2
(iv) Dimensions	2

**OR**

HEXAGONAL NUT	<b>8</b>
(i) Drawing front view with details	3
(ii) Drawing top view with details	3
(iii) Dimensions and titles	2



## 23. ASSEMBLY OF OPEN BEARING

<b>(a) FRONT VIEW RIGHT HALF IN SECTION</b>	<b>13</b>
(i) Drawing right half body with hole	4
(ii) Drawing left half body	$2\frac{1}{2}$
(iii) Hatching in body	1
(iv) Drawing right half bush	$1\frac{1}{2}$
(v) Drawing left half bush.	3
(vi) Hatching in bush	1
<b>(b) TOP VIEW</b>	<b>8</b>
(i) Drawing outline of body with two vertical lines	2
(ii) Drawing two holes with center lines	2
(iii) Drawing bush	2
(iv) Hidden lines	$1\frac{1}{2}$
(v) Cutting plane	$\frac{1}{2}$
<b>(c) OTHERS</b>	<b>6</b>
(i) Important Dimensions	3
(ii) Printing title, Projection symbol and Scale used	3

OR

## DIS-ASSEMBLY OF GIB AND COTTER JOINT

<b>(a) FORK END</b>	
(i) FRONT VIEW UPPER HALF IN SECTION	<b>9</b>
a. Drawing body with conventional end	6
b. Drawing hole (2) and hatching in upper half	3
(ii) Top View.	<b>6</b>
a. Drawing body with two vertical lines	4
b. Drawing hole	2



**(b) GIB**

(i) Front View 4

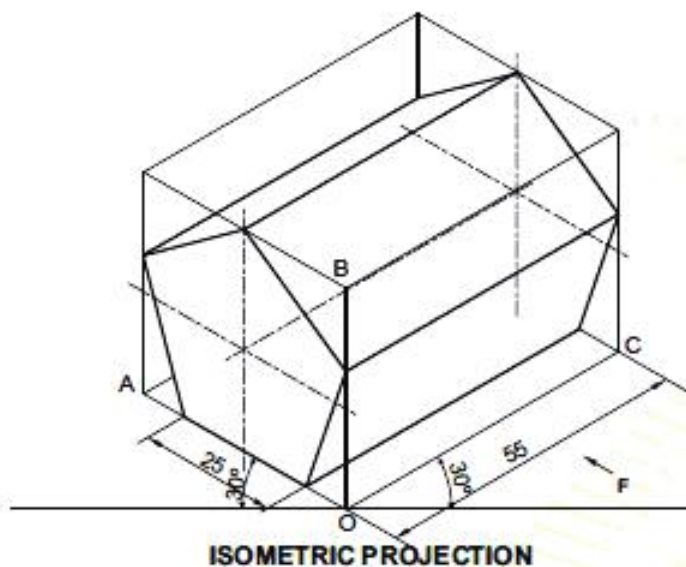
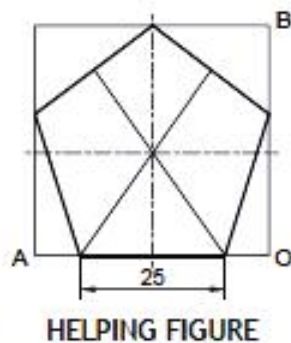
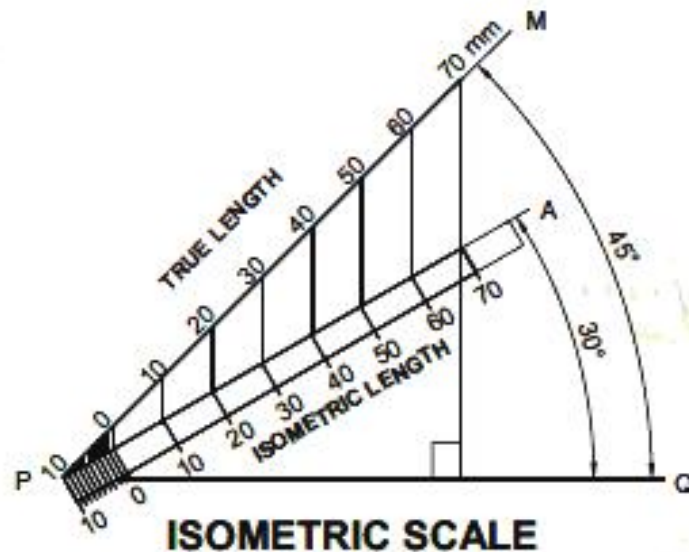
a. Drawing body (2) and taper (2) 4

