DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2023

<u>MACHINE DRAWING</u>

[Maximum Marks: **75**]   [Time: **3** Hours]

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

Module - I

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

(1 x 15 = 15 Marks)

		Module Outcome	Cognitive level
1.	Draw the plan and sectional elevation of a single riveted single strap butt joint for joining plates of thickness 10 mm. Show at least three rivets in plan. Use snap head rivet. Insert all dimensions in terms of diameter of the rivet.	M1.04	A
	OR		
2.	A square headed bolt with a square nut and a washer is used to connect two vertical blocks, each 25 mm thick. Draw the full sectional elevation and end view from the nut side keeping the head of the bolt as seen across the corners while the nut as seen across the flats in the elevation. Size of the bolt = M 16 Length of the bolt = 75 mm Thread length = 36 mm Also designate the bolt with nut as per standard	M1.04	A

Module - II

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

(1 x 15 = 15 Marks)

		Module Outcome	Cognitive level
1.	Compute the limit dimensions of the shaft and the hole for a clearance fit based on shaft basis system, if Basic size = Ø30mm, Minimum clearance= 0.007 mm, Tolerance on the hole=0.021 mm, Tolerance on the shaft=0.021mm. Represent the limit dimensions schematically and check the calculated dimensions. **OR**	M2.01	U
2.	Figure.1 shows top half sectional elevation of a brass bush. The surfaces indicated by lower case letters are to be machined as detailed below. **a** represents turning to 12.5 µm finish **b** represents grinding to 0.8 µm finish **c** represents reaming to 1.6 µm finish **d** represents boring to 6.3 µm finish Redraw the given figure and indicate the actual surface roughness values and the machining process.	M2.02	U

Module - III

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

(1 x 30 = 30 Marks)

		Module Outcome	Cognitive level
III.	An isometric view of a Knuckle joint is shown in figure 2. Draw the top half sectional elevation of the joint and end view looking from the left side. Dimension the views and also prepare the item list. **OR**	M3.02	A
IV.	Draw the left half sectional elevation and top view of a Stuffing Box from the given detailed views (figure 4). Dimension the views and also prepare the item list	M3.02	A

Module - IV

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

(1 x15 = 15 Marks)

Module Outcome   Cognitive level

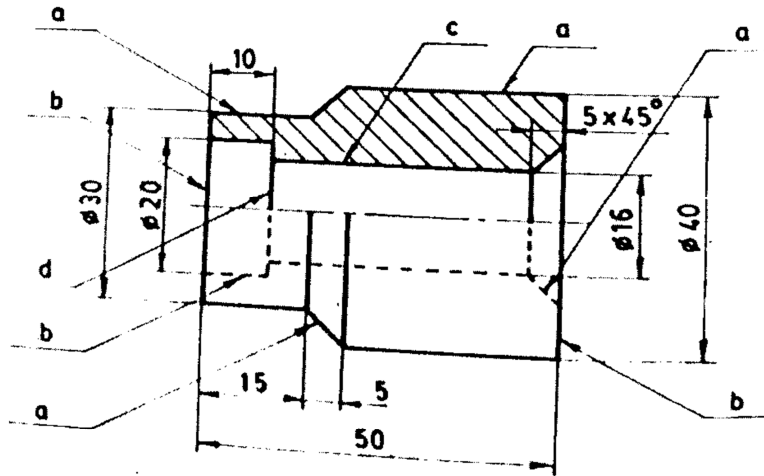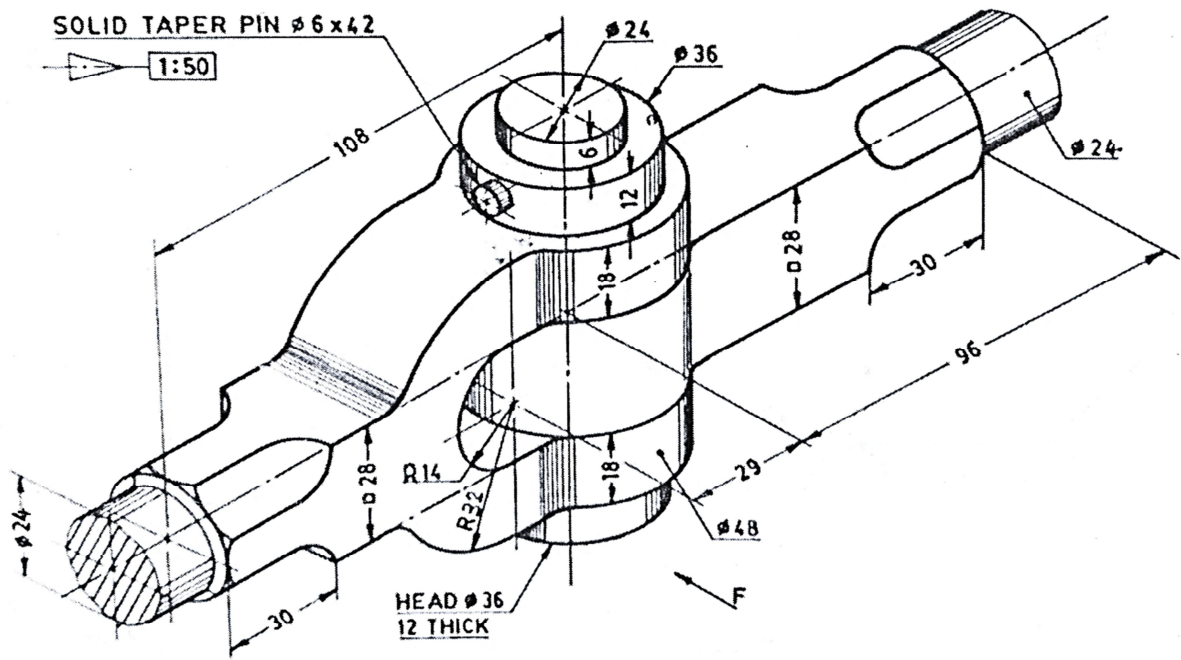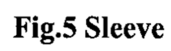|		Module Outcome	Cognitive level
V.	Two views of a Slotted nut are shownin figure 3. The following dimensions may be taken: $d_1 = \varnothing25$, $d_2 = \varnothing36$, $d_3 = \varnothing36.6$ and h=12. The nut is to be manufactured to the following geometrical tolerances. (a) End faces of the nut are parallel with a geometrical tolerance of 0.02 mm (b) The datum axis of the nut to which the tolerance frame is connected, should be contained in a cylindrical zone of diameter 0.2 mm coaxial with the datum. (c) Both the end faces of the nut should be perpendicular to its axis with a geometrical tolerance of 0.02 mm Copy the given drawing and mark all the given dimensions. Also indicate the required geometrical tolerances as per B.I.S. **OR**	M4.02	A
IV.	Sectional elevation of a sleeve is shown in figure 5. The surfaces to be tolerenced are represented by 1, 2, 3 and 4. Prepare the production drawing incorporating following 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 0.008 mm apart. b) Surface 1 and 2 should be parallel to each other with a parallelism tolerance of 0.004 mm. c) Surface 3 should have a geometrical circularity and cylindricity tolerances within 0.003 mm each. d) Surface 4 has radial run out limited to 0.008 mm with respect to the axis, circularity tolerance limited to 0.003 mm and a cylindricity tolerance of 0.003 mm.	M4.02	A

Fig.1 Brass Bush

SOLID TAPER PIN ⌀6 x 42

1:50

Fig.2 Knuckle Joint

Fig.3 Slotted Nut

Fig.4 Stuffing Box

Fig.5 Sleeve

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