22341

11819

4 Hours / 70 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions :
(1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(7) Retain all construction lines and nomenclature.

Marks

1. **Attempt any FIVE of the following :**   **10**

(a) Draw the conventional representation of the following :

    (i) Cylindrical helical compression spring of wire of circular cross-section

    (ii) Semi-elliptic leaf spring.

(b) Draw a part showing fillet radius and chamfered edge.

(c) Draw the conventional representation of :

    (i) Spur gear

    (ii) Bevel gear

(d) Draw the actual view and conventional representation of

    (i) External screw thread

    (ii) Straight knurling

(e) Draw a sketch showing basic size, lower deviation, upper deviation and tolerance.
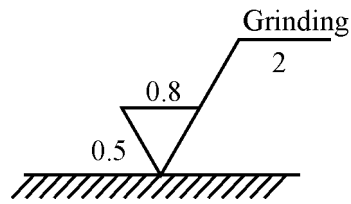
(f)   State the meaning of the symbol shown in Fig. 1.

Fig. 1

(g)   Refer Fig. 2 and state the meaning of symbol at X.
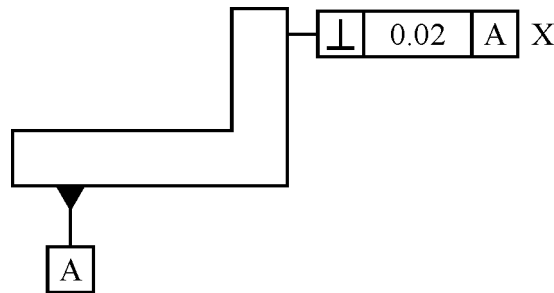

Fig. 2

2.   **Attempt any TWO of the following :**   **12**

(a)   A vertical cylinder 85 mm diameter is penetrated by another cylinder of 60 mm diameter, the axis of which is parallel to both H.P. and V.P. The two axes are 8 mm apart. Draw the projections showing curves of intersection.

(b)   A vertical square prism base 50 mm side has its faces equally inclined to V.P. It is completely penetrated by another square prism of base 30 mm side, the axis of which is parallel to both H.P. and V.P. and is 6 mm away from the axis of the vertical prism. The faces of horizontal prism are also equally inclined to the V.P. Draw the projections of solids showing the lines of intersection.

(c)   A square hole of 35 mm side is cut in a cylindrical shaft 75 mm diameter and 125 mm long. The axis of the hole intersects that of the shaft at right angles. All faces of the hole are inclined at 45° to the H.P. Draw the three views of the shaft when the plane of the two axes is parallel to the V.P.

3. **(A)** **Attempt any ONE of the following :** **4**

   (a) Write the symbol for light press fit, and give its two applications.

   (b) A bush bearing has internal diameter $\phi\ 25^{+0.025}_{+0.000}$ mm and the shaft diameter is $\phi\ 25^{-0.020}_{-0.040}$ mm. Find the minimum and maximum clearance and identify the type of fit between bush and shaft.

(B) **Attempt any TWO of the following :** **12**

   (a) Draw the development of the lateral surface of the cylinder having a square hole in it as shown in the Fig. 3.
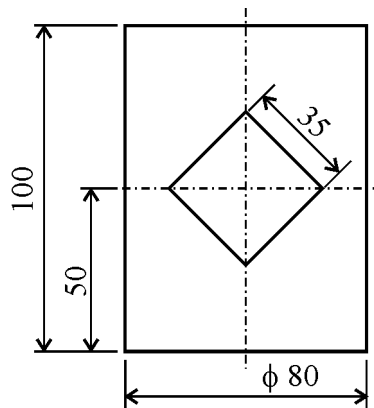

Fig. 3

   (b) Draw the development of lateral surface of Part 'A' and Part 'B' of a right angle elbow shown in Fig. 4.
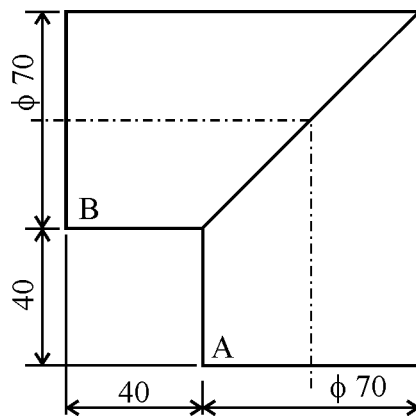

Fig. 4

   (c) A right circular cone diameter of base 60 mm and axis 60 mm long is resting on its base on H.P. It is cut by a section plane perpendicular to V.P. and inclined at 45° to H.P. and bisecting the axis of cone. Draw the front view, top view and development of lateral surface of the cone.

