Scales

Q1. Define R.F.?

Ans: Representative Fraction (R.F.) is measure of reduction or enlargement of dimensions of an object while drawing. It is defined as ratio of Length of drawing to Actual length of object, both measured in same units. Being a ratio, R.F. is unit less.

Q2. How will you find L.O.S?

Ans: Length of Scale (L.O.S) is calculated by multiplying R.F. with maximum length. Length of scale will bear same unit as that of maximum length.

Q3. How many types of scales are used in Engineering Drawing?

Ans. The scales generally used in Engineering Drawing are

1. Plain Scale
2. Diagonal scale
3. vernier Scale
4. Scale of chords

Some other scales are

1. Isometric Scale
2. Logarithmic Scale etc.

Q4. What is the difference between Plain Scale and Diagonal Scale?

Ans. A Plain scale represents two consecutive units, where as diagonal scale represents three consecutive units.

Q5. What is scale of chords and why it is called so?

Ans. Scale of chord is the scale drawn to measure angles. It is used to draw and measure angles without using protractor. It is called so because we draw a series of chords which subtend known angle at the centre of circle of known diameter.

Q6. What is RF of scale of chords?

Ans. It is unity.

Q7. How will you measure given angle using scale of chords?

Ans. First we have to draw an arc of radius equal to that of scale of chord, with vertex as centre. Then we have to take intercept in the divider and compare it with the known chords to find the measurement of given angle.

Q8. How will you draw given angle using scale of chords?

Ans. First we have to draw a line segment of any arbitrary length. We have to mark one of its end as vertex for drawing the angle. Then we have to set radius equal to length of 60º chord in the rounder, and to draw an arc with vertex as centre. Measure the chord of angle to be drawn and mark it on the arc. Join the ends of chords with the vertex.

Curves

Q1. What are conic sections and why are they called so?

Ans. Ellipse, parabola and hyperbola are called conic sections because these curves appear on the surface of a cone when it is cut by some typical cutting planes.

Q2. Define eccentricity?

Ans. It is the ratio of distance of any point on the curve from a fixed point called focus to, its distance from a fixed line called directrix. I is constant for the given curve.

Q3. Define Ellipse?

Ans. It is locus of a point moving in a plane in such a way that ratio of its distance from a fixed point to its distance from a fixed line always remains constant and is less than one.

It is locus of a pint moving in a plane in such a way that sum of its distance from two fixed points (called foci) always remain constant and is equal to major axis of the ellipse.

Q4. Name the methods to draw an ellipse?

Ans.
1. General Method
2. Arc of circle method
3. Rectangle or oblong method
4. Concentric circle method

Q5. Define Parabola?

Ans. It is locus of a point moving in a plane in such a way that ratio of its distance from a fixed point is always equal to its distance from a fixed line. In other words its eccentricity is always equal to one.

Q6. Name the methods to draw Parabola?

Ans.
1. General Method
2. Rectangle method
3. Tangent or triangle method

Q7. Define Hyperbola?

Ans. It is locus of a point moving in a plane in such a way that ratio of its distance from a fixed point to its distance from a fixed line always remains constant and is greater than one.

It is locus of a pint moving in a plane in such a way that difference of its distance from two fixed points (called foci) always remains constant and is equal to transverse axis of the hyperbola.

Q8. Name the methods to draw Hyperbola?

Ans.
1. General Method
2. Arc of circle method
3. orthogonal asymptotes method

Q9. What is rectangular Hyperbola?

Ans. When the asymptotes of the hyperbola are at right angles to each other it is called rectangular Hyperbola. Eccentricity of rectangular hyperbola is $\sqrt{2}$.

Q10. What is the significance of normal and tangent on a curve?

Ans. When force is applied on any point of the curve, we are more concerned with its two components, perpendicular to the curve and along the curve. That's why we are interested in normal and tangent on the curve.

Q11. What are the methods to draw normal and tangent on conics?

Q12. What are cycloidal curves?
Ans. It is locus of a point on the circumference of the circle which rolls on a straight line or curved path, without slipping.

Q13. Define Cycloid?
Ans. It is locus of a point on the circumference of the circle which rolls on a straight line, without slipping. The straight line is called directing line and the circle is called rolling or generating circle.

Q14. Define Epicycloid?
Ans. It is locus of a point on the circumference of the circle which rolls on another circle and outside it , without slipping. The fixed circle is called directing circle and the moving circle is called rolling or generating circle.

Q15. Define Hypocycloid?
Ans. It is locus of a point on the circumference of the circle which rolls on another circle and inside it , without slipping. The fixed circle is called directing circle and the moving circle is called rolling or generating circle.

Q16. What property of cycloidal curves is used to draw normal and tangent on the curve?
Ans. When the circle starts rolling on a straight line or curved path, and the point on its circumference starts tracing the curve, at any given position, line joining the point of contact of circle to the position of the point is always normal on the curve.

