

Class: XII

Session: 2020-21

**ENGINEERING GRAPHICS(046)**

**Sample Question Paper (Theory)**

**Marking Scheme**

**Time Allowed: 3 Hours**

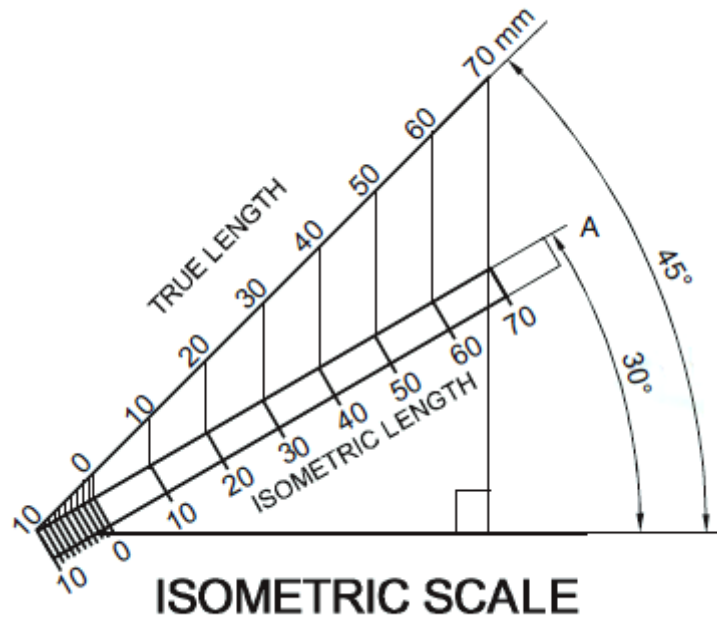
**Maximum Marks: 70**

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

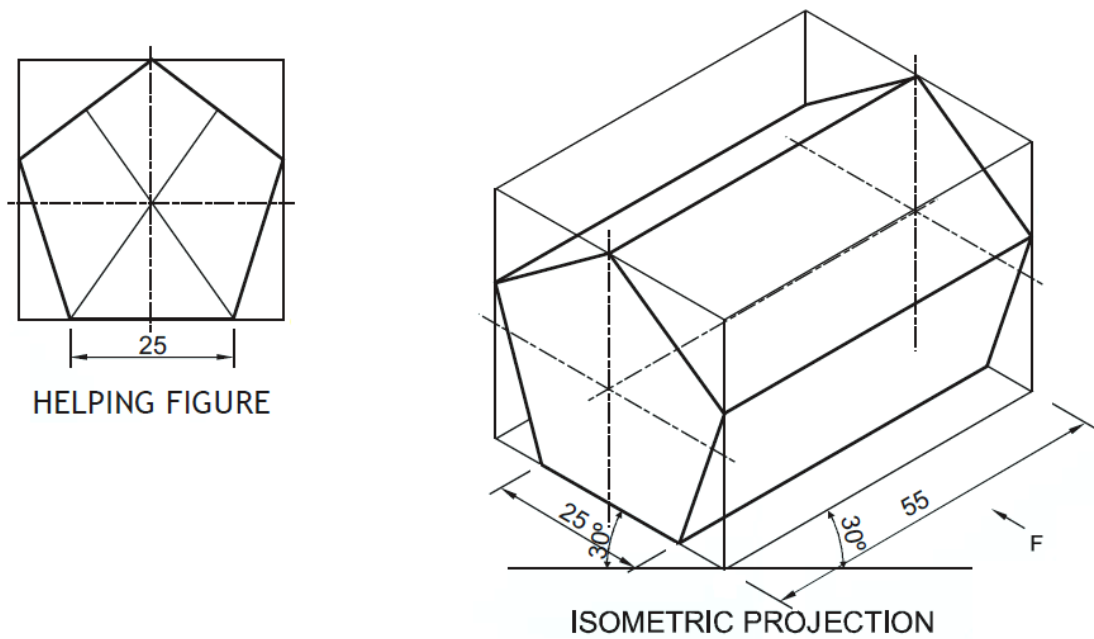
|               |                              |   |                               |
|---------------|------------------------------|---|-------------------------------|
|               |                              |   |                               |
| <b>3. (i)</b> | <b>SQUARE THREAD PROFILE</b> |   | <b>8</b>                      |
|               |                              | 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                             |
|               |                              | <b>[ OR ]</b>   |                               |
|               | <b>HEXAGONAL HEADED BOLT</b> |   | <b>8</b>                      |
|               |                              | Drawing head of the bolt.   | 3                             |
|               |                              | Drawing shank of the bolt with threaded portion.  | 2                             |
|               |                              | Drawing side view.  | 1                             |
|               |                              | Standard dimensions.  | 2                             |
| <b>(ii)</b>   | <b>60° CSK HEAD RIVET</b>    |   | <b>5</b>                      |
|               |                              | Front view with vertical axis.  | 2 <sup>1</sup> / <sub>2</sub> |
|               |                              | Top view.   | 1 <sup>1</sup> / <sub>2</sub> |
|               |                              | Standard dimensions.  | 1                             |
|               |                              | <b>[ OR ]</b>   |                               |
|               | <b>STUD WITH SQUARE NECK</b> |   | <b>5</b>                      |
|               |                              | Front view with horizontal axis.  | 2 <sup>1</sup> / <sub>2</sub> |
|               |                              | Side view.  | 1 <sup>1</sup> / <sub>2</sub> |
|               |                              | Standard dimensions.  | 1                             |
| <b>4.</b>     | <b>TURNBUCKLE (Assembly)</b> |   |                               |
|               | (a)                          | <b>FRONT VIEW UPPER HALF IN SECTION:</b>  | <b>15</b>                     |
|               |                              | 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)                          | <b>SIDE VIEW:</b>   | <b>7</b>                      |
|               |                              | Drawing two circles of body.  | 2                             |
|               |                              | Drawing conventional end of rod with threading.   | 2 <sup>1</sup> / <sub>2</sub> |
|               |                              | Drawing both supporting plates at a distance of 32 mm.                                  | 2                             |
|               |                              | Drawing cutting plane.  | 1 <sup>1</sup> / <sub>2</sub> |
|               | <b>DETAILS :</b>             |   | <b>6</b>                      |
|               |                              | Printing title.   | 1                             |
|               |                              | Scale used.   | 1                             |
|               |                              | Projection symbol.  | 1                             |