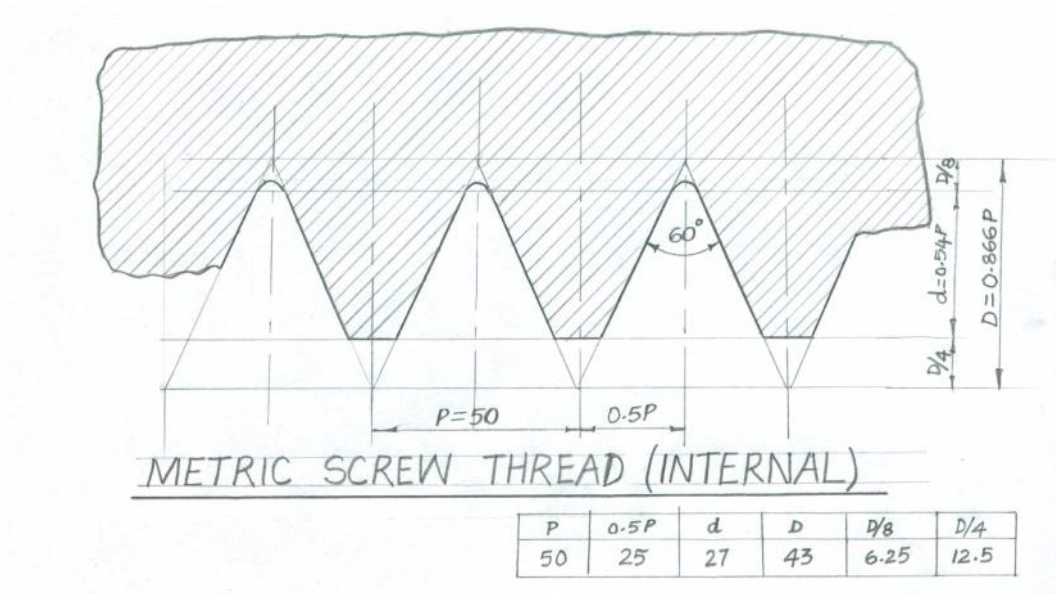
(ii) Side View 2

**(c) OTHERS 6**

(i) Important Dimensions. 3

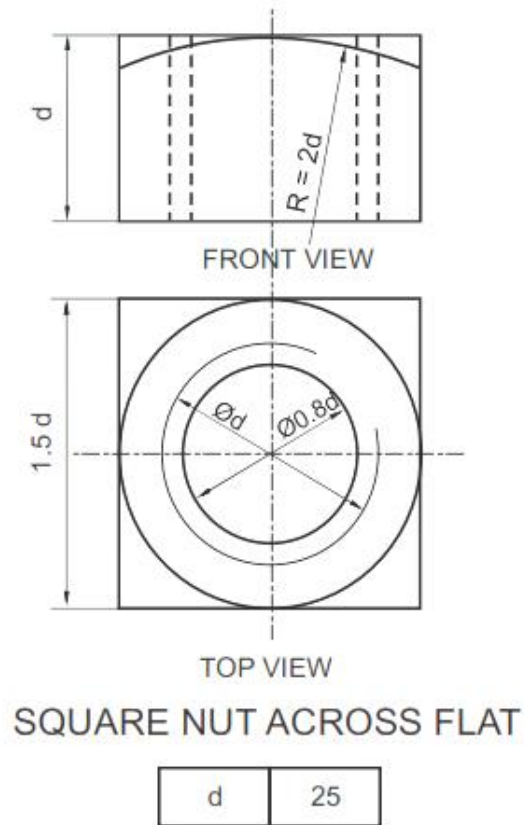
(ii) Titles, Symbol of Projection and Scale used. 3



