

MODEL QUESTION PAPER

MACHINE DRAWING

[Maximum Marks: 75]

[Time: 3 Hours]

- [Note: -
1. A2 size drawing sheet will be supplied.
 2. Both side of the sheet can be used.
 3. Use of BIS tables and charts are permitted.
 4. Theory part answers should write in answer book.
 5. Missing data if any suitably assumed.
 6. Sketches are accompanied. All dimensions are in mm.
 7. All drawing should be in first angle projections.]

Module-I

(Maximum marks: 15)

Marks

I. Answer any *one* of the following questions. Each question carries 15 marks.

1. Draw two views of a single rivetted lap joint for 18mm thick plates. Show at least three rivets in plan and indicate all dimensions in terms of the diameter of rivet. Use snap head rivet.
2. Draw full sectional elevation and end view of a square headed bolt with nut and washer assembly for to connect two vertical blocks of 20mm thick. Take bolt size as M16. Assume that the bolt has a chamfered end. Indicate all dimensions in terms of the bolt diameter.

(1 x 15=15)

Module-II

(Maximum marks: 15)

II. Answer any *one* of the following questions. Each question carries 15 marks.

1. Compute the limit dimensions for a clearance fit based on hole basis system, if Basic hole size= $\text{Ø}30\text{mm}$, Minimum clearance= 0.010mm, Tolerance on the hole=0.023mm, Tolerance on the shaft= 0.011mm. Represent the limit dimensions schematically and do the check.
2. A fully dimensioned knurled rest pin is shown in figure.1. Copy the given figure and indicate the given surface roughness values using grade numbers as per BIS.

Surface- A	0.8microns. Then surface A is Chromium plated and finished to a roughness value of 0.4 microns
Surface- B	3.2 microns
Surface- C	1.6 microns

Surface- other than A, B and C	6.3 microns
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(1 x 15=15)

Module-III

(Maximum marks: 30)

III. Answer any *one* of the following questions. Each question carries 30 marks.

1. Draw the top half sectional elevation and end view looking from the bolt head side of a flanged coupling (Unprotected type) given in figure 2. Dimension the views and prepare the item list showing quantity and material of items.
2. Draw the left half sectional elevation and top view of a Stuffing Box from the given detailed view shown in fig.3. Dimension the views and prepare the item list showing quantity and material of items.

(1 x 30=30)

Module-IV

(Maximum marks: 15)

IV. Answer any *one* of the following questions. Each question carries 15 marks.

1. To prepare the production drawing of a Slip bush shown in fig-4. incorporating following requirements: a) Finish the inside ($\text{Ø}30$) and outside ($\text{Ø}42$) cylindrical surfaces to a roughness value of $0.4 \mu\text{m}$. All the remaining surfaces are supposed to have a roughness value of $3.2 \mu\text{m}$. b) The inside diameter of the bush should have an upper and lower deviations of $+0.028\text{mm}$ and $+0.015\text{mm}$ respectively while the outside diameter has a tolerance of h6. C) Outside diameter of the bush should have a concentricity tolerance of 0.02mm with the axis of the cylindrical hole of diameter 30mm .
2. To prepare the shop floor drawing of Sleeve given in figure-5 by incorporating all the specified requirements.
 - a) Surface 1 should not have a radial run out greater than 0.008mm with respect to the axis of the sleeve. Also, the surface should be contained between two parallel planes 0.008mm apart.
 - b) Surface 1 and 2 should be parallel to each other with a parallelism tolerance of 0.004mm .
 - c) Surface 3 should have a geometrical circularity and cylindricity tolerances within 0.003mm each.
 - d) Surface 4 has radial run out limited to 0.008mm with respect to the axis, circularity tolerance limited to 0.003mm and a cylindricity tolerance of 0.003mm .

(1 x 15=15)

