

## GE3251 ENGINEERING GRAPHICS

### IMPORTANT QUESTIONS AND QUESTION BANK

1. Draw the locus of a point P moving so that the ratio of its distance from a fixed straight line  $DD'$   $\frac{3}{4}$ . Take the distance between the two fixed points is 70mm. Also draw tangent and normal to the curve from any point on it.
2. Construct an ellipse given the distance of the focus from directrix and 60mm and eccentricity as  $\frac{2}{3}$ . And also draw the tangent and normal to the curve at a point on it 20mm above the major axis.
3. Construct a parabola given the distance of the focus from the directrix as 50mm. and also draw the tangent and normal to the curve from any point on it.
4. Draw the locus of a point p moving so that the ratio of its distance from a fixed point. F to its distance from a fixed straight line  $DD'$  is 1. Distance on the focus from directrix is 50mm. also draw tangent and normal to the curve from any point on it.
5. Draw the parabola whose focus is at a distance of 60mm from the directrix draw the tangent and normal at 50mm from the directrix.
6. Construct a hyperbola when the distance between the focus and the directrix is 49mm. take eccentricity as  $\frac{4}{3}$ . Draw a tangent and normal at any point on the hyperbola.
7. A coin of 50mm diameter rolls along a straight line on a horizontal table without slipping. A point on the circumference of the coin is in contact with the table surface in the beginning and after one complete revolution. Draw the path traced by the point.
8. A circle of 40mm diameter rolls along the outside of another circle of 160mm diameter. Draw the tangent and normal to the curve at any point on the curve.
9. Draw the involute of a square of side 30mm also draw tangent and normal to the curve from any point on it.
10. A coir is unwound from a drum of 30mm diameter. Draw the locus of the free end of the coir for unwinding through an angle of  $360^\circ$ . Draw also the tangent and normal at any point on the curve.
11. A circle of 50mm diameter rolls along a straight line without slipping draw the curve traced by a point p on the circumference for  $3\frac{1}{4}^{th}$  revolution. Draw a tangent and normal on its 40mm from the base line.

12. Draw an epicycloid generated by a rolling circle of diameter 50mm and the diameter of the directing circle is 150mm also draw tangent and normal to the curve from any point on it.
13. Draw a hypocycloid generated by a rolling circle of diameter 50mm and the diameter of directing circle is 150mm. Also draw tangent and normal to the curve from any point on it.
14. Make the projections of the following points on common reference line, keeping the projectors 25mm apart.
  1. A, 25mm above HP and 35mm front of VP
  2. B, 25mm above HP and 40mm behind VP
  3. C, 30mm below HP and 45mm behind VP
  4. D, 30mm below HP and 40mm in front of VP
  5. E, 25mm above the HP and in VP
  6. F, 35mm below and in VP
  7. G, 25mm in front of VP and in HP
  8. H, 20mm behind VP and in HP
  9. U, on both HP and VP
15. A point p is on HP and 20mm in front of VP another point Q is also on HP and behind VP the distance between their end projectors is 60mm. Draw its projections if the line joining P&Q makes an angle of  $60^\circ$  with the reference line. Also find the position of the points P&Q.
16. A line AB is 85mm long has its end A 25mm away from the both reference planes and is in first quadrant the line is inclined at  $50^\circ$  to HP and  $30^\circ$  to VP. draw its projections
17. A line CD is 85mm long has its end C 25mm above the HP and 20mm in front of VP the end B is 60mm above HP and 50mm in front of VP draw the projections and find its inclination with HP and VP.
18. A straight line RS 85mm long has one end 15mm in front of VP and 10mm above HP, while the other end is 50mm in front of VP and 45mm above HP. Draw the plan and elevation of the line. determine the inclination of the line to HP and VP
19. The distance between the projections of two points A and B is 70mm. point A is 10mm above HP and 15mm in front of VP point B is 50mm above HP and 40mm in front of VP. Find the shortest distance A and B by rotating line method measure the true inclination with VP and HP
20. A line AB is 75mm long. A is 50mm in front of VP and 15mm above HP. B is 15mm in front of VP and is above HP. Top view of AB is 50mm long. Find the front view length and the true inclinations
21. A line PQ 65mm long has its end P in HP and 15mm in front of VP. The line is inclined at  $30^\circ$  to HP and  $60^\circ$  to VP. Draw the projections.

