Ref. No. **Ex/PROD/ES/B/T/214/2024(S)**

B.E. PRODUCTION ENGINEERING, SECOND YEAR, FIRST SEMESTER
SUPPLEMENTARY EXAM 2024
SUBJECT: PROJECTION AND SPATIAL GRAPHICS

Time : Three hours **Full Marks 100**

All the drawings must be drawn with utmost care using proper INSTRUMENTS. Improper drawing will be penalized.

1. An area 144cm^2 on a map represents an area of 36km^2 on the field. Find the R.F. of the scale for this map and draw a diagonal scale to show kilometers, hectometers and decimeters and to measure up to 10 kilometers. Indicate on the scale, distance of 7.69km and 1.03km.(CO1) **10**

2. Draw the three orthographic views (**THIRD ANGLE PROJECTION**) of the object shown in **Fig.1** taking front view from the arrow side with proper dimension, scale and angle of projection. (CO2) **15**

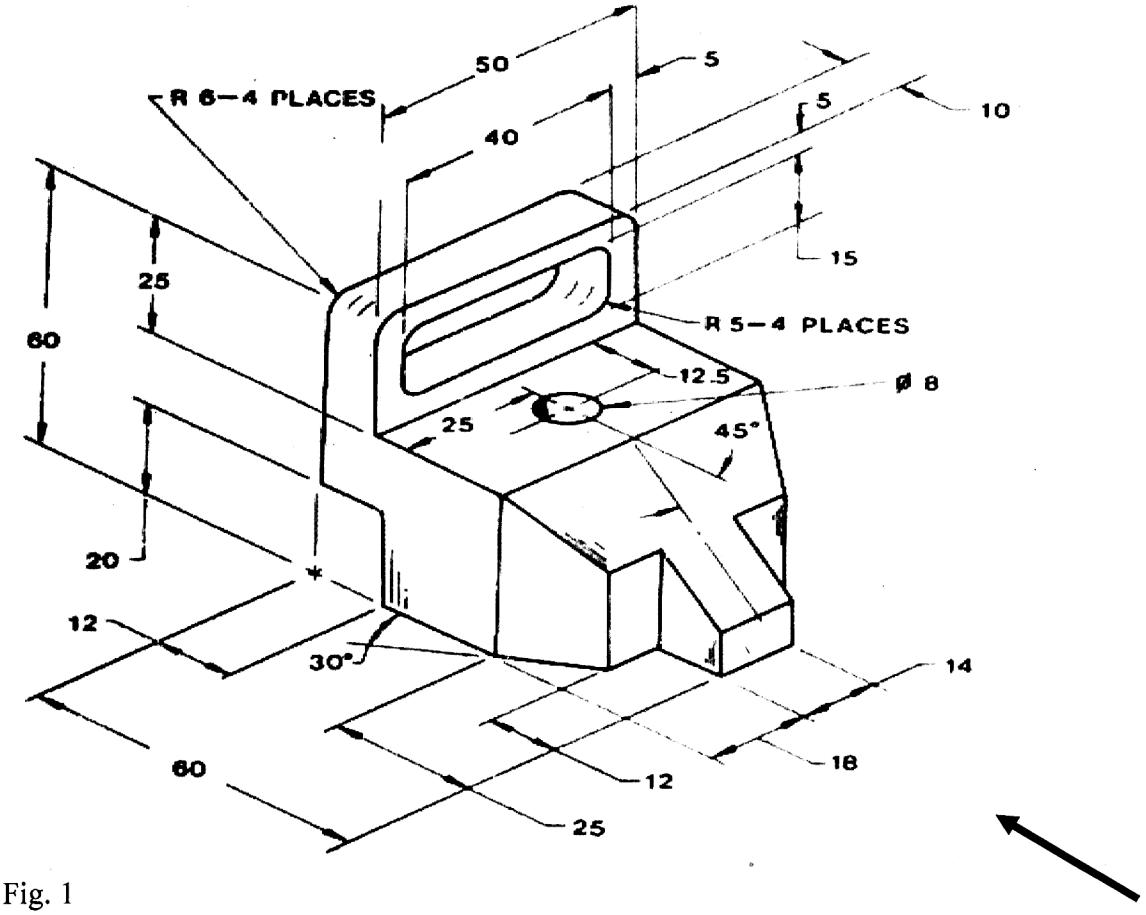

Fig. 1

[Turn over

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3. Draw the Isometric view with proper dimension of the following object (**Fig.2**). (CO2) **15**