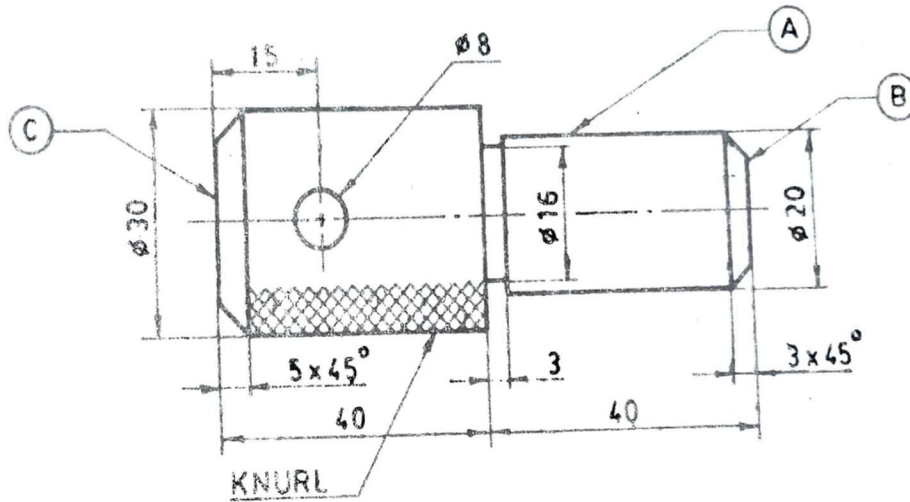


Figure-1 Knurled rest pin

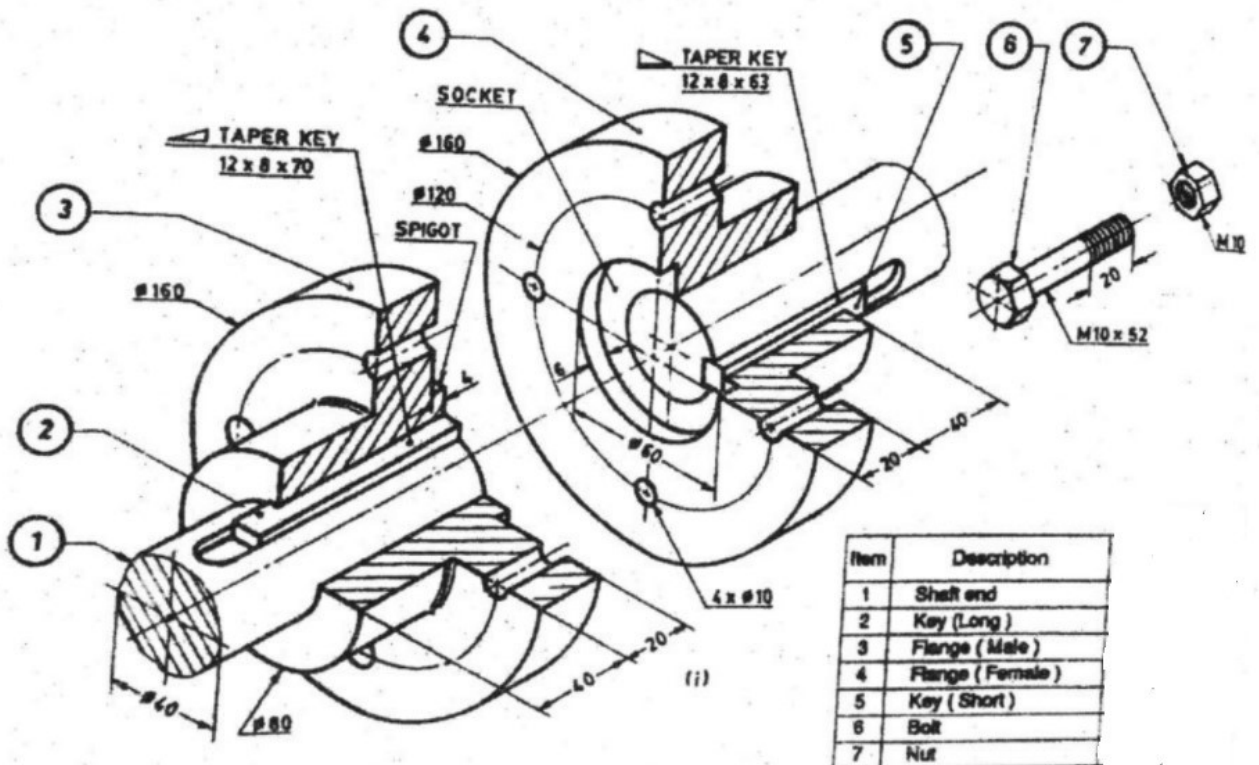


Figure-2. Flanged Coupling (Unprotected type)

