

I B. Tech I Semester Regular Examinations, January-2024**ENGINEERING GRAPHICS**

(Common to CE, ME, ECE, IT, AME, Mining, Robotics, Agri E, ECE-Allied, CSE-Allied)

Time: 3 hours

Max. Marks: 70

*Note: 1. Question paper consists of two parts (Part-A and Part-B)**2. All the questions in Part-A is Compulsory**3. Answer ONE Question from Each Unit in Part-B***UNIT- I**

1. a) Construct a plain scale of R.F.1:50,000 to show kilometres and hectometres and long enough to measure up to 7 kilometres. Measure a distance of 54 hectometres on your scale. [7M]
- b) Construct an ellipse, with distance of the focus from the directrix as 50mm and eccentricity as $2/3$. Also draw normal and tangent to the curve at a point 40mm from the directrix. [7M]

(OR)

2. a) Construct a scale to be used with a map, the scale of which is 1cm = 500m. The maximum length to be read is 5km. Mark on the scale, a distance of 3.85km. [7M]
- b) Draw a parabola if the base is 70mm and the tangents at the base ends make 60° to the base. [7M]

UNIT- II

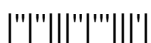
3. a) The front view of a line makes an angle of 30° with xy . The HT of the line is 45mm behind VP, while its VT is 25mm above HP. One end of the line is 10mm below HP and the other end is 90mm behind VP. Draw the projections of the line and determine (i) its true length and (ii) its inclination with HP and VP. [7M]
- b) A square plane ABCD of side 30mm, is parallel to HP and 20mm away from it. Draw the projections of the plane, when (i) two of its sides are parallel to VP and (ii) and one of its side is inclined at 30° to VP. [7M]

(OR)

4. a) A line PQ 75mm long, has its end P in the VP and the end Q in the HP. The line is inclined at 30° to the HP and at 60° to the VP. Draw its projections. [7M]
- b) An equilateral triangular plane ABC of side 40mm, has its plane parallel to VP and 20mm away from it. Draw the projections of the plane when one of its sides is (i) perpendicular to HP (ii) parallel to HP and (iii) inclined to HP at an angle of 45° . [7M]

UNIT - III

5. A square prism base 25mm side and axis 50mm long stands with one of its base edges on HP such that the axis is inclined at 30° to HP and 45° to VP. Draw the projection. [14M]
6. A square pyramid base 35mm side and axis 80mm long has a triangular face in the HP and the vertical plane containing the axis makes an angle of 45° with the VP. Draw its projections. [14M]



UNIT - IV

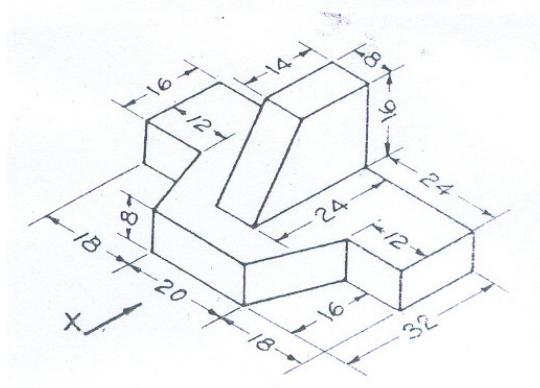
7. A cylinder of 50mm diameter and axis 70mm long, lies on HP on one of its generators such that, the axis is inclined at 45° to VP. A section plane parallel to VP passes through the farthest point of the visible base from the observer. Draw the projections of the cut solid. [14M]

(OR)

8. A square prism of side of base 40mm and axis 80mm long, is resting on its base on HP such that, a rectangular face of it is parallel to VP. Draw the development of the prism. [14M]

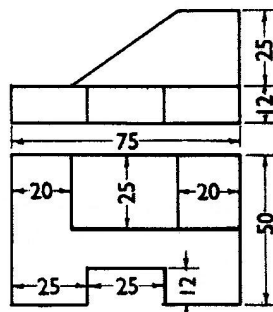
UNIT - V

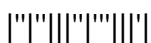
9. Draw three views of the blocks shown pictorially in figure according to first angle projection [14M]



(OR)

10. Draw the isometric projections of the object shown in fig [14M]





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3. Answer ONE Question from Each Unit in Part-B

UNIT - I

1. a) A rectangular plot of land of area 0.45 hectare is represented on a map by a similar rectangle of 5 sq. cm. Calculate the scale factor of the map. Also, construct a scale to read upto a single meter and long enough to measure 600m. Mark on it a distance of 375m. [7M]
- b) Construct an ellipse when the major axis is 120mm and the distance between the foci is 108mm. Determine the length of the minor axis. Find the foci, also draw a pair of tangents from a point outside the ellipse [7M]

(OR)

