INDIAN SCHOOL AL WADI AL KABIR

FIRST REHEARSAL EXAMINATION-2023-24

CLASS: XII   **Sub: ENGINEERING GRAPHICS (046)**   **MAX.MARKS: 70**
DATE: 05-12-2023   **TIME: 3 HOURS**

General Instructions:

(i) Attempt all the questions.
(ii) Use both sides of the drawing sheet, if necessary.
(iii) All dimensions are in millimeters.
(iv) Missing and mismatching dimensions, if any, may be suitably assumed.
(v) Follow the SP: 46 – 2003 revised codes. (with first angle method of projection).
(vi) In no view of question 21, are hidden edges or lines required.
(vii) In question 23, hidden edges or lines are to be shown in views without section.

SECTION – A (20 x 1 = 20)

1. Which type of projection is extensively used in mechanical engineering to show the blocks, machine parts, assemblies etc?

   a) Perspective projection

   b) Axonometric projection

   c) Orthographic projection

   d) Oblique projection

2. What do hidden lines in orthographic projections denote?

   a) Holes or slots

   b) Change of planes

   c) Position of cut

   d) Centre of a circle or cylinder

3. Which among these is used for power transmission?

   a) Square thread

   b) BSW thread

c) Metric thread internal

d) Metric thread external

4. Knuckle thread is a modified form of a _____ screw thread.
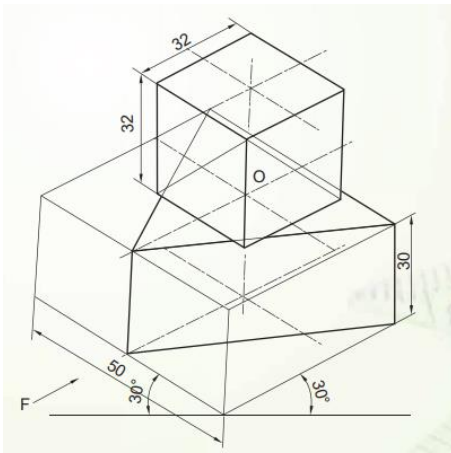
a) Square

b) BSW

c) Metric

d) V – thread

5. Select the correct option corresponding to the orientation of the given isometric projection.
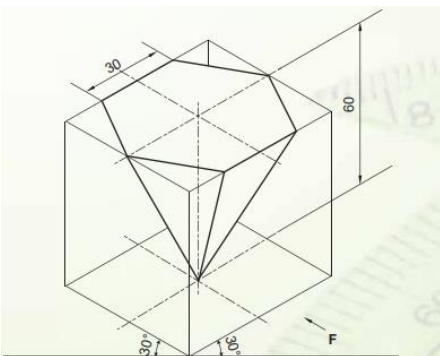

a) The top solid is square prism and the bottom solid is triangular prism.

b) The top solid is cube and the bottom solid is triangular prism

c) Both the solids are square prisms.

d) Both the solids are triangular prisms.

6. Select the correct option corresponding to the orientation of the given isometric projection.

a) The axis is inclined to H.P.

b) The axis is inclined to V.P.

c) The axis is perpendicular to H.P. and parallel to V.P.

d) The axis is perpendicular to V.P. and parallel to H.P

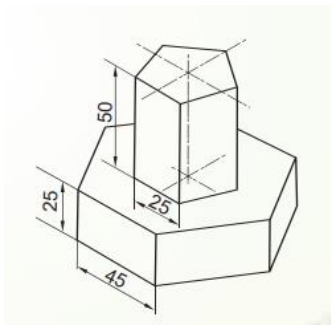7. Select the correct option corresponding to the orientation of the given isometric projection.

ISOMETRIC PROJECTION OF SPHERE
ON A HEXAGONAL PRISM
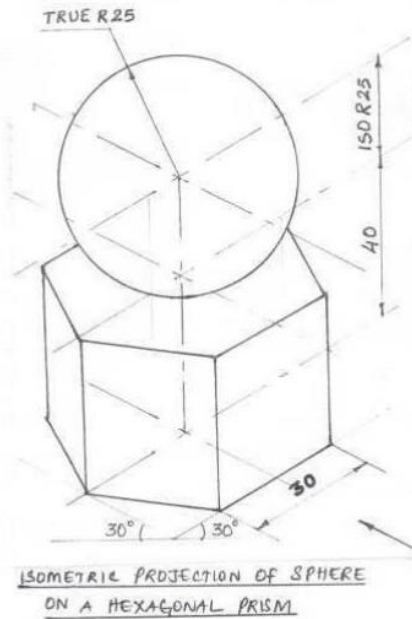
a) The isometric projection of a sphere is a circle whose diameter is equal to the isometric diameter of the sphere.

b) The isometric projection of a sphere is a circle whose diameter is equal to the true diameter of the sphere.

c) The isometric projection of a sphere is a circle whose diameter is equal to half of the true diameter of the sphere.

d) The isometric projection of a sphere is a circle whose diameter is equal to double of the true diameter of the sphere.