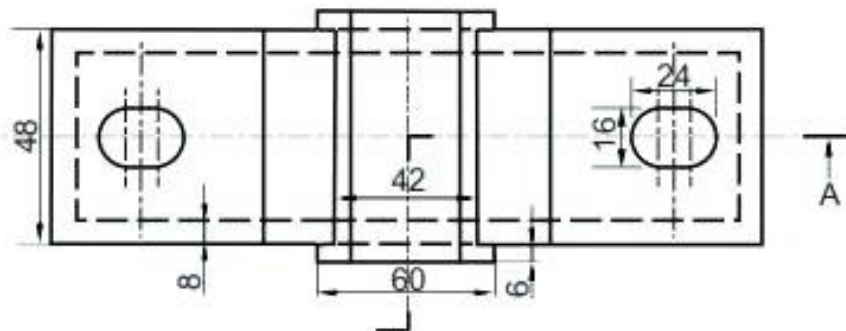
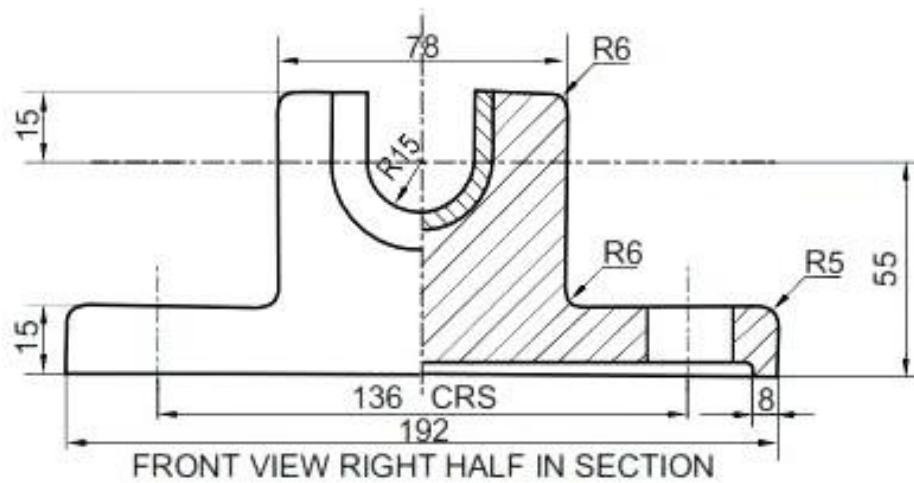


**FIG – 1.4**

**OR**

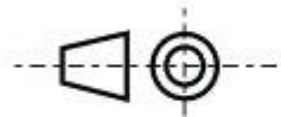


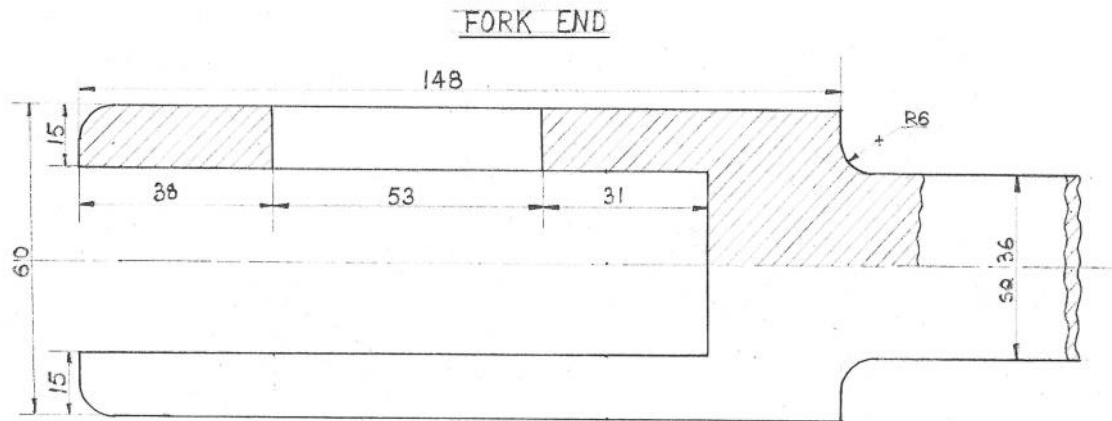




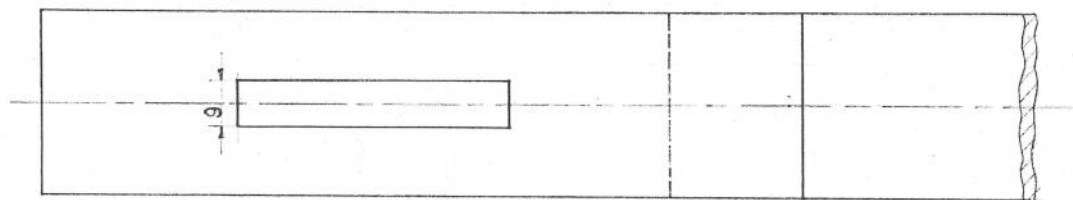
OPEN BEARING

SCALE 1:1





UPPER HALF SECTIONAL FRONT VIEW



TOP VIEW

