ENGINEERING DRAWING

2MARKS

1. Define engineering drawing. Why drawing is called universal language of engineers?
Ans1:-A drawing drawn by an engineer having engineering knowledge for the drawing purposes is an engineering drawing. It is meant for communicating his ideas, thoughts and designs to others. Engineering drawing is a starting point of all engineering branches such as Mechanical, Production, Civil, Electrical, Electronics, Computer science, Chemical etc. It is spoken, read, and written in its own way. Engineering drawing has its own grammar in the theory of projections, its idioms in conventional practices, its punctuations in the types of lines, its abbreviations, symbols and its descriptions in the constructions.

Q2 - Name different types of drawing instruments.
Ans2 – Drawing board, T-square, Set Square, Scales, Pencil and sand paper block, Drawing pins or cello-tape ,Duster or handkerchief, eraser etc.

Q3 – Why pencil is rotated in finger while drawing a long line?
Ans3 – The pencil is rotated in finger while drawing a long line in order to get a line of uniform thickness throughout.

Q4 – What are the standard sizes of drawing sheets according to I.S.I. and which is suitable for drawing work?
Ans5 –The standard size of sheets according to I.S.I. are
A0(1189 X 841), A1 (841 X 594), A2(594 X 420),A3(420 X 297), A4(297 X 210) and A5 (210 X 148). Drawing sheet of size 594 X 420 i.e. A2 size is generally used by engineering students as it is very handy and easy for drawing work in class.

Q6 – What are the ways of sharpening a pencil for good and accurate work and which type of pencil is more suitable for drawing work?
Ans6 – There are two ways of sharpening a pencil (i) a small piece of sand paper of zero grade, pasted upon a piece of wood. (ii) Sharpeners. Usually hard pencils such as H, 2H etc are used for making the engineering drawing.
Q7 – What should be the grade of pencil used for lettering?
Ans – HB and H grade pencils sharpened to a conical point should be used for lettering. To keep the stroke of the letters uniform, the pencils should be rotated between the thumb and fingers while lettering. Hard pencils such as 2H or 3H should be used to draw guidelines.
Q8 – What is the importance of dimensioning?
Ans1) Dimensioning expresses all the sizes and other information necessary to define the object
.2) It must be done with due regard to manufacturing processes and inspection requirements.
3) The dimensioning also includes expression of tolerances necessary for the correct functioning of the part given to be assembled.
Q9 – What is dimensioning?
Ans –The art of writing the various sizes or measurements on the finished drawing of an object is known as dimensioning.

Q10– Explain with the help of a simple sketch (i) size dimensions (ii) location dimensions.
Ans Size dimension –The dimensions which indicate the various sizes of the object such as length ,breadth, diameter etc. are known as size dimensions. These dimensions are represented by letter 'S'.Figure.
Location dimension –
The dimensions which locate the position of one feature w.r.t. the other feature are known as location dimensions. Distances between the centre lines of the holes from the edges are given by location dimensions. These dimensions are marked by letter 'L'.Figure.
Q11 – What is the difference between a quadrilateral and a polygon?
Ans42 –

Quadrilateral –
A quadrilateral is a plane figure bounded by four straight lines and containing four angles.
Polygon –
A polygon is a plane figure bounded by more than four straight lines and containing more than four angles.
Q12 – What is the difference between a parallelogram and a rhombus?
Ans43 –

Parallelogram –
A parallelogram is a quadrilateral in which the opposite sides are equal and parallel.
Rhombus –
A rhombus is a quadrilateral in which all the sides are equal and the angles are not right angles .However, in this case the opposite angles are equal.
Q13 – What is the difference between regular and irregular polygons?
Ans44 –

Regular polygon –
A regular polygon is a plane figure in which all the sides and angles are equal.
Irregular polygon –
An irregular polygon is a plane figure in which all the sides and angles are not equal.
Q14– Name the principal planes of projections.
Ans45
:-There is two planes employed for projection and are known as reference planes or principle planes of projections. These planes intersect at right angles to each other. These are
1) Vertical plane
: - The plane which is vertical is called vertical plane and is denoted by V.P. Vertical plane is also known as Frontal Plane as front view is projected on this plane.
2) Horizontal plane
:-The plane which is horizontal and at right angle to the V.P is called Horizontal Plane and it is denoted by H.P.
Q15:- What is the principle of projection?
Ans46
:-If straight lines are drawn from various points on the contours of an object to meet a plane, the object is said to be projected on that plane. The figure formed by joining in correct sequence the points at which these lines meet the planes is called the projection of the object.
Q16 – What is ground line (G.L.) or intersection or reference line?
Ans47:-

The line of intersection of two principle planes of projections i.e. VP and HP is called reference or intersection or ground line and is denoted by x-y line.

Q17 – What is an auxiliary view?

Ans

The view obtained on the auxiliary plane which is parallel to the inclined surface of an object is called auxiliary view.

Q18 – What is a sectional view? Why sectional views are used in drawing?

Ans The view obtained after cutting the object in order to show the inner details by an imaginary cutting plane is known as sectional view. Sectional views are used in drawing to show the interior details of the object ,which are not visible to the observer from outside.

