Directorate of Education, GNCT of Delhi

Practice Paper 2023-24)

Engineering Graphics (046)

Class-XII

Time: 3 Hours   **Maximum Marks: 70**

General Instructions -

1. Question paper contains two sections Section-A & Section-B respectively.
2. Attempt all questions.
3. Use both sides of the drawing sheet, if necessary.
4. All dimensions are in millimetres.
5. Missing and mismatching dimensions, if any, may be suitably assumed.
6. Follow the SP: 46 – 2003 revised codes (with first angle method of projection).
7. In question 21, hidden edges or lines are not required.
8. In question 23, hidden edges or lines are to be shown in views without section.

SECTION – A

1. The roots and crests are rounded in _____thread profile.   (1)

    a. B.S.W.

    b. Metric (Internal)

    c. Metric (External)

    d. Square

2. Name the projection system used by artists and architects to show "one plane" drawings.   (1)

    a. Oblique projection

    b. Perspective projection

    c. Isometric projection

    d. Orthographic projection

3. The 40 mm long horizontal edge of a cube will be represented by _____ in its isometric

    projection   (1)

    a. A vertical line

    b. A horizontal line

    c. A line inclined at 30° with horizontal

    d. A line parallel to both H.P. & V.P.

4. Choose the **correct** option for the given figure: (1)
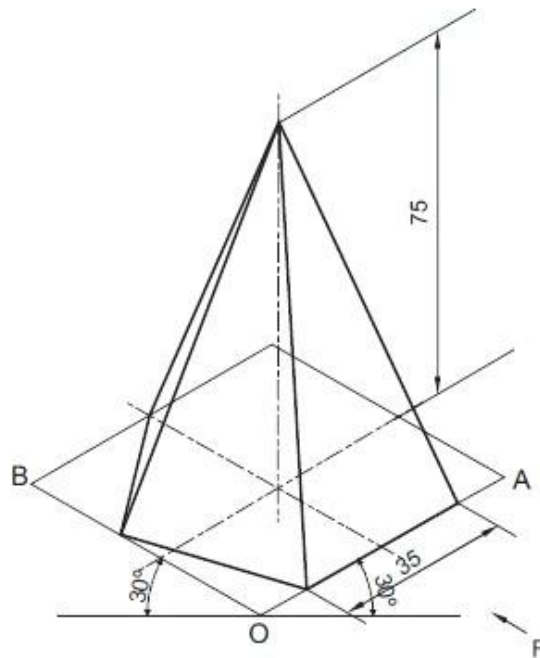
    a. The pentagonal face is parallel to V.P.

    b. The pentagonal face is perpendicular to V.P.

    c. The hexagonal face is parallel to H.P.

    d. The hexagonal face is perpendicular to H.P.

5. The outer diameter of the head of the 90° flat counter sunk machine screw of size M20 is: (1)

    a. Φ 36 mm

    b. Φ 40 mm

    c. Φ 20 mm

    d. Φ 30 mm

6. In a triple start thread, lead (L) will be equal to_____ (Where P is the pitch of thread). (1)

    a. 2P

    b. P

    c. 3P

    d. 4P

7. The number of parts in a Sleave and cotter joint is: (1)

    a. 4

    b. 3

    c. 5

    d. 2

8. In the side view of the conventional representation of external V-thread, the root of the thread is indicated by: (1)

    a. thick complete circle.

    b. Hidden complete circle.

    c. thick incomplete circle.

    d. thin incomplete circle.

9. In a Turnbuckle the LH and RH stands for: (1)

    a. Low Handle & Rise Handle

    b. Left Handle & Right Handle

    c. Low Humidity & Relative Humidity

    d. Left Hand & Right Hand

10. Identify the **correct** statements regarding the isometric projection :   (1)

    A. The length of all the edges is visible equal to their true dimensions.

    B. The isometric lines/edges parallel to horizontal plane are seen as horizontal lines.

    C. All vertical edges are visible as vertical lines.

    D. The isometric scale is used to measure the foreshortened length of all the edges.

    E. Lins parallel to principal axes are known as isometric lines.

Choose the **correct** answer from the options given below:

    a. A & D only

    b. C & E only

    c. C & D only

    d. D & E only

11. Identify the **correct** statements regarding Studs of nominal diameter "d":   (1)

    A. A stud is also known as headless bolt.

    B. The end of the stud where nut is to be screwed is known as metal end.

    C. Thickness of the collar in a collar stud is equal to "d."

    D. Threaded length of the nut end is equal to "2d+6."

    E. Stud with square head is used with square nut only.

Choose the **correct** answer from the options given below:

    a. A & D only

    b. B & C only

    c. C & E only

    d. D & E only

12. Identify the **correct** statements regarding Flange Pipe Joint: (1)

    A. The gasket is of a square shape.

    B. Rivets are used for joining flanges.

    C. PCD means Pitch Circle Diameter.

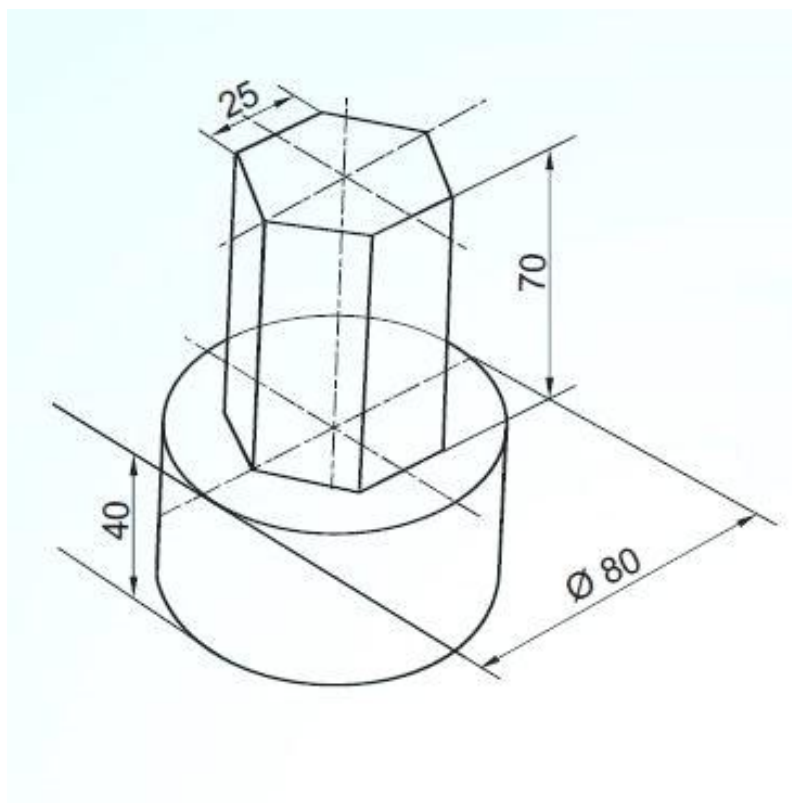D. Flange Joint is used for joining two pipes carrying liquid.

E. Four Flanges are used in this joint.

Choose the **correct** answer from the options given below:

    a. A & B only

    b. B & C only

    c. C & D only

    d. D & E only

13. Match Column-I with Column-II based on the given figure: (1)

	Column- I		**Column- II**
	(Dimensions)		**(Approx. Isometric Length)**
1	Diameter of circular base of cylinder	(i)	56
2	Length of the axis of the cylinder	(ii)	20
3	Length of the Base edge of the prism	(iii)	64
4	Length of the axis of the prism	(iv)	32

Choose the **correct** answer from the options given below:

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

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

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

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

14. Match Column-I with Column-II regarding Square headed bolt of nominal diameter "d": (1)

	Column- I		Column- II
1	Thickness of head	(i)	1.5d+3
2	Diameter of chamfer circle	(ii)	0.8d
3	Major diameter	(iii)	2d+6
4	Threaded length of shank	(iv)	d

Choose the **correct** answer from the options given below:

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

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

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

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

15. Match Column-I with Column-II regarding machine assembly: (1)

	Column- I (Part of assembly)		Column- II (Material of part)
1	Cotte	(i)	Gun Metal
2	Body of Bearing	(ii)	Indian Rubber
3	Gasket	(iii)	Cast Iron
4	Bush	(iv)	Mild Steel

Choose the **correct** answer from the options given below:

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

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

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

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

Read the passage and answer the questions from 16 to 20 given belov

Rajeev is a civil engineer who is building a water tank as shown in the image. Shape of the tank is hemispherical and its draining is done via cylindrical pipe connected to the ground. The diameter of the tank is 8 meter and of the pipe is 500 millimetre. The length of the drain pipe is 20 meter. For preparing the engineering drawing of the tank answer the following question Ignoring the other supportiv structure of the tank).

16. We need _____ scale for drawing the tank on A3 size paper. (1)

    a. Enlarged

    b. Reduced

    c. True

    d. Vernier

17. The total height of the tank along with drain pipe is _____. (1)

    a. 24 meter

    b. 20 meter

    c. 04 meter

    d. 16 meter

18. The common axis of the tank is _____. (1)

    a. Perpendicular to V.P.

    b. Parallel to H.P.

    c. Parallel to both H.P. and V.P.

    d. Perpendicular to H.P.