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

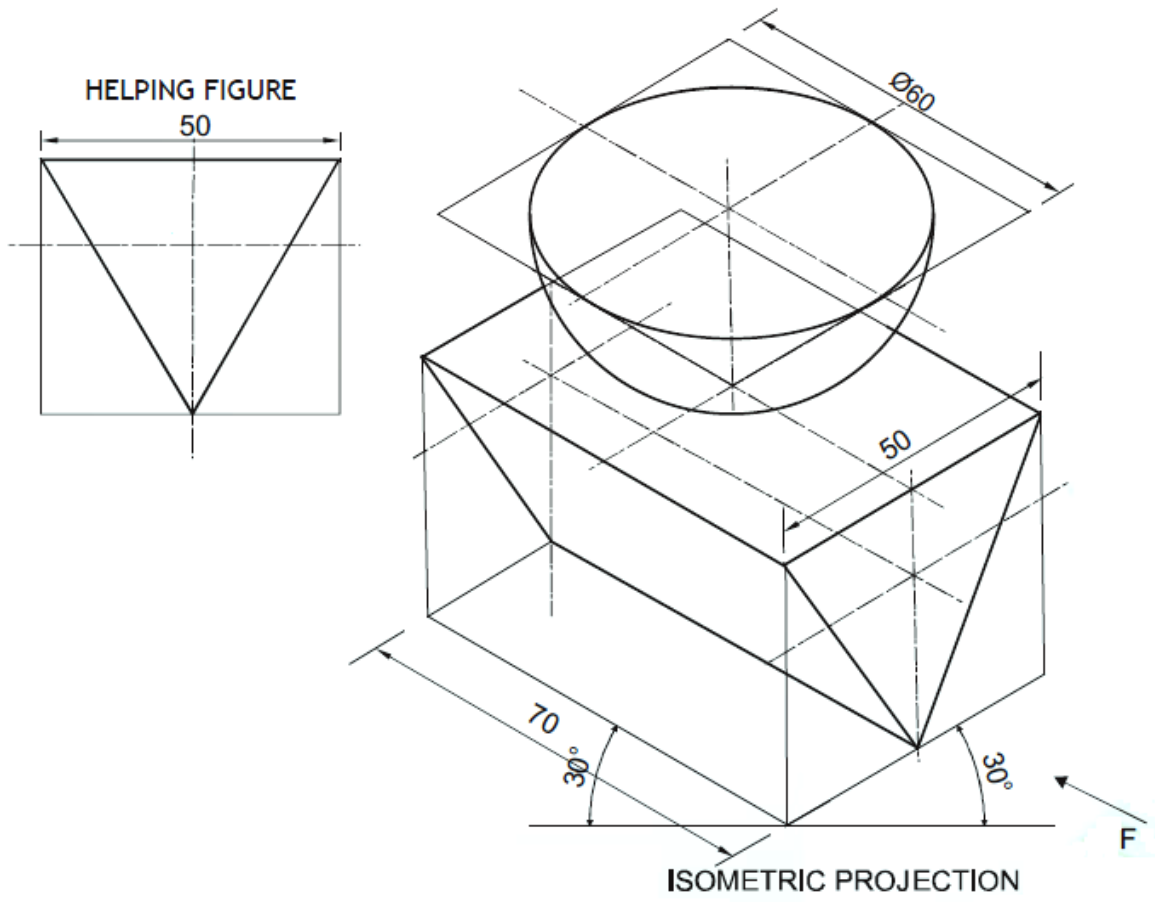
2(a)