Q19 – What is a cutting plane or section plane?

AnsThe imaginary plane by which the object is assumed to be cut is called the cutting plane or sectional plane. They may be perpendicular or parallel to one of the principle planes and either perpendicular or inclined to the other plane. These planes are represented by their traces.

Q20 – What are section or hatching lines?

Ans The lines used to represent the material which has been cut by the cutting plane are called section lines. They are also called hatchings or crosshatchings. These are equally spaced lines inclined at 45º to the horizontal.

Q21 What do you mean by sections of solids?

Ans the solids which are cut by the section planes to visualize the internal constructional details of the invisible features are known as section of solids.

Q22 What is apparent section?

Ans The projection of the section on the plane to which it is inclined is called as apparent section.

Q23 What is true section?

Ans The projection of the section on a plane parallel to the plane will show the true shape of the section.

Q24 How will you classify sections of solids? Or What are the different positions of a section plane w.r.t. two reference lines? Or What are the types of sections of solids?

Ans 1) Section of solids obtained by horizontal planes.2) Section of solids obtained by vertical planes.3) Section of solids obtained by auxiliary inclined planes.4) Section of solids obtained by auxiliary vertical planes.5) Section of solids obtained by profile plane.

Q25 What do you understand by V.T. and H.T. of section plane?

Ans Horizontal trace (H.T)

– H.T. of a section plane is a line in which the plane meets the H.P.

Vertical trace (V.T.) –

V.T. of a section plane is a line in which the plane meets the V.P.

Q26 What do you mean by Frustum?

AnsWhen the section plane is parallel to the base plane of a cone or pyramid, it will form a frustum.

Q27 What do you mean by truncated?

Ans When the section plane is inclined to the base plane of a solid, it will form a truncated.

Q28 What do you understand by intersection of surfaces?

Ans The lines or curves which are formed when surfaces of two solids intersect with each other are known as intersection of surfaces or interpenetration of solids.

Q29 What are the lines or curve of intersection or interpenetration?

Ans When a solid penetrates into another solid, their surfaces meet in a line called the line or curve of intersection or interpenetration.

Q30 Name the methods of plotting the lines of intersection or inter-penetration of solids?

Ans Line method or piercing point method2) Cutting plane method

Q31 How will you classify the intersecting surfaces?

Ans 1) the intersection of plane surfaces2) The intersection of two curved surfaces3) The intersection of a plane surface and a curved surface

Q32 what do you mean by development of surfaces?

Ans A layout of the complete surface of a three dimensional object on a plane surface is called its development or pattern.

Q33:- What is stretch out or girth line?

Ans The stretch out or girth line is the length of the pattern or development and is given by the perimeter of the object measured in a plane at right angles to the axis. This term is used in patterns of objects having a constant cross section for their full length. e.g. prisms and cylinders.

Q34 What is the principle of development?

AnsThe development is based on the principle which indicates that every line on the development must show the true length of the corresponding line on the surface of the object for which development is required.

Q35 What are the different methods of development of surfaces?

Ans 1) Parallel line development2) Radial line development3) Triangulation development4) approximate method

Q36 Why the true lengths of slant edges are determined?

The true length of slant edges are determined because every line on the development must show the true length of the corresponding line on the surface of the object to be developed.

Q37 What are the applications of development of surfaces?

Ans It is used in the fabrication of simple to highly complicated shapes from flat surfaces in sheet metal shops, in the construction of boilers, pattern making, tunnels, buckets, chimney etc.

Q38 What is a point?

Ans A point is that which has simply position but no magnitude. It is generally represented by a very small circle or dot.

Q39 What do you mean by octants?

Ans When the three planes i.e. H.P., V.P. and P.P. divide the entire space into eight quadrants, then these quadrants are known as octants.

Q40 What is the difference between first angle and third angle projection? Which angle projection is recommended by B.I.S. now a days? Or what are the types of orthographic projections?

Ans 1)First angle projection:-

In this projection the object is assumed to be situated in first quadrant, i.e. in front of V.P and above HP the projections obtained on these planes is called first angle projection. The symbol for the first angle projection is Figure.

Third angle projection: -

In this Projection the object is assumed to be situated in the third quadrant that is below HP and behind VP .The front view comes below the XY line and the top view above it. The symbol for the third angle projection is
Now a day we are working with first angle projection because it is recommended by the B.I.S and it is adopted by almost all the countries of the world since 1983.Figure.

Q41 Why the projections of an object is not drawn in second and fourth quadrants?

Ans The projections of an object is not drawn in second and fourth quadrants because the overlapping will take place. It will become very difficult to understand the views.

Q42When the auxiliary planes are used?

Ans The auxiliary planes are used in order to view the true shape of an inclined surface. The projection drawn on the auxiliary plane is known as the auxiliary view and gives the true shape of the inclined surface.