8. Match the LIST I with LIST II

| LIST 1	LIST II
1.Bolt	i. Boxing rings
2.Gasket	ii. Circular flared rim
3.Turnbuckle	iii. Temporary fastener
4.Flange	iv. Indian rubber/canvas

a) 1-i, 2-iii, 3-ii, 4-iv

b) 1-iii, 2-iv, 3-i, 4-ii

c) 1-iv, 2-ii, 3-iii, 4-i

d) 1-ii, 2-iv, 3-i, 4-iii

9. Choose the incorrect statement/s for the given figure.

i) Bottom solid is a hexagonal slab and top solid is a pentagonal prism

ii) Axis of both solid is perpendicular to HP

iii) Bottom solid is a hexagonal pyramid and top solid is a pentagonal pyramid

iv) Both solids are hexagonal prisms

a) (i) and (iv) only

b) (iii) and (iv) only

c) (i) and (iii) only

d) (iv) only

10. Select the correct option corresponding to the orientation of the given isometric projection.

ISOMETRIC PROJECTION
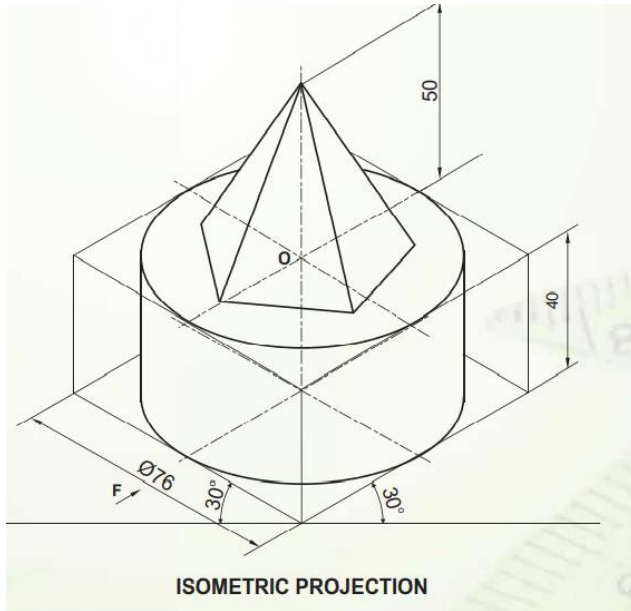
a) The size of common axis is true 90mm.

b) The size of common axis is less than true 90mm.

c) The size of common axis is more than true 90mm.

d) The size of common axis is true 100mm.

11. Name the material of the bush used in the bushed bearing.

a) Cast iron

b) Mild steel

c) High carbon steel

d) Gun metal

12. The end of the stud which is screwed in the body of casting with threaded hole is called------

a) Nut end

b) Metal end

c) Open end

d) Close end

13. The angle of chamfer is usually _____ with the base of a hexagonal nut.

a) 10 degree

b) 20 degree

c) 30 degree

d) 40 degree

14. Sleeve & Cotter joint is used to connect two _____.

   a) Square rods

   b) Elliptical rods

   c) Round rods

   d) Hollow rods

15. Select the correct sequence of drawing the isometric projection of a vertical equilateral triangular pyramid placed centrally on top of a vertical hexagonal prism.

   A. Draw three principal axes at 30°, 90° and 30° to the horizontal base line and copy the length of sides of helping figure's enclosing box on the respective principal axis and height of the prism on the third principal axis to form an enclosing box (cuboid) for hexagonal prism.

   B. Draw the direction of viewing and do the dimensioning.

   C. Draw the helping figure which is the base of vertical hexagonal prism (using isometric scale) and enclose it in a box, which is a rectangle.

   D. Copy the coordinates of the center and vertices of hexagon from the helping figure to enclosing box of hexagonal prism. Visible edges of hexagonal prism are joined by thick lines and axis of prism is drawn with chain line.

   E. Draw the enclosing box for the base of triangular pyramid on the top surface of the prism and construct a triangle. Mark the height of the triangular pyramid (apex) from the centre of top surface of prism at 90°. Join the generators of the triangular pyramid

   a) B, D, A, C, E
   b) C, A, D, E, B
   c) A, B, C, D, E
   d) D, E, B, A, C

Q16. to 20: Read the following paragraph and answer the questions given below.

One of the Engineering Graphics teacher from Indian school has taken her students to Industrial visit to a Mechanical based company.Students were curious and elated to see the various engineering products which made the human life easy and comfortable. Some machine parts like machine screws, studs and rivets caught the attention of students.