22. 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 an angle of  $30^\circ$  to HP and  $45^\circ$  to V. Draw the projections.
23. A line PQ has its end, 10mm above the HP and 20mm in front of the VP. The end Q is 35mm in front of the VP. The front view of the line measures 75mm the distance between the end projectors is 50mm draw the projection of line and find its true length and true inclination with VP and HP
24. The end P of a line is 15mm in front of the VP the line is parallel to the HP and inclined to the VP the elevation measures 40mm Draw the projections of the line and find the inclination of VP
25. One end P of a line PQ is in the HP and 20mm in front of the VP the line is parallel to VP and inclined at  $40^\circ$  to HP. The top view is 40mm find the true length of the line.
26. The end P of a line is PQ 70mm long is 15mm above the HP and 20mm in front of VP. Q is 40mm above the HP its plan inclined at  $45^\circ$  to the VP draw the projections of the line and find its true inclinations with VP and HP
27. A cube of side 40mm rests on the HP on one of its ends with a vertical face inclined at  $40^\circ$  to the VP draw its projections
28. Draw the top, front, right side views of a square pyramid of base side 30mm and altitude 40mm when it is resting on the ground on its base inclined at  $60^\circ$  to the VP.
29. A square prism of base edge 50mm and axis length 80mm is lying on the HP on one of its longer edges with its face equally inclined to the HP draw its top and front views when the axis is perpendicular to the VP.
30. A pentagonal pyramid of base of side 30mm and axis 60mm rest on the HP on one corner of the base one of the base edges containing which makes  $40^\circ$  with the HP. Draw the projections when the axis is perpendicular to the VP and the base is touching the VP
31. A hexagonal prism of base side 40mm and axis length 60mm lies on the HP on one of its longer edges with its axis parallel to both the HP and the VP one of the rectangular faces with containing the resting edge is inclined at  $30^\circ$  to the HP. Draw its top and front views.
32. A hexagonal prism of the base side 20mm axis length 50mm lies on the ground on one of its rectangular faces with the axis parallel to both of the HP and the VP Draw its projections
33. Draw the projection of a hexagonal prism of base side 20mm and axis length 50mm when it is lying on the ground on one of its rectangular faces and the axis is inclined at  $35^\circ$  to the VP
34. A square prism of base side 35mm and axis length 60mm lies on the HP on one of its longer edges with its faces equally inclined to the HP. Draw its projection when its axis is inclined at  $30^\circ$  to the VP.

35. A Cylinder of diameter 30mm and axis length 50mm resting on the HP on a point so that its axis is inclined at  $45^\circ$  to the HP. Draw its top and front views.
36. A cone base diameter 40mm and altitude 8mm rest on the HP with its axis inclined at  $30^\circ$  to the HP and parallel to the VP. Draw its front and top view.
37. A cone base side 60mm and altitude 70mm is freely suspended by means of a string from one of its base point with axis parallel to VP. Draw its projection
38. A cylinder of base side 50mm and altitude 70mm is freely suspended by means a string from one of its base point with axis parallel to VP. Draw its projections
39. A cube size of 25mm rest on the HP on one of its faces with a vertical face inclined at  $35^\circ$  to VP a plane perpendicular to the HP and parallel to the VP cut the cubes 10mm away from the axis and further away the VP Draw the top view and sectional front view
40. A cube is side of 25mm rest on the HP on one of its faces with a vertical face inclined at  $35^\circ$  to the VP A plane perpendicular to the HP and inclined at  $50^\circ$  to the VP cuts the cube 3mm away from the axis. Draw the top view and sectional front view
41. A cube of side 40mm is placed and cut by a plane in such a way that the true shape of the section is regular hexagon draw the front and top view of the cubes and determine the inclination of the plane with the HP
42. A square prism of base side 30mm and height 60mm rest on the HP on one its end with two of its rectangular faces equally inclined to the VP it is cut by a plane perpendicular to the VP and inclined at  $60^\circ$  to the HP meeting the axis at 15mm from the top draw the front view sectional top view and the true shape of the section
43. A hexagonal prism of base side 30mm and axis length 70mm rest on one its ends on the HP with two base sides parallel to the VP its cut by a plane perpendicular to the VP and inclined at  $30^\circ$  to the HP the cutting plane meet the axis at 30mm from the top draw the front view sectional top view and true shape of the section
44. A pentagonal prism of base side 40mm and axis length 80mm is lying on the HP one of its rectangular faces with its axis parallel to the both HP and the VP its cut by a plane perpendicular to the HP and inclined at  $30^\circ$  to the VP the cutting plane meet the axis at 16mm from one of its end draw the top view and sectional front view and true shape of the section
45. A hexagonal pyramid of base side 20mm and altitude 50mm rest on its base on the HP with two edges of the base perpendicular to the VP a cutting plane to the HP cuts the pyramid at a height of 20mm above the base draw the front view and sectional top view
46. A pentagonal pyramid of base side 20mm and altitude 55mm rest on its base on the HP with one of the base edges perpendicular to the VP its is cut by a

plane inclined at  $50^{\circ}$  to the base the cutting plane meet the axis at 15mm above the base draw the front view sectional top view and true shape of the section