4. Attempt the following : **16**

Fig. 5 shows assembly of a Drill Jig. Attempt any TWO of the following :

(a) Draw sectional front view and top view of Base plate and stem.

(b) Draw sectional front view and Top view of Jig Plate and Washer.

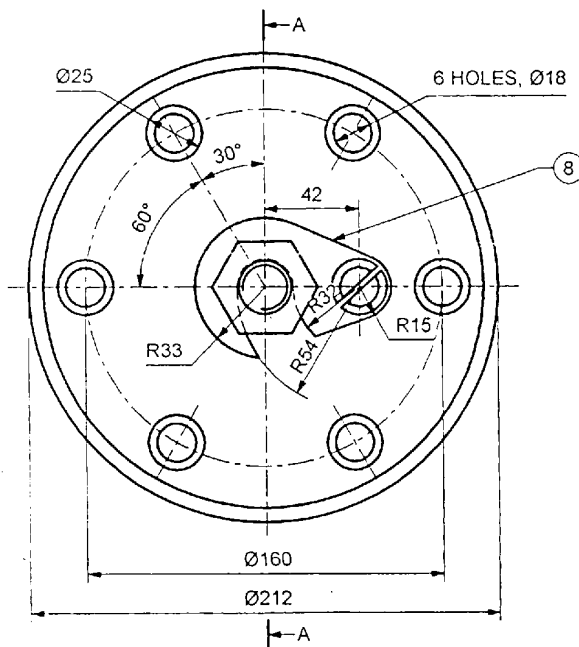(c) Draw Front view and side view of Stud, Nut, Bush and screw (Part No. – 9).
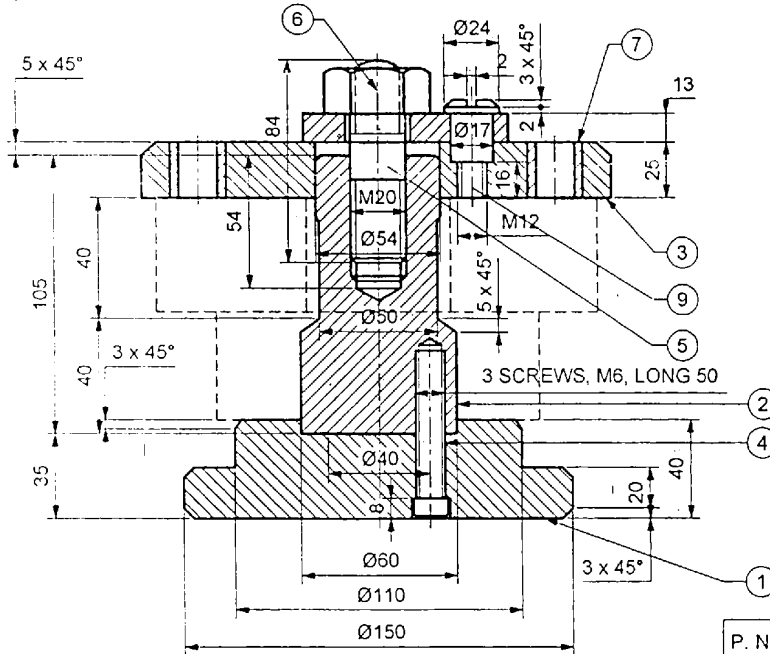
PART LIST

P. NO.	PART NAME	MAT	QTY.
1	BASE PLATE	C.I.	1
2	STEM	M.S.	1
3	JIG PLATE	C.I.	1
4	SCREW	M.S.	3
5	STUD	M.S.	1
6	NUT	M.S.	1
7	BUSH (JIG)	STEEL	6
8	WASHER	M.S.	1
9	SCREW	M.S.	1

TOLERANCE CHART

$60H7 = {}^{+0.030}_{+0.000}$	$60f7 = {}^{-0.030}_{-0.049}$
$54H7 = {}^{+0.030}_{+0.000}$	$54F7 = {}^{-0.030}_{-0.049}$
$25H7 = {}^{+0.021}_{+0.000}$	$25n6 = {}^{+0.028}_{+0.015}$