16.------------- is a bolt which is threaded throughout its length.

   a) Machine screw

   b) Rivet

c) Stud

d) Nut

17. While adjoining two parts, the tail is made into the form of head in -----------.

    a) Machine screws

    b) Rivet heads

    c) Studs

    d) Bolts

18. The outer diameter of head in pan head rivet of diameter 20mm is ----------

    a) 20
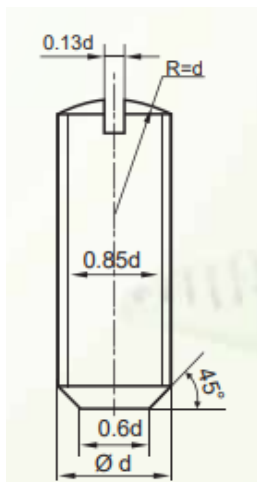
    b) 32

    c) 36

    d) 14

19. Identify the name of the machine part from the given figure?

    a) Pan head rivet

    b) Collar stud

    c) Grub screw

    d) Snap head rivet

20. The standard dimension for calculating the width of the collar in collar stud is ---------
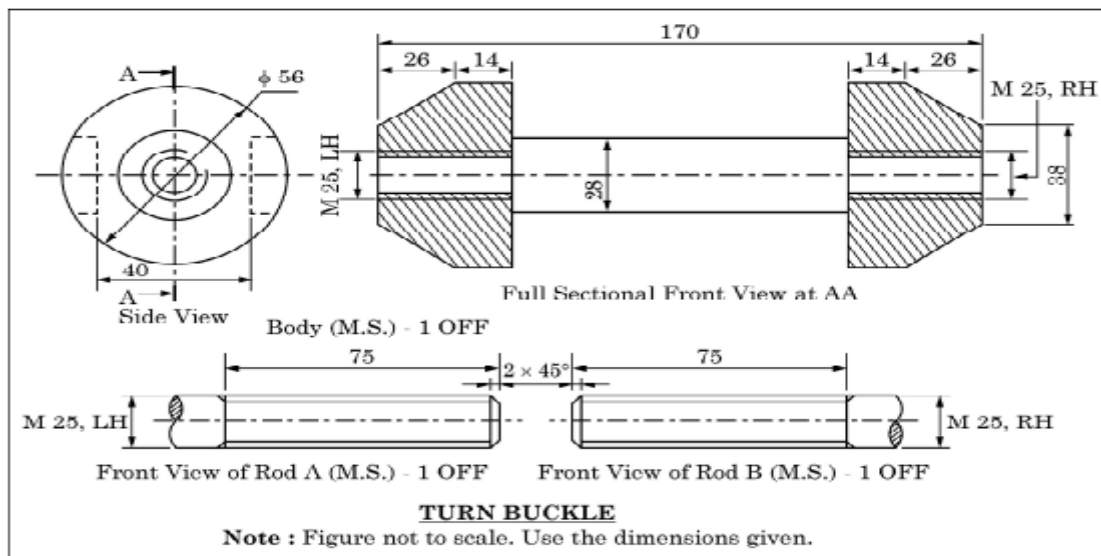
    a) d

    b) d to 1.5d

c) 0.4d

d) 2d+6

SECTION B

21.a) Construct an isometric scale. **1 x 5 = 5**

b). Draw the isometric projection of a pentagonal prism (base edge 25 mm, axial length 55mm) resting on its face with its axis parallel to H.P. and V.P. both. Indicate the direction of viewing. Give all the dimensions. **1x10 =10**

22. Draw to scale 1:1, the standard profile of Metric thread (Internal) with enlarged pitch as 50 mm. Give standard dimensions. **1 x 8 = 8**

OR

Draw to scale 1:1, the front view, top view and side view of a hexagonal nut of size M30, keeping the axis perpendicular to H.P. Give standard dimensions. **1 x 8 = 8**

23. The figure shows the details of the parts of a Tie Rod Joint (Turnbuckle). Assemble these parts correctly and then draw the following views to scale 1:1.Keep 60 mm threaded portions of each rod inside the body of Turnbuckle.

a) Front view lower half in section **(14)**

b) Top view **(7)**

c) Print title, scale used, projection symbol and give all dimensions. **(6)**

Full Sectional Front View at AA

Side View   Body (M.S.) - 1 OFF

Front View of Rod A (M.S.) - 1 OFF   Front View of Rod B (M.S.) - 1 OFF

TURN BUCKLE

Note : Figure not to scale. Use the dimensions given.

Figure-2, shows the assembly of an Open Bearing. Disassemble the parts correctly and then draw to scale 1: 1 the following views of the following components. Keep the same position of both, Body and Bush, with respect to H.P. and V.P.

(i) Body :   **(14)**

    (a) Front view, full sectional front view

    (b) Top view.

(ii) Bush :   **(7)**

    (a) Front view: left half in section.

    (b) Top view.

(iii) Print the titles of both and scale used. Draw the projection symbol. Give 6 important dimensions.   **(6)**

OPEN BEARING

Note : Figure not to scale. Use Dimension given for solution