47. A hexagonal pyramid of base side 25mm and axis 55mm rest on its base on the HP and two base edges perpendicular to the VP and at inclined at  $30^{\circ}$  to the HP meeting the axis at 20mm front of the vertex. Draw the front view sectional top view and the true shape of the section
48. A cone base diameter 40mm and height 50mm rest on its base on the HP it is cut by a plane perpendicular to the VP inclined at  $40^{\circ}$  to the HP the cutting plane meets the axis at 20mm from the vertex draw the sectional top view and true shape of the section
49. A pentagonal pyramid of base side 25mm and height 60mm is resting vertically on its base on the ground with a one of the sides of the base parallel to the VP its cut by a plane perpendicular to a VP and parallel to the HP at the distance 25mm at the base draw the development of the surface lateral surfaces of the frustum of the pyramid and also view of the cut surface
50. A right cone circular base diameter 60mm height 70mm is resting on its base on the ground its cut by a plane perpendicular to the VP and inclined at  $30^{\circ}$  to the HP the cutting plane bisects the axis of the cone draw the development of the lateral surface of the truncated cone
51. A cone base diameter 60mm and height 70mm resting on its base on the ground it is cut by a plane perpendicular to the VP and parallel to the HP at a distance 20mm from the vertex its is also cut by a plane inclined at  $40^{\circ}$  to the base and meeting the axis at a point 20mm above base draw the development of the lateral surface of the cut cone.
52. A hexagonal prism of base side 40mm and the axis length 70mm rest on one of its end to the HP with two base sides parallel to the VP its cut by a plane perpendicular to the VP and inclined at  $30^{\circ}$  to the HP the cutting plane meets the axis at 30mm from the top draw the isometric view and isometric projection
53. A pentagonal prism of base side 40mm and the axis length 80mm is lying on the HP on one its rectangular faces with its axis parallel to both the HP and VP its cut by a plane by perpendicular to the HP and inclined at  $30^{\circ}$  to the VP the cutting plane meet the axis with 16mm from one of its end draw the isometric view and isometric projection
54. A pentagonal pyramid base of side 20mm and altitude 55mm rest on its base on the HP with one of the base edge perpendicular to the VP its cut by a plane inclined at  $50^{\circ}$  to the base the cutting plane meet the axis at 15mm above the base draw the isometric view and isometric projection
55. A hexagonal pyramid of base side 25mm and axis 55mm rest on the HP with two base edges perpendicular to the VP its cut by a plane perpendicular to

- the VP and inclined at  $30^{\circ}$  at the HP meeting the axis at 20mm from the vertex draw the isometric view and isometric projection
56. A cylinder of diameter 40mm and height 50mm is resting on the vertically ends on the HP its cut by a plane perpendicular to the VP and inclined at  $30^{\circ}$  to the HP the plane meet the axis at a point 30mm from the base draw the isometric view and isometric projection
57. Draw the isometric view of cylinder of diameter 46mm and height 60mm when it is resting on one the end on the HP its cut by a perpendicular plane to the VP inclined at  $45^{\circ}$  on the HP the plane passes through a point on the axis located at 15mm from the top
58. Draw the isometric view of a frustum of cone of the bottom base diameter 60mm and the top face diameter 40mm and axis height 60mm
59. Draw the isometric view of frustum of a hexagonal pyramid when its resting on its base on the HP with two of the base edges parallel to the VP the side of the base is 20mm and top 8mm the height of the frustum is 55mm
60. A hexagonal pyramid of base side 20mm and height 60mm is resting vertically on its base on the ground with one of the sides of the base parallel to the VP. Its cut by a plane perpendicular to the VP and parallel to the HP at a distance 25mm above to base draw the isometric view and isometric projection of the frustum of pyramid
61. A hexagonal pyramid of base side 20mm and altitude 50mm rest on its base on the HP with two edges of the base perpendicular to the VP a cutting plane parallel to the HP at cuts a pyramid height of 20mm above the base draw the isometric view and isometric projection
62. A right base cone circular diameter 60mm and height 70mm is resting on base on the ground it is cut by a plane perpendicular to the VP and inclined at  $30^{\circ}$  to the HP the cutting plane bisects the axis of cone draw the isometric view and isometric projection of truncated cone
63. A cone base diameter 40mm and height 50mm rest on its base on the HP its cut by a perpendicular plane to the VP and inclined at  $40^{\circ}$  to the top the cutting plane meets the axis at 20mm from the vertex draw the isometric view and isometric projection
64. Draw the perspective view of a pentagonal prism of the base side 20mm and height 40mm when its rest on the base of the ground plane with the one of its rectangular faces parallel to 20mm to the left of the section point 45mm in front of PP and 60mm above the GP the observer is 20mm to the left of the axis use the top view and end view to draw the perspective visual ray method
65. A square prism base  $25 \times 25$  mm and height 40mm rest on the GP on one of its end with a rectangular faces receding away from the PP towards right making with  $60^{\circ}$  with PP draw the perspective view of the prism by visual ray method use top view and front view

66. A cylinder of diameter 40mm height 0mm rest on the GP on one its ends with axis 35mm behind the picture plane. The station point is 45mm to the right of the axis the station point is 65mm above the GP and 40mm in front of the PP. draw the perspective view of the cylinder by visual ray method.

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