B. MECHANICAL ENGINEERING 1ST YEAR 1ST SEMESTER SUPPLEMENTARY EXAMINATION, 2017

ENGINEERING DRAWING

Time: 4 Hours Full Marks: 100

Answer any two from Group A and any two from Group B

Group A drawings should be in full scale. BIS standard scales must be chosen for Group B.

Angle of projection and **scale** must be clearly indicated wherever applicable. Any unfurnished dimension may be taken proportionately. Avoid redundant dimensioning.

Group A

1. (a) Following engineering drawing lettering conventions, write the sentence given below using upright capital letters having 7 mm height.
   THERE IS NO SUBSTITUTE OF HARD WORK
   (b) Draw a regular hexagon circumscribing a circle of 50 mm diameter.

   10+10

2. A roller of 50 mm diameter is rolling on a straight path. Draw the locus of any point on the roller for one full revolution.

   or

   Draw an Archimedean spiral of one convolution with the shortest and longest radii of 20 mm and 80 mm length respectively.

   20

3. Any two:
   (a) Draw a diagonal scale of approximately 6 inch in length on the drawing sheet to measure inch, foot and yard with a scale of 1:20. Hence show a distance of 1 yard 2 feet 7 inches on the scale.
   (b) Draw an ellipse of 80 mm major diameter and 50 mm minor diameter.
   (c) Draw a simple scale of 1:50 to show meters and decimeters and long enough to measure 7 meters. Show a length of 3.7 meter on it.
   (d) A straight line AB of 50 mm length is inclined at 45^0 to the HP and 30^0 to the VP. Draw the projections of the line AB if its end point A is 15 mm from the HP and 10 mm from the VP. Assume the line to be in the first quadrant.

   10+10

4. Any two:
   (a) A straight line AB of 60 mm length has the point A 20 mm below HP and 30 mm behind VP. The line makes 30° with VP and 45° with HP. The line is oriented downward, backward and right from A to B. Draw HP and VP projections of the line with respect to Ground line.

(b) The coordinates (X,Y,Z) of the end points of the straight line CD are C(10,-15,40) and D(60,25,-30). Find the true length of the line and the angle made by the line with VP and HP. Consider X rightward, Y backward and Z upward positive.

(c) Draw isometric view of the projection shown in figure 1.

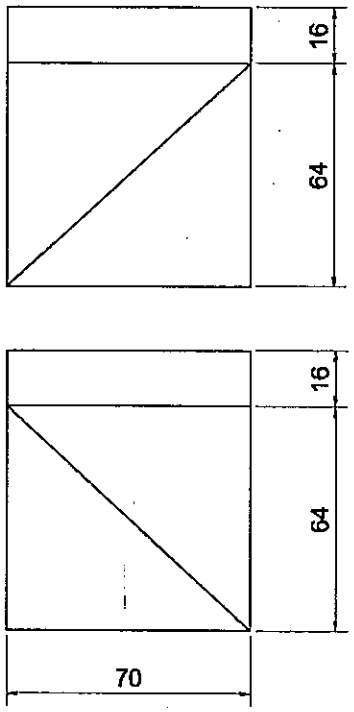

Figure 1

10+10

Group B

5. A truncated regular pentagonal right pyramid with 30 mm base side, 20 mm top side and height 40 mm is kept with its axis vertical such that one of the sides of the base is parallel to VP. A right equilateral triangular prism of 15 mm base side and 35 mm length rests centrally on the truncated pyramid by one of its rectangular faces such that the axis of the prism makes 45° with VP. Draw three principal views of the combination such that the views are at least 10 mm away from the planes of projection. Use third angle projection method.

or

An equilateral triangular pyramid of height 40 mm and base side 20 mm is placed coaxially with the axis vertical on the top of a regular hexagonal prism of height 20 mm and base side 30 mm. One of the sides of the base of the pyramid is parallel to the vertical plane and one of the rectangular faces of the prism makes 45o with the vertical plane. Draw front view, top view and one side view of the combination. The views should be placed 10 mm away from the HP, VP and PP.

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6. Draw the front view, looking from the direction of the arrow, the top view, and the left-hand-side view of the object shown in figure 2.

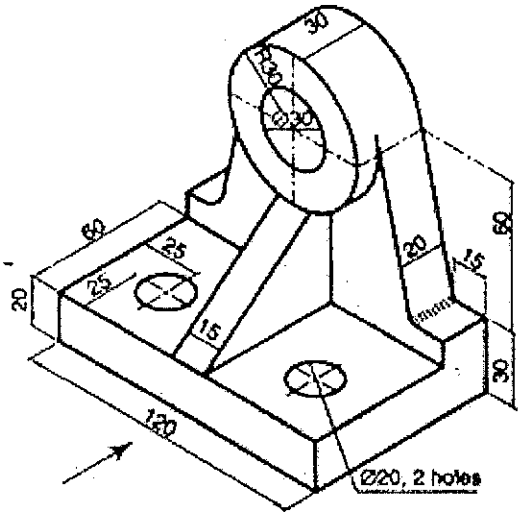

Figure 2

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7. Draw the front view, the top view, and the left-hand-sectional-side view of the body shown in figure 3. The front is shown by the arrowhead. Use third angle projection method.

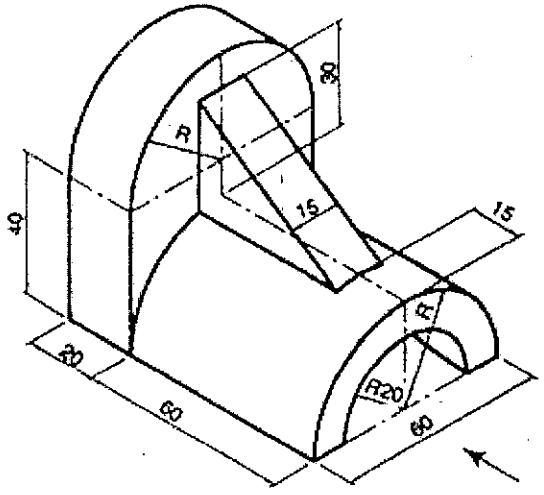

Figure 3

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8. Draw the front view, the top view, and the right hand side view in full section of the object as shown in figure 4. Front is shown by the arrow.

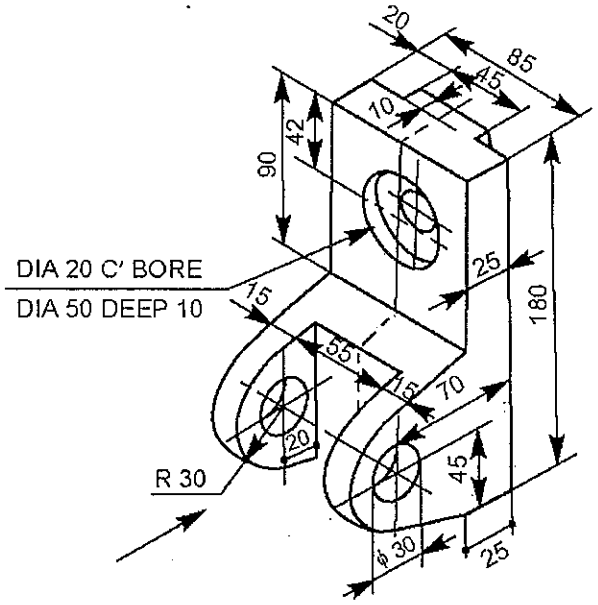

Figure 4

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