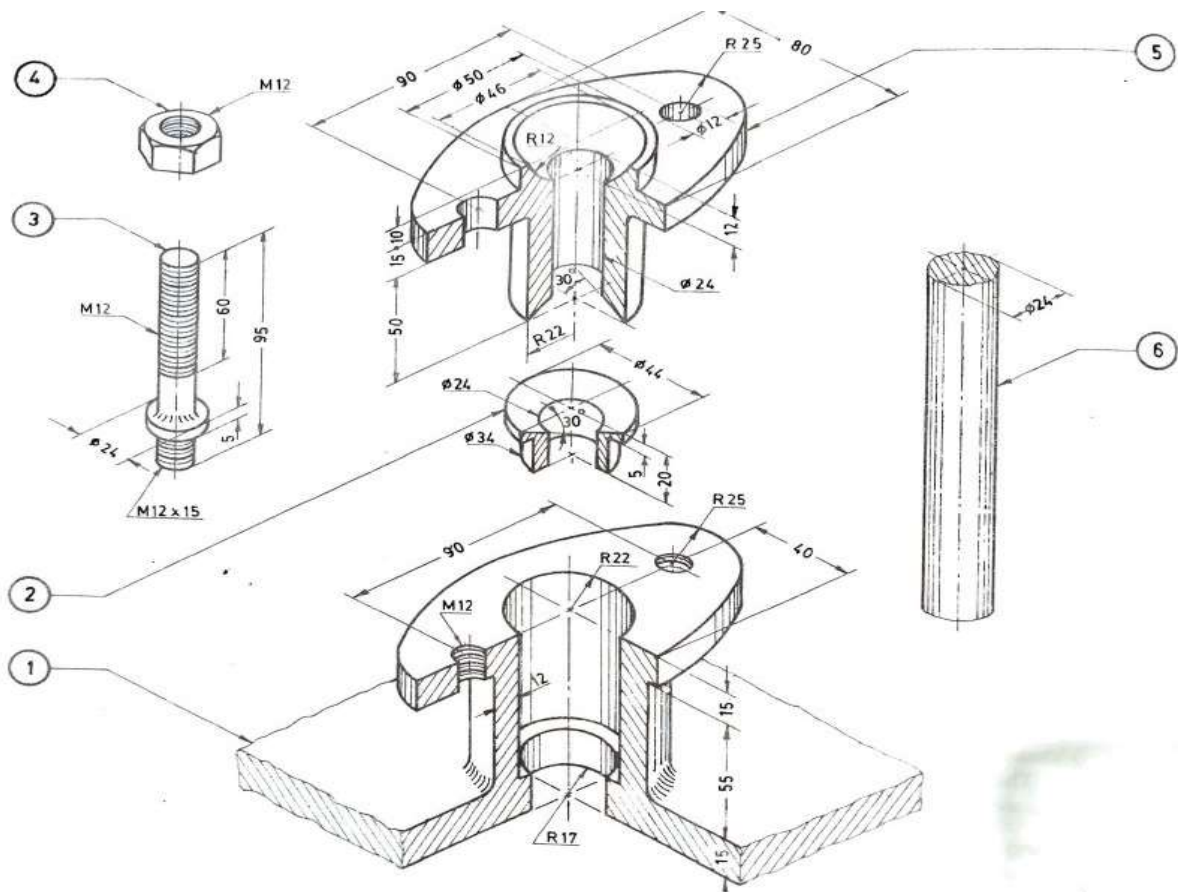


Figure-3 Stuffing box

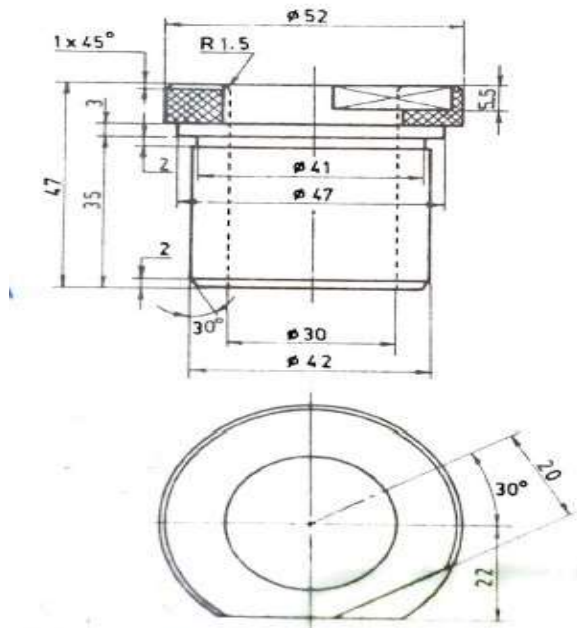


Figure-4 Slip Bush

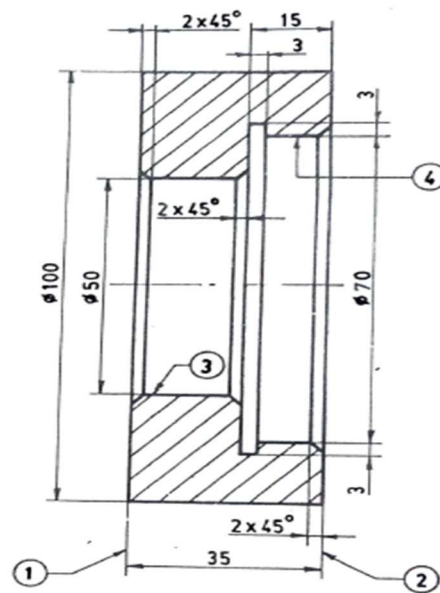


Figure-5 Sleeve

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Module-I

(Maximum marks: 15)

Marks

I. Answer any *one* of the following questions. Each question carries 15 marks.

1. Draw weld symbol for the following joints.
 - a) Square butt weld
 - b) Fillet weld
 - c) Backing run
 - d) Single V butt weld
 - e) Single J butt weld
2. Draw front and top view of the following locking arrangements:
 - a) Nut with a split pin
 - b) Nut with a spring washer

(1 x 15=15)

Module-II

(Maximum marks: 15)

II. Answer any *one* of the following questions. Each question carries 15 marks.

1. Explain the following fit with necessary sketch: -
 - a) Clearance fit
 - b) Interference fit
 - c) Transition fit
2. Redraw the Brass bush shown in figure-1 and mark the actual surface roughness values and the machining process indicated below: -
 - 1) 'a' represents turning to 12.5 μm
 - 2) 'b' represents grinding to 0.8 μm finish
 - 3) 'c' represents reaming to 1.6 μm finish
 - 4) 'd' represents boring to 6.3 μm finish.

(1 x 15=15)

Module-III

(Maximum marks: 30)

III. Answer any *one* of the following questions. Each question carries 30 marks.

1. An isometric view of a knuckle joint is shown in figure-2. Draw the top half sectional elevation and end view looking from left side. Dimension the views and prepare the item list showing quantity and material of items.
