



ST.ALOYSIUS INSTITUTE OF TECHNOLOGY, JABALPUR
DEPARTMENT OF MECHANICAL ENGINEERING
SUBJECT- ENGINEERING GRAPHICS (B.E-105)
PRACTICAL VIVA QUESTIONS & ANSWERS

Q 1- What do you Mean by R.F.? What is The Unit of R.F.?

Ans: - The Ratio of length of the drawing to the actual length of the object is called The Representative Fraction (R.F).

$$\text{R.F.} = \frac{\text{Drawing Length}}{\text{Actual Length}}$$

R.F is unitless.

Q 2- Distinguish Among Full Size, Reduced Size & Enlarged Sized Drawing

Ans: - 1-When $DL = AL$ Full Size Scale $R.F = 1$
2- $DL < AL$ Reduced Size Scale $R.F < 1$
3- $DL > AL$ Enlarged Size Scale $R.F > 1$

Q 3- Which scale is used for two system of Units 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- Parabola - The Cutting Should be parallel to Any Generator of The Cone.

Ellipse- The Cutting Plane Should Be Inclined At An Angle To Axis Cutting All The Generator Lines of Cone.

Hyperbola- The Cutting Plane Should Not Be Parallel To Any Generator of Cone & Should Not Pass through Axis

Circle- The Cutting Plane Should Be Parallel To The Base of The Cone & Must Cut All The Generators.

Triangle- The Cutting Plane Should Cut The Cone in Two Equal Halves Starting From The Vertex.

Q 5- Gives Two Practical Applications Of Conic Curves Like Parabola, Ellipse And Hyperbola.

Ans- Parabola - Parabolic Curves Are Used in Arches, Bridges, Sound Reflectors, Light Reflector, etc.

Ellipse- Use of Elliptical Curves is made in Arches, Bridges, Dam, Mountains, Man Holes Glands, Cookers (Pressure) Etc.

Hyperbola- 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.

$$\text{Eccentricity} = \frac{\text{Distance of Any Point on the Conic from Focus}}{\text{Distance of the Same Point from the Directrix}}$$

For Ellipse it is Always Less Than 1

For Parabola it is Always Equal to 1

For Hyperbola it is More Than 1



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Q 7- Defines Rectangular Hyperbola?

Ans- It is Curves 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 constant. The fixed lines are called asymptotes.

Q 8-What Will 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 B/W Epicycloid And Hypocycloid?

Ans- Epicycloid - The Curve Generated By a Point on the Circumference of A Circle, Which Rolls Without Slipping Along another Circle Outside. It is called an Epicycloid
Hypocycloid- When the Circle Rolls along another Circle inside it, The Curves is Called Hypocycloid.

Q 12- Differentiate B/W Archimedean and Logarithmic Spiral

Ans- Archimedean Spiral- It is curves traced out by a point moving in such a way that it's movement towards or away from the pole is uniform with the increase of vertical angle from the starting line.

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

Q 13- What is meant By Projection? Define Vertical, Horizontal & 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 – are the plane which from the part of Four Quadrants.

Profile Plane – A Plane Which Is Perpendicular To Both The Horizontal & The Vertical Plane Is Called 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 objects.

Q 15- What do you understand by orthographic projection, isometric projection, oblique projection & perspective projections?

Ans- A) Orthographic Projection –When the projector is parallel to each other and also perpendicular to the plane, the projection is called Orthographic Projection.



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B) Isometric Projection –In this method of projection, projection is obtained in the plane of paper when the projectors are parallel but inclined at an angle of 30° to the plane of projection.

In Isometric Projection the true length is reduced because of the inclination of x and y axis to 120° . The length of the object is reduced by factor of 0.815 which is called isometric scale. The dimension of all element 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 adjacent face is inclined at an angle of 45° to the plane of projection is called oblique projection. In this method of Projection X-Axis and Y-Axis are same on Paper Whereas Z-Axis Inclined at an Angle 45° 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 object is obtained by projecting points along the projection line which meet the centre of projection and the view is obtained on an intermediate plane. The AutoCAD packages allow perspective views of the object by using a camera view and angle of object.

Q 16- What Do Mean By First Angle And Third Angle Projection Systems?

Ans- 1) First Angle Projection –When the object is situated in the first quadrant that is in front of V.P. and Above H.P. and then projected on these planes .this method of projection is known as 1st angle projection method. The object lines between the observer and the planes.

2) Third Angle Projection System – When the object is situated in the 3rd quadrant behind the V.P. and Below the H.P. the plane 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- Defines Elevation, Plan & End View?

Ans- Elevation – It is always formed on the V.P When viewed from the front.

Plan Or Top View – It is always formed on The H.P When viewed from the Top.

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

Q 18- What do you mean by Four Quadrants?

Ans – The planes of projection are extended beyond the line of inter section from four quadrants. The object may be situated in any one of the quadrants.

Q 19- Normally Projections Are Drawn In 1st Angle Or 3rd Angle Projection Systems. Why Not is 2nd Angle & 4th Angle Projection Systems?

Ans- In Case Of 2nd Angle Both Plan & Elevation Will Overlap Above Reference Line & In 4th Angle Projection System, The Overlapping Will Take Place Below The Reference Line. In Case Of Overlapping Dimensions Is Not Feasible, Hence Not Followed.

