

## ENGG GRAPHICS VIVA QUESTION ANSWERS

Q.1. What is meant by RF? What is the unit of RF.

Ans. The ratio of the length of the drawing to the actual length of the object is called the Representative fraction.

$$RF = \frac{\text{Length of the drawing}}{\text{Actual length of object}}$$

RF has no unit.

Q.2. Distinguish among full size, reduced size and enlarged sized drawing.

Ans. 1. When  $DL=AL$  Full size scale  $RF=1$

2.  $DL<AL$  reduced size scale  $RF<1$

3.  $DL>AL$  enlarged size scale  $RF>1$

Q.3 Which scale is used for two system of units in measurement.

Ans. Plane scale.

Q.4 What is the inclination of cutting plane in order to obtain

1. Parabola, 2. Ellipse, 3. Hyperbola, 4. Circle, 5. Triangle

Ans. 1. For parabola- The cutting should be parallel to any generator of the cone.

2. For Ellipse- The cutting plane should be inclined at an angle to axis cutting all the generator lines of cone.

3. Hyperbola- The cutting plane should not be parallel to any generator of cone and should not pass through axis.

4. for circle- The cutting plane should be parallel to the base of the cone and must cut all the generators.

5. for triangle- The cutting plane should cut the cone in two equal halves starting from the vertex.

Q.5. Give two practical applications of conic curves like parabola, ellipse and hyperbola.

Ans. Parabolic curves are used in arches, bridges, sound reflectors, light reflectors etc

Use of elliptical curves is made in arches, bridges, dams, monuments man holes glands, cookers(pressure) etc.

Use of hyperbolic curves is made in cooling towers, water channels etc.

Q.6. What is meant by an eccentricity? Define Parabola, ellipse and hyperbola.

Ans. The eccentricity is the ratio of distance of any point on the conic from focus to the distance of the same point from the directrix.

i.e eccentricity

'e' = Distance of any point of the conic from focus

Distance of same point from the directrix

For ellipse it is always less than 1

For parabola it is equal to one '1'.

For hyperbola, it is more than '1'.

Q.7. Define rectangular Hyperbola.

Ans. It is a curve traced out by a point moving in such a way that the product of its distances from two fixed lines at right angles to each other is a constant. The fixed lines are called asymptotes.

Q.8. What will be the path traversed by the bullet when it is shot in the air?

Ans. Parabola.

Q.9. Name the curve having zero eccentricity.

Ans. Circle.

Q.10. Name the curve having eccentricity more than 1.

Ans. Hyperbola.

Q.11. Differentiate between epicycloids and hypocycloid.

Ans. Epicycloids- The curve generated by a point on the circumference of a circle, which rolls without slipping along another circle outside it is called an epicycloids.

Hypocycloid- When the circle rolls along another circle inside it, the curve is called hypocycloid.

Q.12. Differentiate between Archimedean and logarithmic spiral.

Ans. Archimedean Spiral- It is a curve traced out by a point moving in such a way that its movement towards or away from the pole is uniform with the increase of the vectorial angle from the starting line.

Logarithmic or equiangular spiral- In a logarithmic spiral the ratio of the lengths of consecutive radius vectors enclosing equal angles is always constant. In other words the values of vectorial angles are in arithmetical progression and the corresponding values of radius vectors are in geometric progression.

Q.13. What is meant by projection? Define vertical horizontal and profile planes.

Ans. Projection- Projection is the visibility of the view of a solid or a line when seen from the top, front or side of it.

Vertical & Horizontal Planes- they are the planes which form the part of four quadrants.

Profile Plane- A plane which is perpendicular to both the Horizontal and the Vertical plane is called a profile plane.

Q.14. What is the projector?

Ans. The lines from the object to the planes are called projectors.

Projection- The figure formed by joining in correct sequence, the points at which these lines meet the plane, is called the projection of the object.

Q.15. What do you understand by orthographic projection, isometric projection, oblique projection and perspective projections?