2. Draw the right half sectional elevation and top view of Plummer block shown in fig.3. Dimension the views and prepare item list showing quantity and material of items.

(1 x 30=30)

Module-IV
(Maximum marks: 15)

IV. Answer any *one* of the following questions. Each question carries 15 marks.

1. A stepped shaft is shown in figure-4. Read the following:
 - a) A4 x 0.3
 - b) Dimensional tolerances of: 1) $\text{Ø}55\text{k}6$ 2) $\text{Ø}75\text{h}6$ 3) $\text{Ø}65\text{n}6$ 4) 20P7
 - c) Geometrical tolerance of the frame: 1) Connected with the cylindrical surface with $\text{Ø}70$ and datum surface with $\text{Ø}55\text{k}6$ 2) Connected with the cylindrical surface with $\text{Ø}75\text{h}6$ and datum surface with $\text{Ø}55\text{k}6$ 3) Connected with the cylindrical surface with $\text{Ø}75\text{h}6$ and the end face of cylindrical of diameter $\text{Ø}55\text{k}6$
2. Two views of a slotted nut are shown in figure-5. Redraw the given figure by taking $d_1 = \text{Ø}25$, $d_2 = \text{Ø}36.6$, $d_3 = 36$ and $h = 12$ and indicate following geometrical tolerances: 1) End faces of the nut are parallel with a geometrical tolerance of 0.02mm 2) The datum axis of the nut to which the tolerance frame is connected, should be contained in a cylindrical zone of diameter 0.2mm coaxial with the datum.

(1 x 15=15)