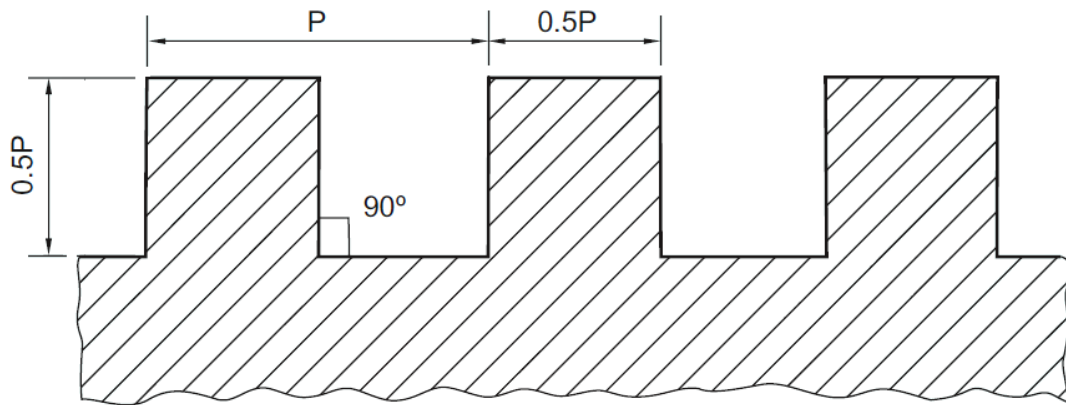
2(b)



2(c)



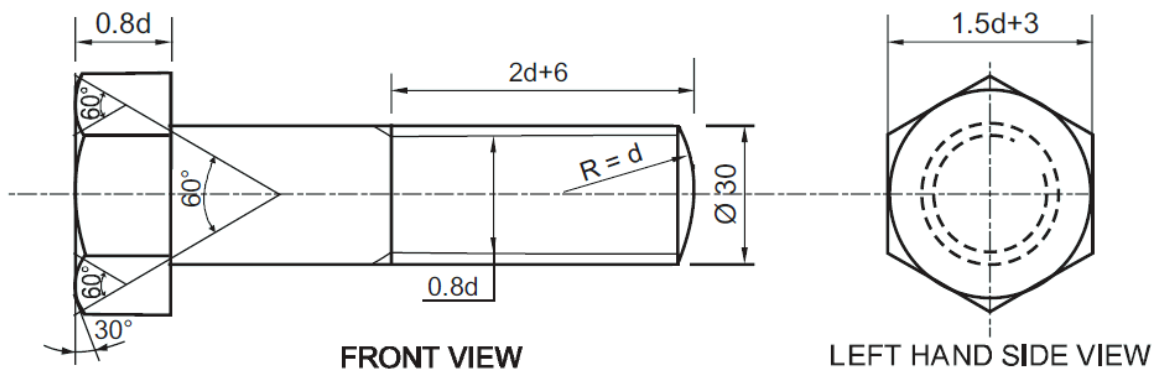
3(a)