DRILL JIG
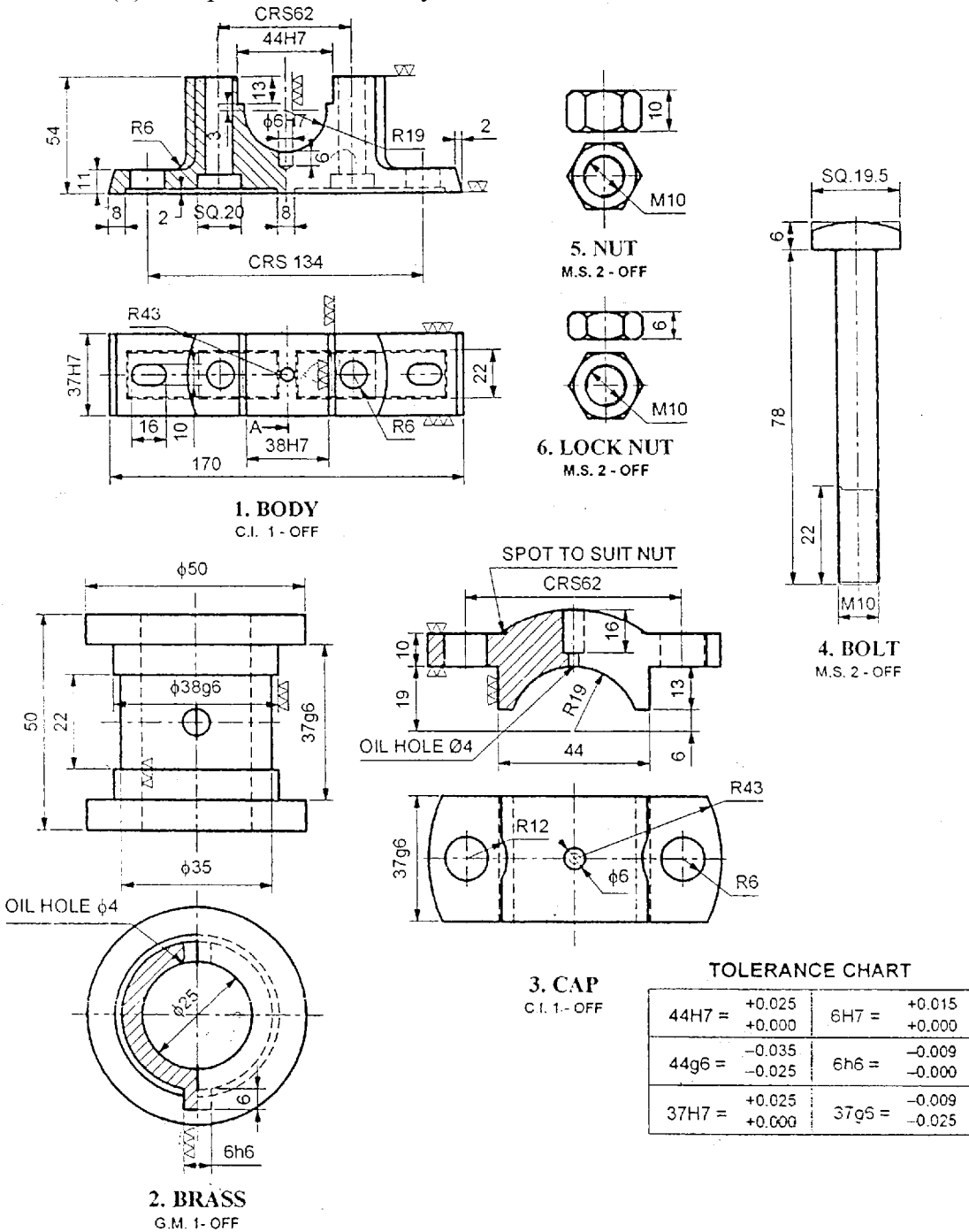**Fig. 5**

5. **Attempt any ONE of the following :** 16
   (a) Fig. 6 shows details of Pedestal Bearing.
   Draw :
   (i) Half Sectional front view of Assembly
   (ii) Top view of Assembly