2. a) Construct a scale of 1/60 to read meters and decimeters and long enough to measure upto 6m. Mark on it a distance of 5.4m. [7M]
- b) Construct a hyperbola, with the distance between the focus and the directrix as 50mm and eccentricity as 3/2. Also, draw normal and tangent to the curve at a point 40mm from the directrix. [7M]

UNIT - II

3. a) The projectors through the HT and VT of a line are 100mm apart while those through its ends are 65mm apart. An end of the line is 15mm above the HP. The HT 40mm in front of the VP and the VT is 75mm above the HP. Draw the front view and top view of the line and find its true length. Also the inclinations the line makes with the reference planes. [7M]
- b) Draw the projections of a regular pentagon of 25mm side, with its surface making an angle of 45° with HP. One of the sides of the pentagon is parallel to HP and 15mm away from it. [7M]

(OR)

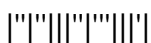
4. a) A line AB, which is inclined at 30° to HP, has its ends A and B, at 25mm and 60mm in front of VP respectively. The length of the top view is 65mm and its VT is 15mm above HP. Draw the projections of the line and locate its HT. [7M]
- b) Draw the projections of a circle of 5cm diameter, having its plane vertical and inclined at 30° to the VP. Its center is 3cm above the HP and 2cm in front of the VP. [7M]

UNIT - III

5. A hexagonal pyramid of a base edge 20mm and altitude 50mm rests on one of its base edges on the HP such that the slant face (triangular surface) containing the resting edge is perpendicular to the HP. The resting edge is inclined at 45° to the VP. Draw the projections of the pyramid. [14M]

(OR)

6. A pentagonal pyramid of base edge 25mm and altitude 55mm rests on one of its edges of the base on HP, such that this edge is inclined at 40° to VP and the slant face of the pyramid containing that edge is perpendicular to HP. Draw the projections of the solid. [14M]



UNIT - IV

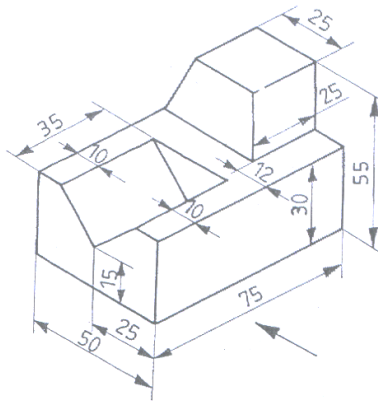
7. A hexagonal prism of side of base 30mm and length of axis 75mm, is resting on a corner of its base on HP, with the longer edge containing that corner, inclined to HP at 30° . It is cut by a section plane parallel to HP and passing through the mid-point of the axis. Draw the front and sectional top views of the solid. [14M]

(OR)

8. A hexagonal prism of side of base 20mm and length of axis 50mm is kept on the ground on its base such that two opposite sides of the base are parallel to the VP. It is cut by an AIP inclined at 45° to the HP and passing through one of the top corners of the prism. Draw the development of the cut prism. [14M]

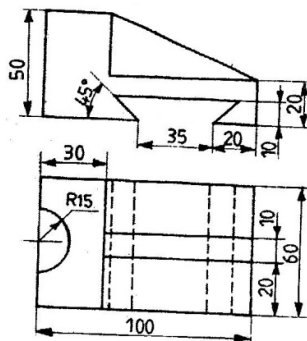
UNIT - V

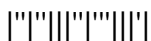
9. Draw three views of the blocks shown pictorially in figure according to first angle projection [14M]



(OR)

- 10 Draw the isometric projections of the object shown in fig [14M]





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1. a) The height of an ancient tower, Qutub Minar, is 79 yards and 1 foot. If the height is represented by a $29 \frac{3}{4}$ inch long line on the drawing, find R.F. Draw a diagonal scale of this RF long enough to show 15 yards 2 feet and 3 inches [7M]
- b) Construct a parabola with the distance of the focus from the directrix as 50mm. Also, draw normal and tangent to the curve, at a point 40mm from the directrix. [7M]

(OR)

2. a) A regular plot of 100 square kilometers is represented on a certain map by a similar rectangular area of 4 square centimeters. Draw a scale to show kilometers and mark a distance of 43 kilometers on it. [7M]
- b) Construct a hyperbola when the distance between the focus and directrix is 40mm and eccentricity is $\frac{4}{3}$. Draw a tangent and normal at any point on the hyperbola. [7M]

UNIT - II

3. a) The mid point of a straight line AB is 60mm above HP and 50mm in front of VP. The line measures 80mm long and inclined at 30° to HP and 45° to VP. Draw its projections. [7M]
- b) A rectangle ABCD of size 30 mm x 20 mm is inclined to the HP at 30° . Its shorter side AB is parallel to the HP and inclined at 45° to the VP. Draw the projections of the rectangle. [7M]