Q17. What are the applications of cycloidal curves?
Ans. Cycloidal curves are used in gear teeth profiles.

Q18. What are trochoids?
Ans. It is locus of a point on the circle (but not on the circumference) which rolls on a straight line or curved path without slipping.

Q19. What is equiangular spiral and why it is called so?
Ans. In a Logarithmic spiral, angle between radius vestor and tangent at any point is always constant. That is why it is known as *equiangular spiral.*

Q20. what are applications of conic sections?
Ans. *Ellipse* is used in concrete arches, stone bridges, dams monuments, manholes, glands, stuffing boxes etc.

Parabola: many bridges use parabolic supports like Howrah Bridge, Golden Gate Bridge. It is also used in reflectors of torches and headlamps. It is also use in giant mirrors, reflecting telescopes and antennas to collect light and radio signals from outer space and focus them at the focal point.

Hyperbola is used in water channels, cooling towers, skew gears. Hyperbolic reflectors are used in Long Range Navigation.

Orthographic projections

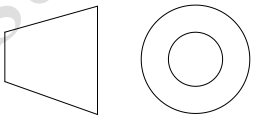
Q1.What is orthographic projection and why it is called so?

Ans. An *orthographic projection* is called so because projectors drawn from the corners of an object are parallel to each other and perpendicular to the plane of projection.

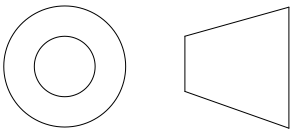
Q2.What is the difference between first angle projection and third angle projection?

	First Angle Projection	Third Angle Projection
1	The object is placed in the first quadrant i.e. above the H.P. and in front of the V.P.	The object is placed in the third quadrant i.e. below the H.P. and in behind the V.P.
2	The object lies between plane and observer.	The plane lies between the object and the observer.
3	The plane of projection is assumed to be non-transparent.	The plane of projection is assumed to be transparent.
4	In this projection, considering the F.V as reference, L.S.V. of object is drawn on its right, R.S.V. is drawn on its left and T.V. is drawn below it.	In this projection, considering the F.V as reference, L.S.V. of object is drawn on its left, R.S.V. is drawn on its right and T.V. is drawn above it.

Q3. What is symbol of first angle projection?



Q4 What is symbol of third angle projection?



Q5 What do you mean by elevation?
Ans. Elevation means front view.

Q6 What do you mean by plan?
Ans. Plan means Top view.

Projection of Straight Lines

Q1. What are traces of a straight line and how are they located?

Ans. The points of intersection of the straight line with the principal planes (H.P. and V.P.), on extension or without extension are known as the Horizontal Trace and Vertical Trace respectively.

They are located by extending the F.V. and T.V (if required). The point of intersection of the F.V. with ***xy*** line gives the F.V. (***h'***) of the ***H.T.*** Intersection of the projector of the ***h'*** with the T.V. of the line or its extension gives the ***h.***

Similarly, the point of intersection of the T.V. with ***xy*** line gives the T.V. (***v***) of the ***V.T.*** Intersection of the projector of the ***v*** with the F.V. of the line or its extension gives the ***v'***

Q2. What is the difference between true inclination and apparent inclination?

Projection of Planes

Q1. What do you mean by oblique plane?
Ans. If
Q2. Describe the strategy to draw projections of an oblique plane?
Q3. What is auxiliary plane?
Q4. How will you classify auxiliary planes?
Q5. What do you mean by A.I.P.?
Q6. What do you mean by A.V.P.?
Q7. What do you mean by P.P.?
Q8. How auxiliary planes are represented?

Projection of solids

Q1. What is the difference between frustum of solid and truncated solid?
Q2. What do you mean by right solid?
Q3. What is the difference between prism and pyramid?

Section of Solids

Q1. How cutting planes are represented?
Q2. What is the significance of section of solid?

Development of surfaces of solids

Q1. What do you mean by Development of solid?
Q2. Classify the methods of development of solids?
Q3. What are the methods for development of sphere?
Q4. What do you mean by Antidevelopment?
Q5. What is parallel line method and when it is used?
Q6. What is radial line method and when it is used?
Q7. What is triangulation method and when it is used?
Q8. what are approximate methods and on which solids these are used?
Q9. What is zone method?
Q10. What is lune method?

Isometric Projections

Q1. What is the difference between isometric view and isometric projection?

Q2. What are the advantages of isometric projections?
Q3. How will you draw isometric projection of sphere?
Q4. Define Isometric projection?
Q5. What are the advantages of isometric drawing over isometric projections?
Q6. How will you draw orthographic projections of a regular tetrahedron?
Q7. What do you mean by isometric axes?
Q8. What do you mean by isometric planes?

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Engineering Drawing
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Short Questions