Ans. (a) Orthographic Projections- When the projectors are parallel to each other and also perpendicular to the plane, the projection is called orthographic projection.

(b) Isometric Projection- In this method of projection, projection is obtained on the plane of paper when the projectors are parallel but inclined at an angle of 30degree to the plane of projection.

In isomeric projection the true length is reduced because of the inclination of x and y axis to 120degree. The length of the object is reduced by factor of 0.815 which is called isomeric scale. The dimensions of all elements are reduced by isometric scale in drawing of the object.

(c) Oblique Projection- the projection of an object on the plane of projection when one face of the object is parallel but the other adjacent face is inclined at an angle of 45degree to the plane of projection is called oblique projection. In this method of projection, x-axis and y-axis are same on paper whereas x-axis is inclined at an angle 45degree with x-axis.

(d) Perspective projection- In the perspective projection the projection of real object is obtained on an imaginary plane by viewing the object from the centre of projection. The view of the object is obtained by projecting points along the projection lines which meet the centre of projection and the view is obtained on an intermediate plane.

The Auto CAD package allows perspective views of the object by using a camera view angle of object.

Q.16. What do you mean by first angle and third angle projection systems?

Ans. (1) First angle projection:-

When the object is situated in the 1<sup>st</sup> quadrant i.e in front of the V.P and above H.P and then projected on these planes. This method of projection is known as first angle projection method. The object lies between the observer and the plane.

(2) Third angle projection system:-

When the object is situated in the third quadrant behind the V.P and below the H.P. The planes of projection are assumed to be transparent. They lie between the object and the observer. When the planes are brought in one line the front view is formed below xy line and the top view above xy line.

Q.17. Define elevation, plane and end view.

Ans. Elevation- is always formed on the V.P when viewed from the front.

Plan of Top View- is always formed on the H.P when viewed from the Top.

End view- End view is made on the left or right of elevation depending whether its view is from right or left on the object.

Q.18. What do you mean by four quadrants?

Ans. The planes fo projection are extended beyond the line of intersection to form four quadrants. The object maybe situated in any one of the quadrants.

Q.19. Normally projections are drawn in I<sup>st</sup> angle or III<sup>rd</sup> angle projection systems. Why not in II<sup>nd</sup> and IV<sup>th</sup> angle projection systems?

Ans. In case of II<sup>nd</sup> angle, both plan and elevation will overlap above reference line and in IV<sup>th</sup> angle projection system, the overlapping will take place below the reference line. In case of overlapping dimensioning is not feasible hence not followed.

Q.20. What do you infer when the top view and front view of a point are 15mm below the xy line?

Ans. The point is situated at 15mm below the HP and 15mm in front of V.P (i.e in 4<sup>th</sup> quadrant)

Q.21. Define line, plane and solid.

Ans. Line- Joining of shortest distance between two points forms a line.

Plane- Any surface in different shapes like square, circle, triangle, pentagon, hexagon with negligible or least thickness is called plane.

Two principle planes are horizontal plane and vertical plane.

Solid- Any shape made of any material having surface area, mass and volume is a solid. Eg.- Sphere, cube, cuboid, prisms, pyramids and cones etc

Q.22. What is the difference between true inclination of a line and apparent angles?

Ans. The angle which the true length of a line makes with HP or VP is true inclination. When a line is inclined to both the planes, its projections are shorter than the true length and inclined to xy at angles

greater than the true inclinations. These angles viz  $\alpha$  and  $\beta$  are called apparent angles of inclination.

Q.23. If front view of a line is a point, what will be its top view.

Ans. A line perpendicular to xy/reference line

Q.24. What do you mean by H.T and V.T of a line and a plane?

Ans. The points where the true lengths of a line inclined to H.P or V.P will meet H.P or V.P. When produced will be H.T and V.T respectively.

HT stands for horizontal traces.

VT stands for Vertical traces.

Traces of lines are points whereas traces of planes are lines.