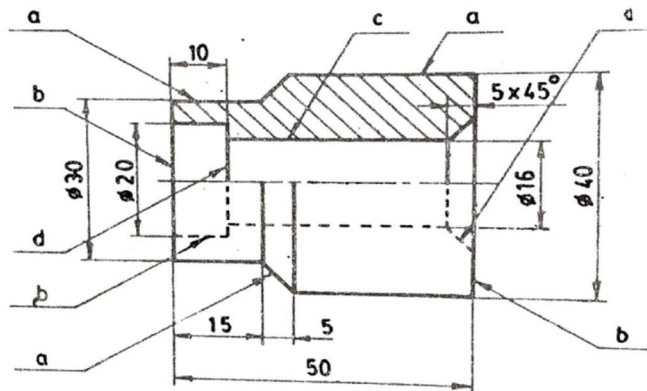


Figure-1 Brass bush

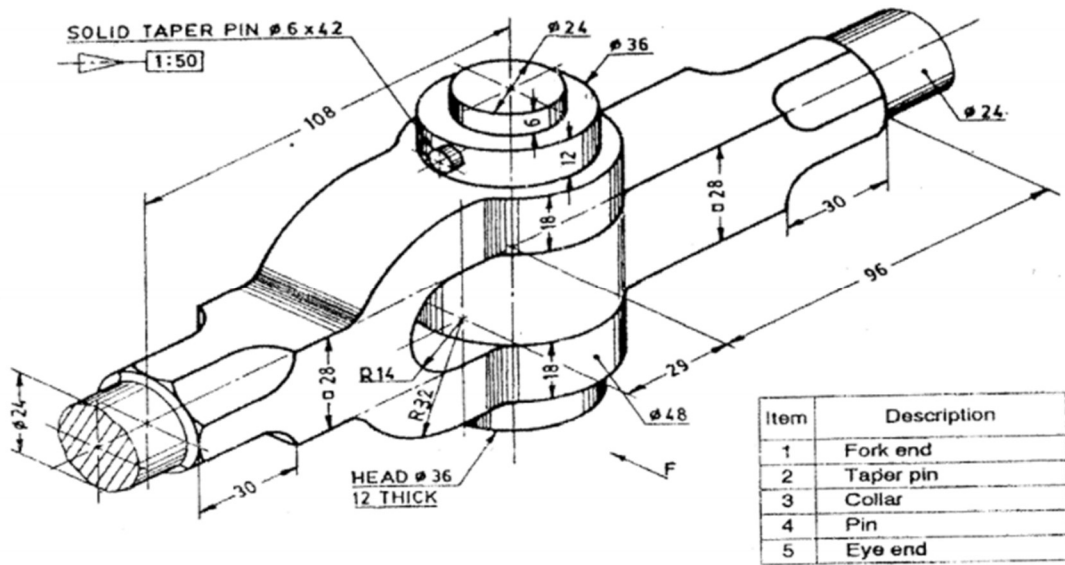


Figure-2. Knuckle joint

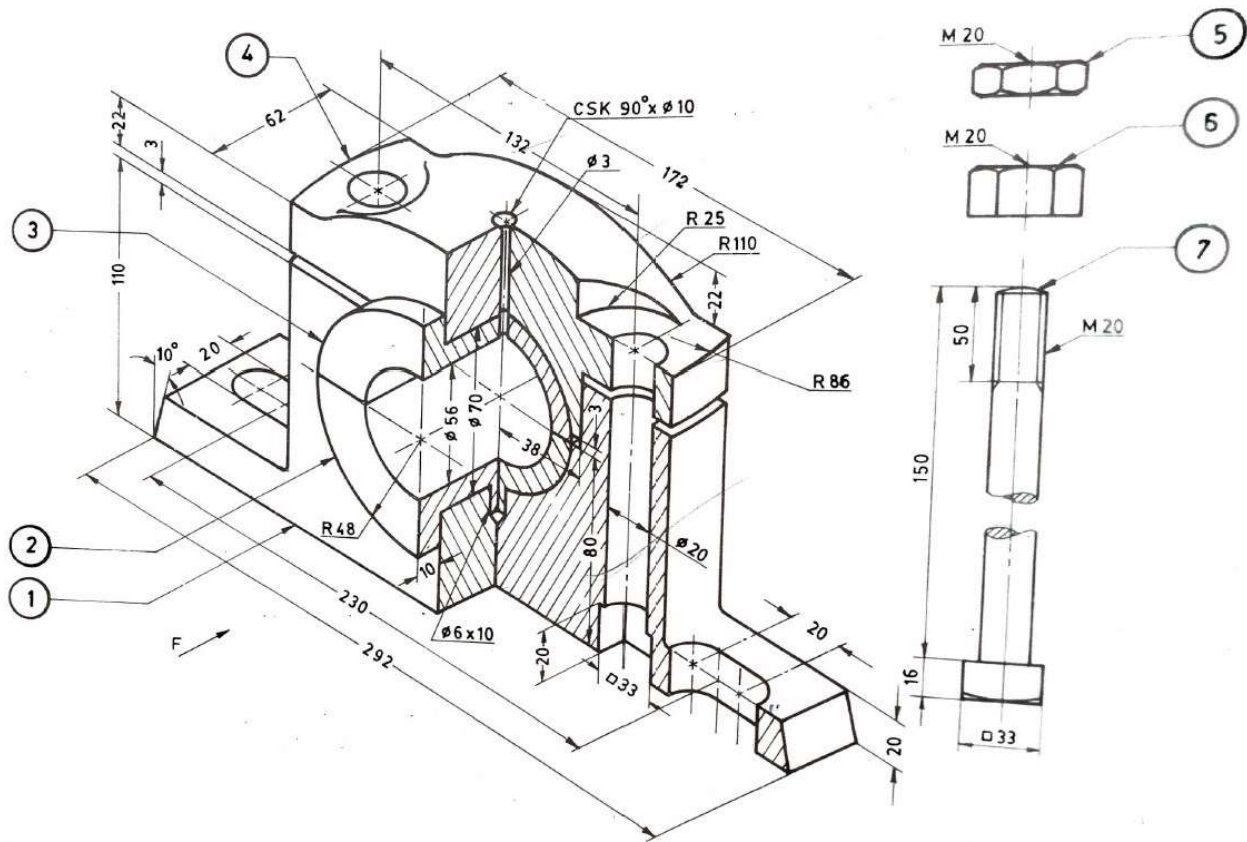