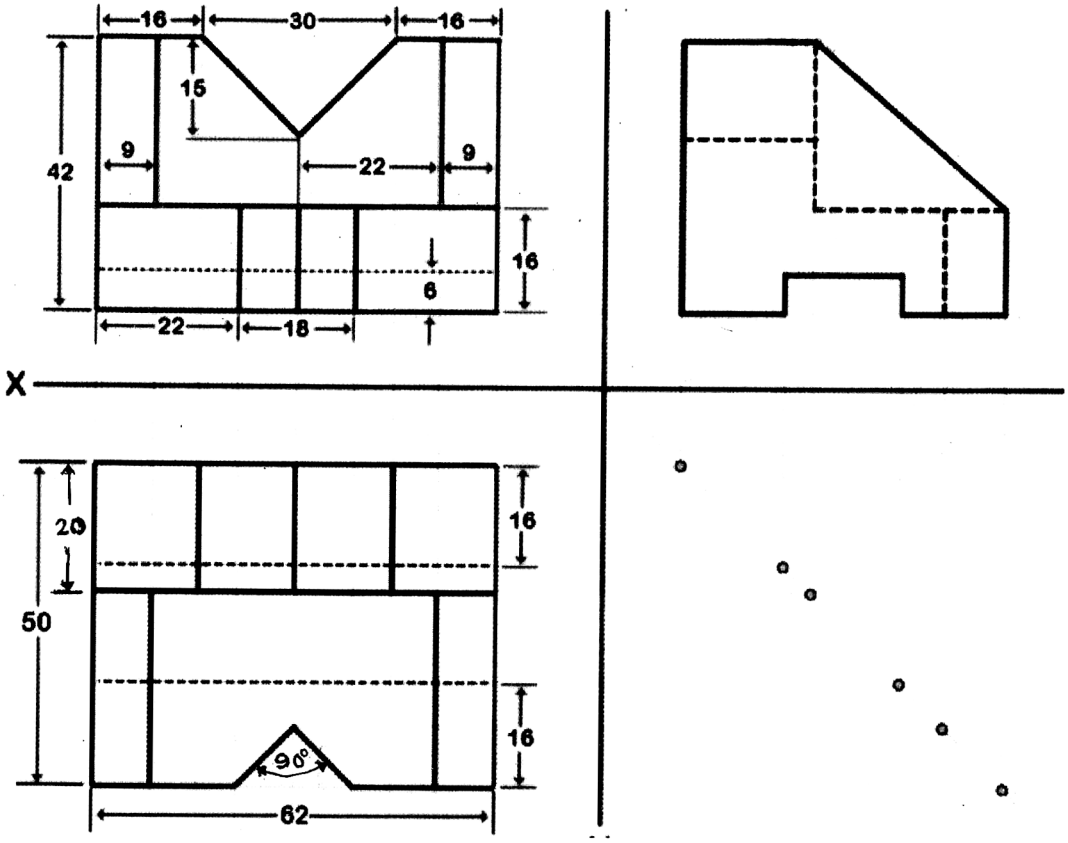

Fig. 2

4. Draw a isosceles triangle ABC ($\overline{AB} = \overline{AC}$), which is lying on the plane BCP. The area of ΔABC and ΔBCP are equal. Also the point A and P lying on same side with respect to BC line. The co-ordinate of points B, C and P are given below: **20**

B(10, 50, 20), C(60, 5, 30) and **P(40, 40, 40)**

Graphically find the area of the isosceles triangle ABC and co-ordinate of point A. (CO3)

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5. A right regular **PENTAGONAL PYRAMID**, edge of base 30mm and height 60mm, is held on ground plane on one of its base corners, such that its axis is inclined at 45° to HP and 30° to VP. Draw its projections in third angle. **20**

Must draw the right regular pentagon with proper geometric construction method with circum-circle. (CO4)

OR

A right regular **PENTAGONAL PYRAMID**, edge of base 30mm and height 65mm, is lying on one of its triangular faces on ground plane such that its axis is parallel to VP. A section plain perpendicular to the VP and inclined to the HP at 60° cuts the pyramid meeting its axis at a distance of 30mm from the vertex. Draw its front view, sectional top view and true shape of the section. **20**

Must draw the right regular pentagon with proper geometric construction method with circum-circle. (CO4)

6. A **SQUARE PRISM**, edge of base 45mm and height 90mm, resting on its base in HP, with a face inclined at 30° to VP, is completely penetrated by another square prism, edge of base 36mm and 100 mm long, having its faces equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections of the solids showing lines of intersection. **15+5**

Also develop the lateral surface development of the penetrating prism (any one side). (CO5)