Q.25. What is the difference in the shape of trace of a line and trace of a plane?

Ans. The trace of a line is a point whereas the trace of a plane is a line.

Q.26. Differentiate between the right and oblique solid.

Ans. The axis of a right solid is perpendicular to the base and solid is symmetrical about axis. Whereas oblique solid is not symmetrical about its axis.

Q.27. What do you mean by right & regular prism, Pyramid cone and cylinder?

Ans. Right means axis vertical & perpendicular to base & regular means all sides equal.

Q.28. What is the difference between prism and pyramid.

Ans. Prism-

A prism has two horizontal bases of equal sides according to name of polygon and number of vertical rectangular faces equal to the number of sides in the top and bottom faces.

Eg.- Pentagonal prism will have 5 equal sides in the base & top and 5 nos of equal vertical rectangular faces.

Pyramid-

In a pyramid the number of sides in the base & number of isosceles triangles are equal. Height is equal to height of axis.

Q.29. What is the difference between cone & cylinders?

Ans. Cylinder-

A cylinder has two circles, one each at the base & top with an axis joining their centers.

Cone-

A cone has one circular base and one vertex at the top with axis joining vertex and centre of base circle.

Q.30. What do you mean by generator of a cone?

Ans. Cone is made of number of generator lines. All the lines joining vertex to the circular base are generator.

Q.31. What is the difference between frustum of a cone and truncated cone.

Ans. When the cutting plane is parallel to the base and Perpendicular to axis it gives a frustum and when the cutting plane is inclined at an angle to the axis it gives a truncated cone.

Q.32. Differentiate between cube, cuboids and a square prism.

Ans. A cube has six faces all equal squares.

Square Prism or Cuboids- This has two square and equal faces called its ends or bases parallel to each other and joined by other four faces which are rectangles. The imaginary line joining the centers of the bases is called the axis.

Q.33. What are auxiliary planes? What is the use of auxiliary planes?

Ans. Plane perpendicular to both the principle planes is called auxiliary plane. Side views of the objects are taken on it.

Q.34. What is the advantage of sectional view?

Ans. It reveals interior features of a part.

Q.35. Why a section of machine part is taken?

Ans. To see the internal features of the part.

Q.36. Define apparent shape of a section and true shape of a section.

Ans. True shape is available on a face parallel to cutting plane whereas apparent shapes are smaller in area and are available on plan and elevation of the object.

Q.37. State a few practical applications of development of surfaces.

Ans. Different types and sizes of funnels and ducts for air conditioning plants can be easily designed and manufactured.

Q.38. Name the method used for obtaining the developments of prisms and cylinders.

Ans. Parallel-line development method.

Q.39. Name the method used for obtaining the development of cones and pyramids.

Ans. Radial-line development method.

Q.40. Name the method used for obtaining the development of sphere.

Ans. Approximate method.

Q.41. Differentiate between isometric projection and isometric view.

Ans. The view drawn with the true scale is called isometric drawings of isometric view, while those drawn with the use of isometric scale is called isometric projections.

Q.42. Name the method preferred for drawing ellipse in isometric projection.

Ans. Four centre method.

Q.43. What is meant by isometric scale?

Ans. The ratio,

$$\frac{\text{Isometric Length}}{\text{True length}} = \frac{\sqrt{2}}{\sqrt{3}} = 0.815 \text{ or } 9/11(\text{approx.})$$

Q.44. What are the standard specifications of drawing sheets and pencils.

Ans. A0, A2, A3, A4

H, 2H, 3H, 4H etc- 2,3,4 shows increase in hardness.

B, 2B, 3B, 4B - 2,3,4 shows increase in softness.

Q.45. Name the different types of lines used in engineering drawing.

Ans. The different types of lines are:-

0.2mm Medium- Outlines, dotted lines, cutting plane lines

0.1mm Thin line- Centre lines, section lines, dimension lines, extension lines, construction lines, leader lines, short break lines and long break lines.