Q43What are the types of auxiliary planes?
Ans The plane placed at any angles to the principle planes is called auxiliary plane. Auxiliary planes are of two types.1)

Auxiliary vertical plane (A.V.P.)
:-It is perpendicular to the HP and inclined to the VP. Projection on an AVP is called auxiliary front view.
2)Auxiliary inclined plane (A.I.P.)
:-It is perpendicular to the VP and inclined to the HP. Projection on AIP is called auxiliary top view.
Q44 Define a straight line.
Ans A straight line is defined as the shortest distance between the two points.
Q45 What is true length of a line?
AnsWhen a straight line is inclined to one plane and parallel to the other, its projections on the plane to which it is parallel will show its true length.
Q46 What do you mean by projections of a straight line?
Ans To draw the front view, top view and side view of a straight line is called projection of a straight line.
Q47 What is inclination of a straight line?
Ans It is defined as the angle which the line makes with the plane. As such a line has two inclinations i.e. Inclination with the HP is represented by an angle θ and inclination of a line with VP is represented by an angle Φ
Q48 What are the apparent angles of inclinations?
Ans The angle made by the front view of a line with reference line (x-y line) is called apparent angle of inclination α
. The angle made by the top view of a line with reference line (x-y line) is called apparent angle of inclination β
Q49 Name the methods to determine the true length and true inclinations of a straight line.
Ans The following methods are used when the line is inclined to both the reference planes.1) Rotation method2) Auxiliary plane method3) Trapezoid method.
Q50 What is the trace of a straight line?
Ans When a straight line is inclined to a plane, it will meet that plane, produced if necessary. The point in which the line or line produced meets the plane is called its trace.
1) Horizontal trace
:-The point of intersection of the line with the HP is called the horizontal trace.
2) Vertical trace
:-The point of intersection of the line with the VP is called the vertical trace.
Q51Define a plane.
Ans A flat surface generated by moving a straight line in space is called a plane. A plane fig. has only two dimensions i.e. length and breadth.
Q52 What is the difference between a plane and a lamina?
Ans Plane:-A plane has no boundary and it extends to infinity in all directions.
Lamina:-The plane which has limited extent is also known as lamina.
Q53 What are the types of planes?
Ans There are two types of planes.
1) Perpendicular planes
:-The planes which are perpendicular to one or both the reference i.e. VP and HP are called perpendicular planes.
2) Oblique planes
:-The planes which are inclined to both the reference planes i.e. VP and HP are called oblique planes.
Q54 What is the trace of a plane?

Ans The lines in which the planes meet the reference planes i.e. HP and VP are called the traces of the planes. There are two types of traces of planes.

1) Horizontal trace

:-The intersection of a plane with the horizontal plane is called the horizontal trace.

2) Vertical trace

:-The intersection of a plane with the vertical plane is called the vertical trace.

Q55 What is a solid?

Ans An object having three dimensions i.e. length, breadth and height is called a solid. E.g. Prisms ,Pyramids, cone, cylinder etc.

Q56 What are different types of solids?

Ans Solids may be divided into two main groups.

1)Polyhedra or polyhedron

: - A polyhedra is defined as a solid bounded by planes called faces. Which meet in straight lines called edges?

2)Solids of revolution

: - The solids which are formed by the revolution of plane figures are known as solids of revolution. e.g. Cylinders, cones, sphere etc.

Q57:- What are right solids?

Ans A solid is said to be a right solid if its axis is perpendicular to its base or its end faces.

Q58 What are oblique solids

Ans If the axis of a solid is inclined at an angle other than 90º to its base or end faces, it is called as an oblique solid.

Q59 What are regular solids?

Ans If all the edges of the base or the end faces of a solid are equal in length and form regular plane figures, it is said to be a regular solid.

Q60 What is the difference between prism and pyramid?

Ans1) Prism

:- A prism is a polygon having two equal and similar end faces, called bases, parallel to each other and joined by other side faces which are rectangles or parallelograms.

2) Pyramid

: - A pyramid is a polyhedron, having a polygon as its base and a number of triangular faces, equal to the number of sides of the base polygon, meeting at a common point called the apex or vertex.

Q61 What are the various positions which a solid can take w.r.t. the reference planes?

Ans The following are the different positions which a solid can take w.r.t. the reference planes.(i)

The solid resting on base on H.P., with its axis perpendicular to H.P., and parallel to V.P.(ii)

The solid resting on face on H.P., with its axis perpendicular to V.P., and parallel to H.P.(iii)

The solids resting on face on H.P., with its axis parallel to H.P. and V.P.(iv)

The solid with its axis inclined to one plane and parallel to the other.(v)

The solid with its axis inclined to both the reference planes i.e., H.P. and V.P.

Q62 What is an isometric view?

Ans If the projection of an object is so drawn that all the three axis of the object are equally inclined to the plane of projection then it is called an isometric view.

Q63 What is an isometric scale?

Ans The proportion by which the actual length is converted to isometric length is called as isometric scale.

Q64 what are isometric axis?

Ans

The three lines OA, OB and OC meeting at a point and making 120º angles with each other are termed as isometric axis.

Q65 What are isometric and non isometric lines?

Ans The lines which are parallel to isometric axis are called as isometric lines. The lines which are not parallel to isometric axis are called non isometric lines.

Q66What are iso-metric planes?

AnS the planes representing the faces of an isometric view of the cube as well as the other planes parallel to these planes are called isometric planes.