Form A: *Ref. No.* **Ex/Prod/T/I16/2019 (Old)**

B.E. PRODUCTION ENGINEERING FIRST YEAR FIRST SEMESTER EXAM 2019 (Old)

SUBJECT: PROJECTION AND SPATIAL GRAPHICS

Time : Three hours **Full Marks 100**

Answer any *Five* questions

All the graphical construction should be done by following the proper geometrical method

1. a) Explain the principle of the **vernier scale.** 3

b) An actual distance of 1000 km between two points on a map is shown by a line 25 cm long. Construct the corresponding **backward vernier** scales of kilometers, and also represent the distance of 792 km and 495km on the scale. 17

2 Draw the three orthographic view (**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 20

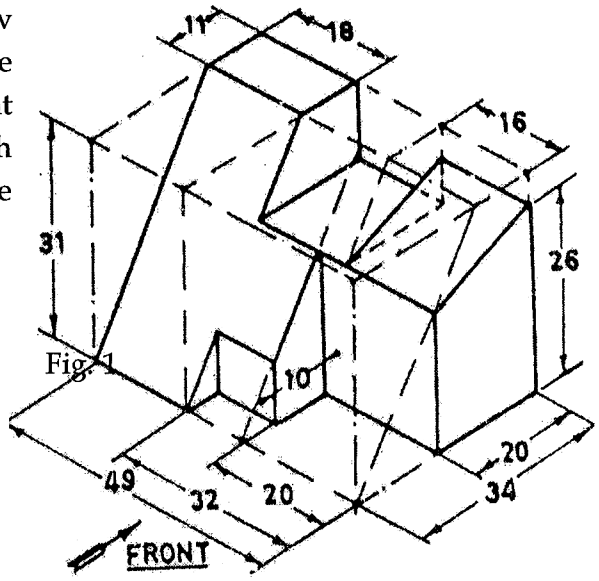

Fig. 1

3. Draw a parallelogram ABCD, which is lying on the plane BCP. The point P is midpoint of line AD. The co-ordinate of points B, C and P are given below: 20

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

Find the co-ordinate of A, D and also find out Area of parallelogram ABCD **graphically.**

4. A pentagonal pyramid, side of base 30 mm and length of axis 66mm, is held so that one of its triangular faces is in VP and the base edge contained by the face is inclined at 45° to HP. Draw its front and top views. Assume the pyramid any suitable distance away from the HP. 20

P.T.O.

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5. Draw the Isometric view with proper dimension of the following object (**Fig.2**). **20**

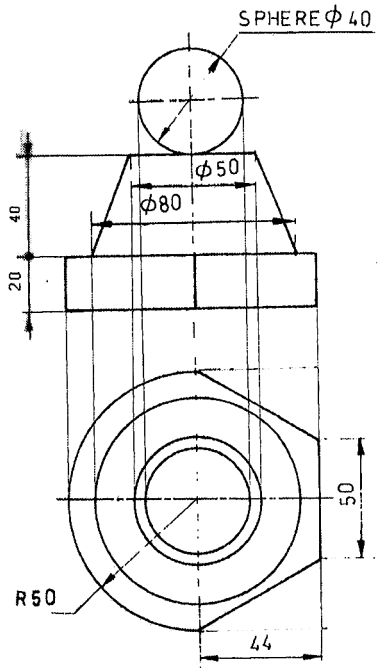

Fig. 2

6. 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**

7. A vertical cylinder of ∅50mm and height 80mm, resting on its base in HP is completely penetrated by another cylinder of the same dimensions. The axes of the two cylinders bisect each other at right angles. Draw their projections showing curves / lines of intersection. **13+7**

   Also develop the lateral surface development of the horizontal Vertical cylinder (any one side).