1. BODY
C.I. 1 - OFF

5. NUT
M.S. 2 - OFF

6. LOCK NUT
M.S. 2 - OFF

4. BOLT
M.S. 2 - OFF

3. CAP
C.I. 1 - OFF

2. BRASS
G.M. 1 - OFF

TOLERANCE CHART

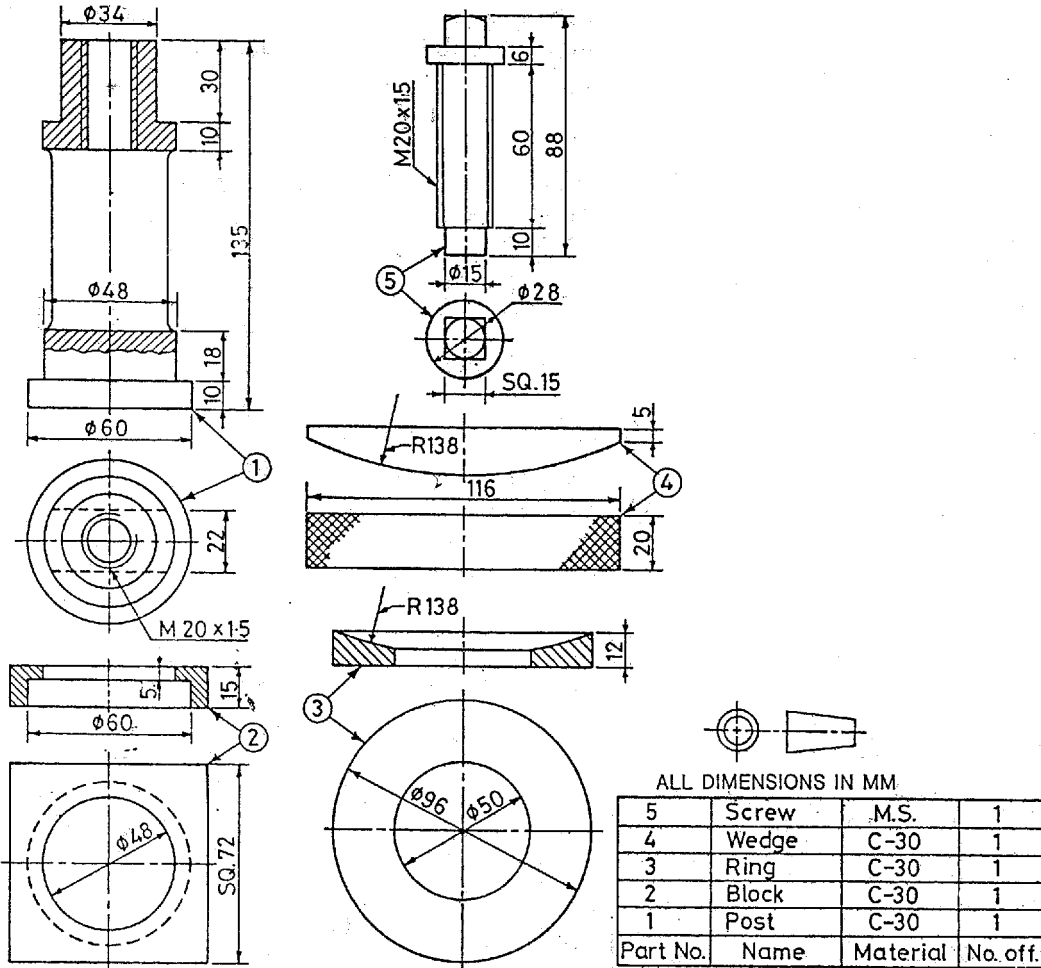| 44H7 =	+0.025 +0.000	6H7 =	+0.015 +0.000
44g6 =	−0.035 −0.025	6h6 =	−0.009 −0.000
37H7 =	+0.025 +0.000	37g6 =	−0.009 −0.025

PEDESTAL BEARING
Fig. 6

(b) Fig. 7 shows details of Tool Post. Draw :

(i) Half sectional front view of Assembly

(ii) Top view of Assembly

5	Screw	M.S.	1
4	Wedge	C-30	1
3	Ring	C-30	1
2	Block	C-30	1
1	Post	C-30	1
Part No.	Name	Material	No. off.

ALL DIMENSIONS IN MM

TOOL-POST

Fig. 7