

Roll No. ....

Total Pages : 03

**BH/D-21**

**41042**

ENGINEERING GRAPHICS & DESIGN

ES-109A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. Assume any missing data.

### Unit I

1. Draw a hypo-cycloid when the diameters of the rolling and directing circle are respectively equal to 50 mm and 150 mm. Draw a normal and tangent to the curve at any point on the curve. **15**
2. The actual length of 500 m is represented by a line of 15 cm on a drawing. Construct a Vernier Scale to read upto 600 m. Mark on the scale a length of 549 m. **15**

### Unit II

3. A straight line EF of 50 mm length has its end point E 10 mm above the HP and 10 mm in front of VP. Draw the projections of EF if it is inclined at  $30^\circ$  to the HP while its top view is perpendicular to the XY line. Find the angle of inclination of EF with the VP. **15**

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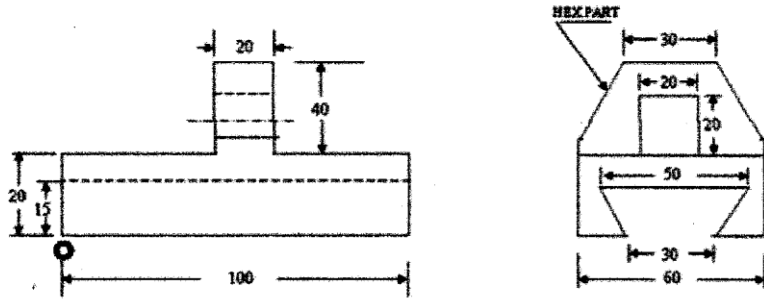
4. A pentagonal pyramid has an edge of the base in the VP and inclined at  $30^\circ$  to the HP, while the triangular face containing that edge makes an angle of  $45^\circ$  with the VP. Draw three views of the pyramid. Length of the side of the base is 30 mm, while that of the axis is 80 mm. **15**

### **Unit III**

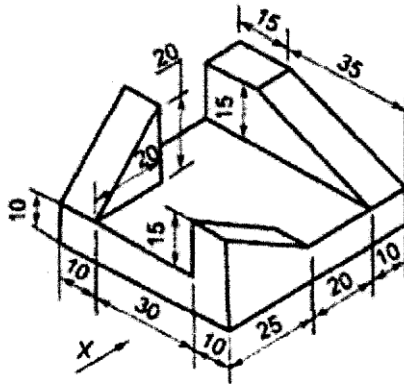
5. A cylinder, 65 mm diameter and 90 mm long, has its axis parallel to the HP and inclined at  $30^\circ$  to the VP. It is cut by a vertical section plane in such a way that the true shape of the section is an ellipse having the major axis 75 mm long. Draw its sectional front view and true shape of the section.
6. A hexagonal prism of base side 30 mm and axis height 70 mm is resting on its base on HP with one of its faces parallel to VP. It is cut by plane perpendicular to VP and inclined at  $35^\circ$  to HP, meeting the axis at a distance of 40 mm from the base. Draw the development of lateral surfaces of the lower portion of the prism.

### **Unit IV**

7. Draw the isometric view of the given orthographic projection of the object on pages No. 3 :



8. Draw the front view, looking in the direction of arrow X, side view and the top view of the object given below :



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