| P  | 0.5P | ANGLE |
|----|------|-------|
| 60 | 30   | 90°   |

**SQUARE THREAD PROFILE**

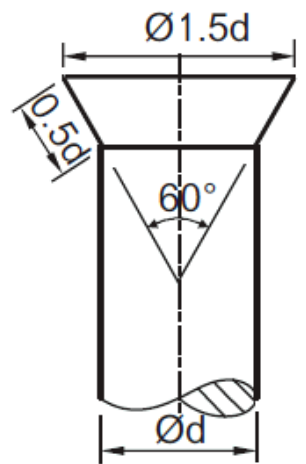
**OR**



$\varnothing d = 30\text{mm}$

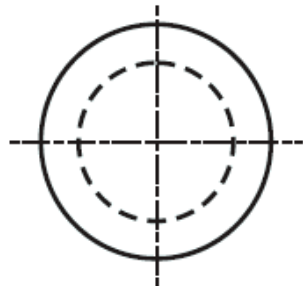
**HEXAGONAL BOLT**

3 (b).



|      |    |
|------|----|
| d    | 20 |
| 0.5d | 10 |
| 1.5d | 30 |

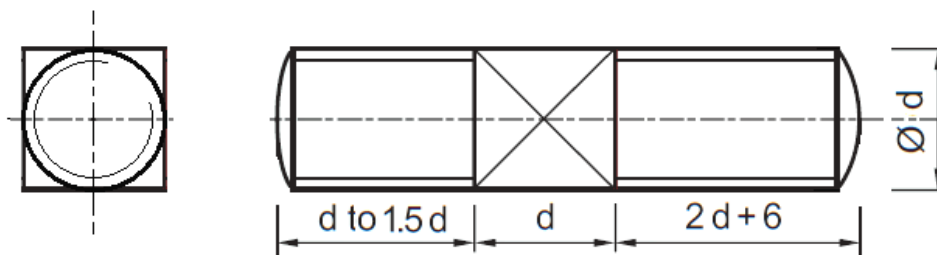
FRONT VIEW



TOP VIEW

60° CSK HEAD RIVET

**OR**



SIDE VIEW

FRONT VIEW

d = 20mm

STUD WITH SQUARE NECK

4.