Q 20- What Do You Infer When The Top View & Front View Of A Point Are 15mm Below The XY Line ?

Ans- The Point Is Situated At 15mm Below The H.P. & 15mm Infront Of V.P. (i.e. In 4th Quadrant).



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Q 21- Defines Line, Plane & Solid?

Ans- Line- Joining of shortest Distance B/W two points forms A Line.

Plane- Any Surface In Different Shape Like Square, Circle, Triangle, Pentagon And Hexagon With Negligible Or Least Thickness Is Called Plane.

Two Principle Planes Are Horizontal Plane & Vertical Plane.

Solid-Any Shape Made Of Any Material Having Surface Area, Mass & Volume Is A Solid.
Examples- Sphere, Cube, Cuboid, Prism, Pyramids & Cones etc.

Q 22-What is The Difference B/W True Inclination of a Line and Apparent Angles?

Ans- The Angles Which The True Length Of A Line Makes With H.P or V.P Is True Inclination. When A Line Is Inclined To Both The Planes, Its Projection Are Shorter Than The True Length & Inclined To XY At Angles Greater Than The True Inclination. These Angles Viz .Alpha & Beta are Called Apparent Angles of Inclination.

Q 23- If Front of a Line is A Point, What Will be its Top View.

Ans- A Line Perpendicular to XY/ Reference Line.

Q24- What Do You Mean By H.T & V.T Of A Line & A Plane?

Ans – The Point Where the True Lengths of a Line Inclined To H.P or V.P Will Meet H.P & V.P When Produced Will Be H.T & V.T Respectively,

H.T Stands For Horizontal Trace,

V.T Stands For Vertical Trace

Trace of a Lines Are Points Whereas Traces of Planes Are Lines

Q25- What is the Difference in The Shape of Trace of a Line & Trace of a Plane?

Ans- The Trace of a Line is a Point; Whereas the trace of a plane is a line.

Q26- Difference B/W the Right & Oblique Solid?

Ans- The Axis Of A Right Solid Is Perpendicular To The Base & Solid Is Symmetrical About Axis. Whereas Oblique Solid is Not Symmetrical about Its Axis.

Q27- What Do You Mean By Right & Regular Prism, Pyramid Cone & Cylinder?

Ans- Right Means Axis Vertical & Perpendicular To Base & Regular Means All Sides Equal.

Q28- What Is Difference B/W 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 No. of Sides in the Top & Bottom Faces.

Examples - Pentagonal Prism Will Have 5 Equal Sides in the Base & Top & 5 No. 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.



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Q 29- What is Difference B/W Cone & Cylinder?

Ans- Cylinder – A Cylinder Has Two Circles, one each at The Base & Top with an Axis Joining Their Centres.

Cone – A Cone Has One Circular Base & One Vertex At The Top With Axis Joining Vertex & Centre Of Base Circle.

Q 30- What Do Mean By Generator Of 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 B/W Frustum of a Cone & Truncated Cone?

Ans – When The Cutting Plane Is Parallel To The Base & 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- Differentiates B/W Cube, Cuboid and a Square Prism.

Ans- Cube- A Cube Has Six Faces All Equal Squares.

Square Prism Or Cuboid – This Has Two Square & Equal Faces Called Its Ends Or Bases Parallel To Each Other & Joined By Other Four Faces Which Are Rectangles. The Imaginary Line Joining The Centre 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 Principal 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 Is Taken

Ans- To See the Internal Features of the Point

Q 36- Defines Apparent Shape Of A Section & True Shape Of A Section.

Ans- True Shape Is Available On A Face Parallel To Cutting Plane Where Apparent Shapes Are Smaller In Area & Are Available On Plan & Elevation Of The Object.

Q 37- States A Few Practical Application Of Development Of Surfaces?

Ans- Different Type & Sizes Of Funnels & Ducts For Air Conditioning Plants Can Be Easily Designed & Manufactured.

Q 38- Name The Method Used For Obtaining The Developments Of Prisms & Cylinders.

Ans- Parallel- Line Development Method.



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Q 39- Name The Methods Used For Obtaining The Development Of Cones & Pyramids.

Ans- Radial- Line Development Method.

Q 40- Name The Method Used For Obtaining The Development Of Sphere.

Ans- Approximate Method

Q 41- Differentiates B/W Isometrics Projection And Isometrics View?

Ans- The View Drawn with the True Scale is Called Isometric Drawing Or Isometric View While That Drawn With The Use Of Isometric Scale Is Called Isometric Projection.

Q 42 – Name the Method Preferred For Drawing Ellipse In Isometric Projection.

Ans - Four Centre Method

Q 43- What Are Standard Specifications Of Drawing Sheet's And Pencils?

Ans- A₀, A₁, A₂, A₃, A₄

H, 2H, 3H, 4H etc

B, 2B, 3B, 4B etc

Q44 – Name The Different Types Of Line Use In Engg. Drawing?

Ans- 1)-0.2 Mm Medium- Outlines, Dotted Lines, Cutting Plane Lines

2)- 0.1 Mm Thin – Centre Lines, Section Lines, Dimension Lines, Extension Lines, Construction Lines, Leader Lines, Short Break Lines And Long Break Lines.