Figure-3 Plummer block

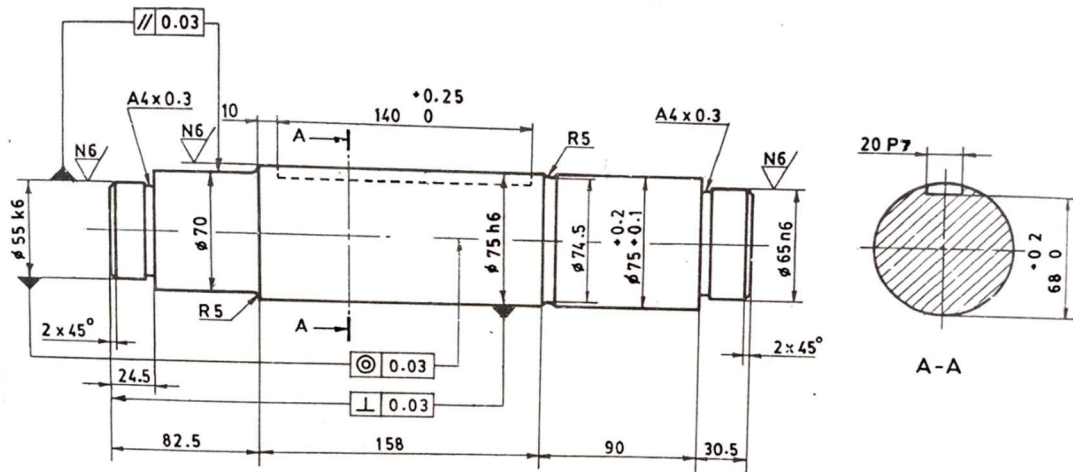


Figure-4 Stepped shaft

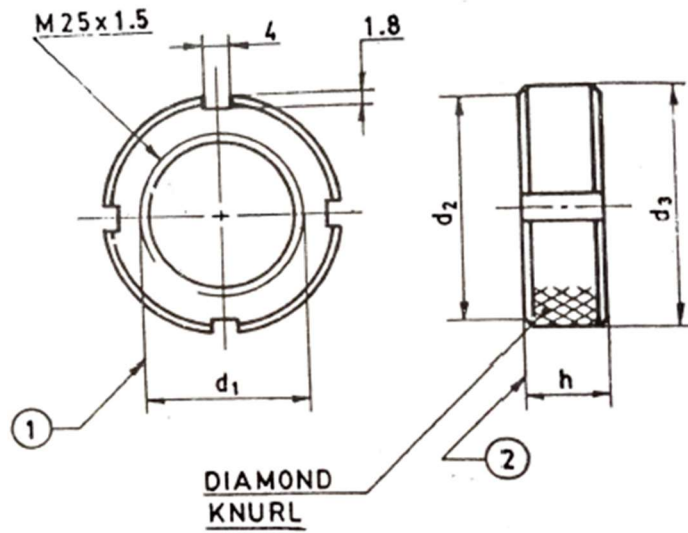


Figure-5 Slotted nut