(OR)

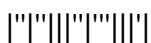
4. a) A line of 100mm long, makes an angle of 35° with HP and 45° with VP. Its mid point is 20mm above HP and 15mm in front of VP. Draw the projections of the line. [7M]
- b) A regular pentagon ABCDE of side 30mm has one of its edges parallel to the VP and inclined at 30° to the HP. The pentagon is inclined at 45° to the VP. Draw the projections [7M]

UNIT - III

5. Draw the projections of a cone, base 30mm diameter and axis 50mm long, resting on HP on a point of its base circle with (a) the axis making an angle of 45° with HP and its top view making an angle of 30° with VP. [14M]

(OR)

6. Draw the projections of a cube of 30mm long edges resting on the HP on one of its corners with a solid diagonal perpendicular to the VP. [14M]



UNIT - IV

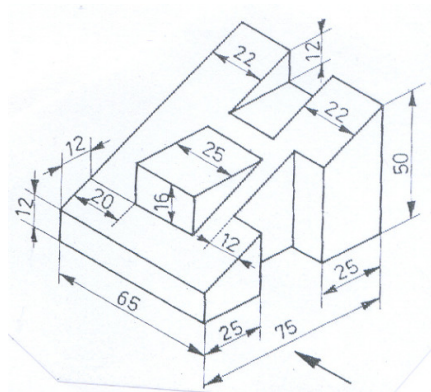
7. A pentagonal pyramid with edge of base 25mm and axis 65mm long is resting on HP on its base with an edge nearer to the observer, parallel to VP. It is cut by a section plane, inclined at 60° to VP and at a distance of 6mm from the axis. Draw the projections and obtain the true shape of the section. [14M]

(OR)

8. A cylinder of diameter of base 40mm and axis 55mm long is resting on its base on HP. It is cut by a section plane, perpendicular to VP and inclined at 45° to HP. The section plane is passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder. [14M]

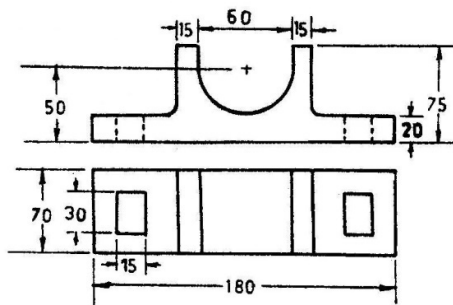
UNIT - V

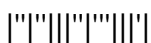
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UNIT - I

1. a) A tunnel on the Konkan Railway route has a size of 640 m x 10m x 10m. It is represented on a model by the volume of 27cm³. Find RF. Devise a diagonal scale of this RF to read up to 300 meters. Show the distances of 299meters, 171 meters and 9 meters on it. [7M]
- b) Construct a parabola with base 60mm and length of the axis 40mm. Draw a tangent to the curve at a point 20mm from the base. Also, locate the focus and directrix to the parabola. [7M]

(OR)

2. a) Construct a scale to measure km, 1/8 of a km and 1/40 of a km, in which 1 km is represented by 4 cm. Mark on this scale, a distance of 3.575 km. [7M]
- b) A fountain jet discharges water from ground level at an inclination of 50° to the ground. The jet travels a horizontal distance of 9m from the point of discharge and falls on the ground. Trace the path of the jet. [7M]

UNIT - II

3. a) A line AB of 100mm length is inclined at an angle of 30° to HP and 45° to VP. The point A is 15mm above HP and 20mm in front of VP. Draw the projections of the line. [7M]
- b) Draw the projections of a circle of 50mm diameter resting in the HP on a point A on the circumference, its plane inclined at 45° to the HP and the top view of the diameter AB making 30° angle with the VP. [7M]

(OR)

4. a) A line CD, 90mm long, measures 72mm in front view and 65mm in top view. Draw the two views of the line if it fully lies in the first quadrant. Find the true inclinations of the line. Point C lies at a distance 20mm from the reference planes. [7M]
- b) Draw the projections of a circle of 55 mm diameter resting in the VP on a point A on the circumference, its plane inclined at 45° to the VP and the diameter AB making 30° angle with the HP. [7M]

UNIT - III

5. A regular pentagonal pyramid, base 30mm side and height 75mm rests on one edge of its base on the ground so that the highest point in the base is 30mm above the ground. Draw its projections when the axis is parallel to the VP. Draw another front view on a reference line inclined at 30° to the edge on which it is resting so that the base is visible. [14M]

(OR)

6. A cylinder of 30 mm base diameter and 60 mm axis rests on HP with a point of its base such that the axis is inclined at 30° to HP and its axis of the plane inclined at 40° to xy. Draw its projections. [14M]