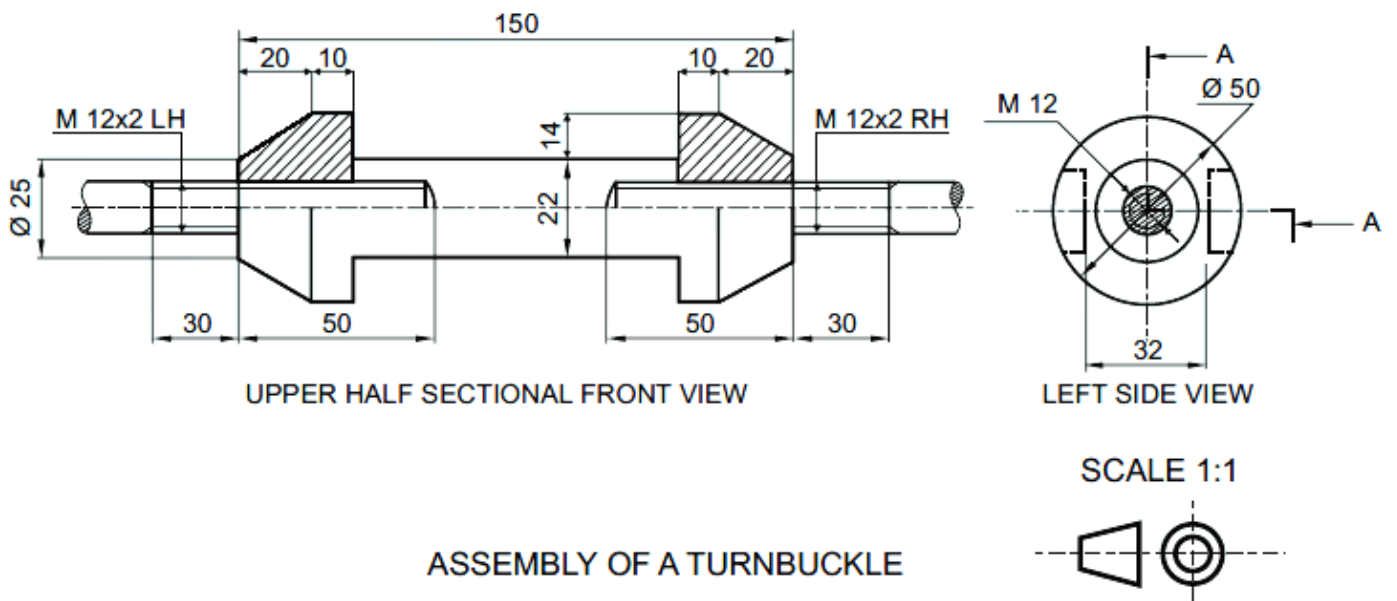


Figure 1

OR



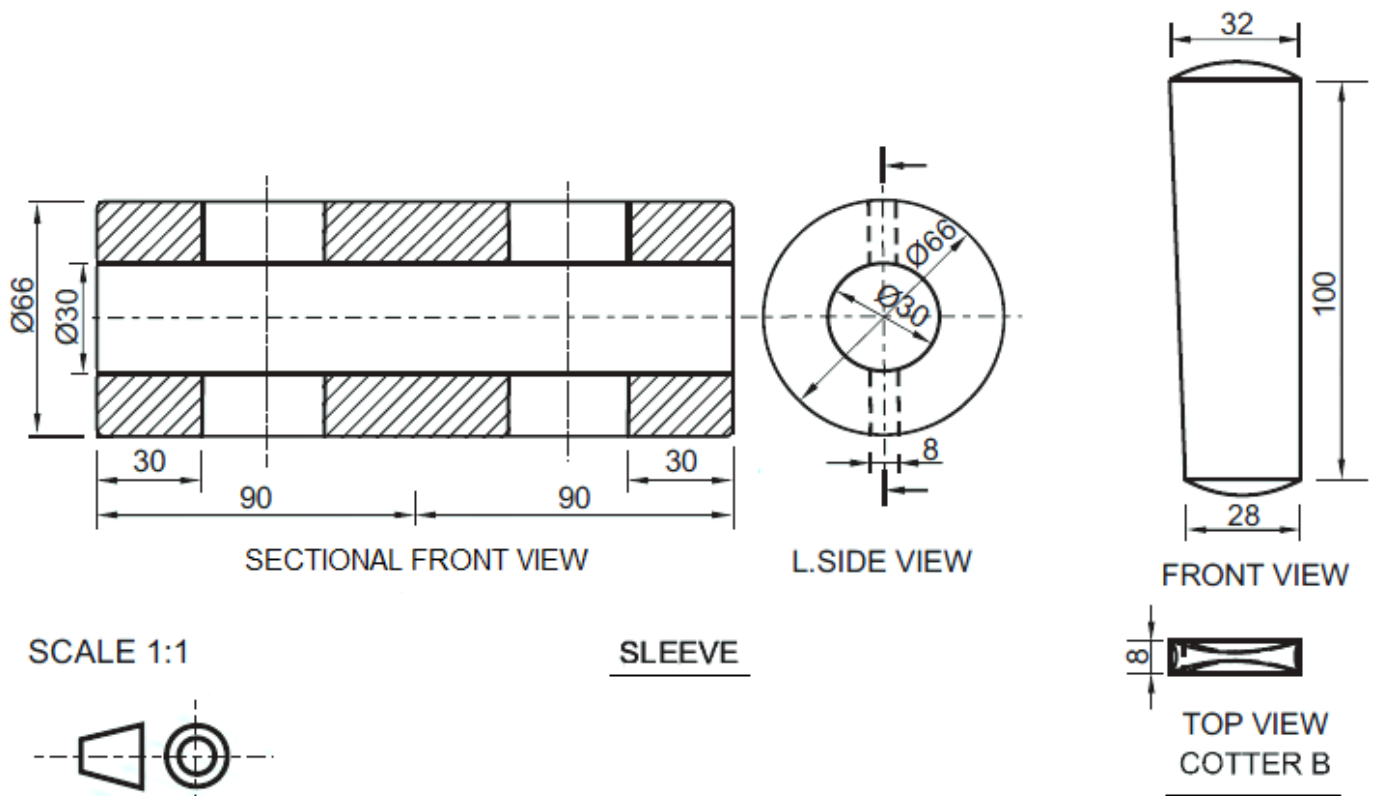


Figure 2