19. The isometric projection of the top circular face of the tank is: (1)

    a. a circle

    b. an ellipse

    c. a semicircle

    d. a square

20. In the isometric projection of the tank, the diameter of the drain pipe will be reduced by: (1)

    a. 81.5%

    b. 46.5%

    c. 18.5%

    d. 55.4%

SECTION – B

21.

    a. Construct an isometric scale. (5)

    b. Draw the isometric projection of a Triangular prism (base edge 45 mm and axial height 65 mm) resting on its triangular face on H.P. keeping its axis perpendicular to H.P. One of its base edges is parallel to V.P. and near to the observer. Indicate the direction of viewing and give the dimensions. (10)

22. Draw to the scale 1:1, the standard profile of the Metric thread profile (internal) taking enlarged pitch 50 mm. Give standard dimensions. (8)

OR

Draw to scale 1:1, the Front View and Side View of a Square headed bolt with diameter 30 mm. Keep its axis parallel to both V.P and H.P. Give standard dimensions. (8)

23. Figure-1 shows the details of parts of a Flange Pipe Joint. Assemble all the parts correctly and then draw to scale 1:1; its following views:

   a. Front View, upper half in section (14)

   b. Side View, seen from right (7)

   Print the title and scale used. Draw projection symbol. Give six important dimensions. (6)

OR

Figure-2 shows the assembly of the parts of a 'TURNBUCKLE'. Disassemble the parts correctly and then draw to scale 1:1 its following views of the following parts. Keeping the same position with respect to H.P and V.P. as given:

   a) BODY

   i) Front View, Full in section. (8)

   ii) Side View, as seen from left. (7)

   b) ROD-A

   i) Front View. (3)

   ii) Side View, as seen from right. (3)

   Print the titles of both parts and scale used. Draw the projection symbol. Give six important dimensions. (6)
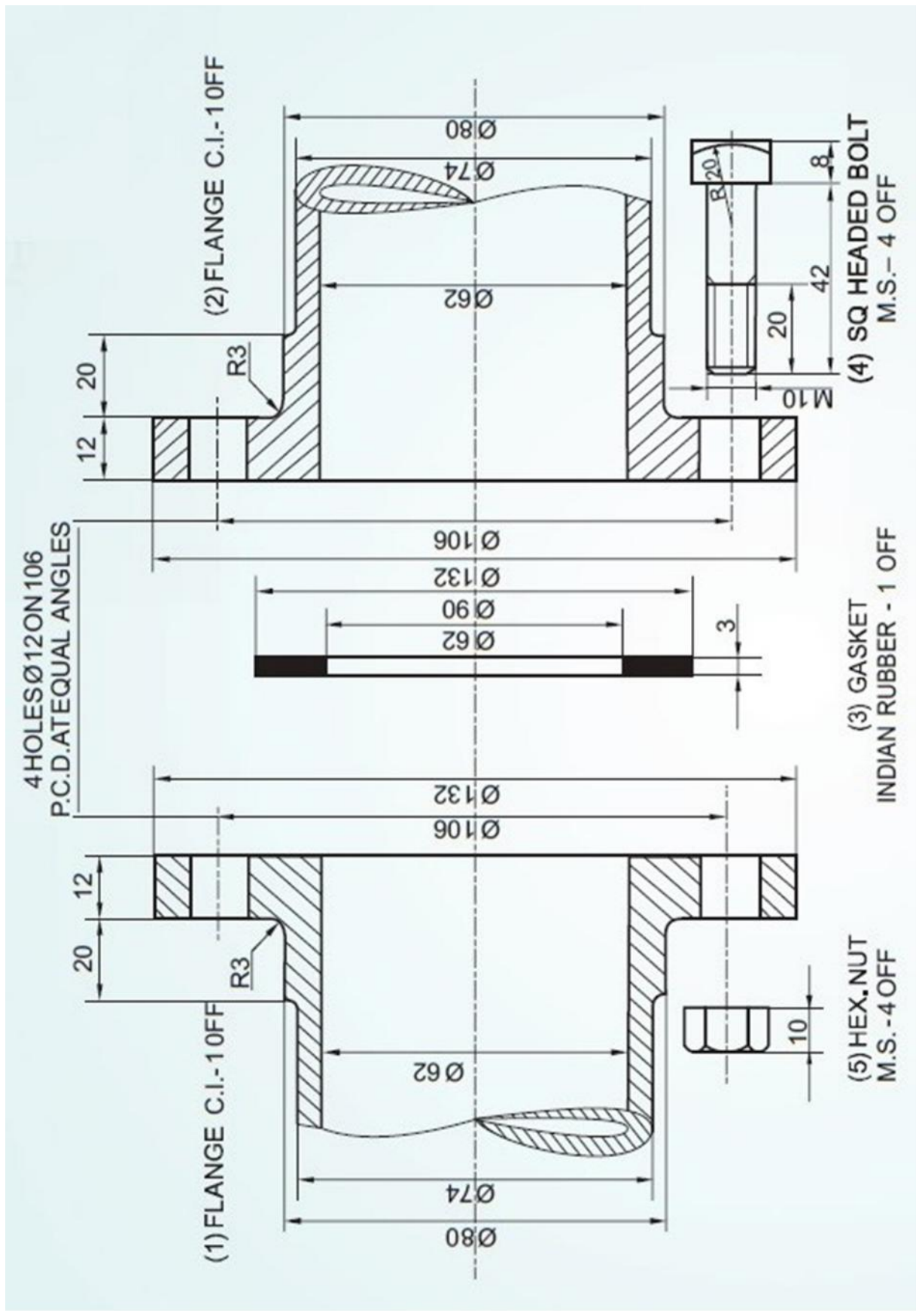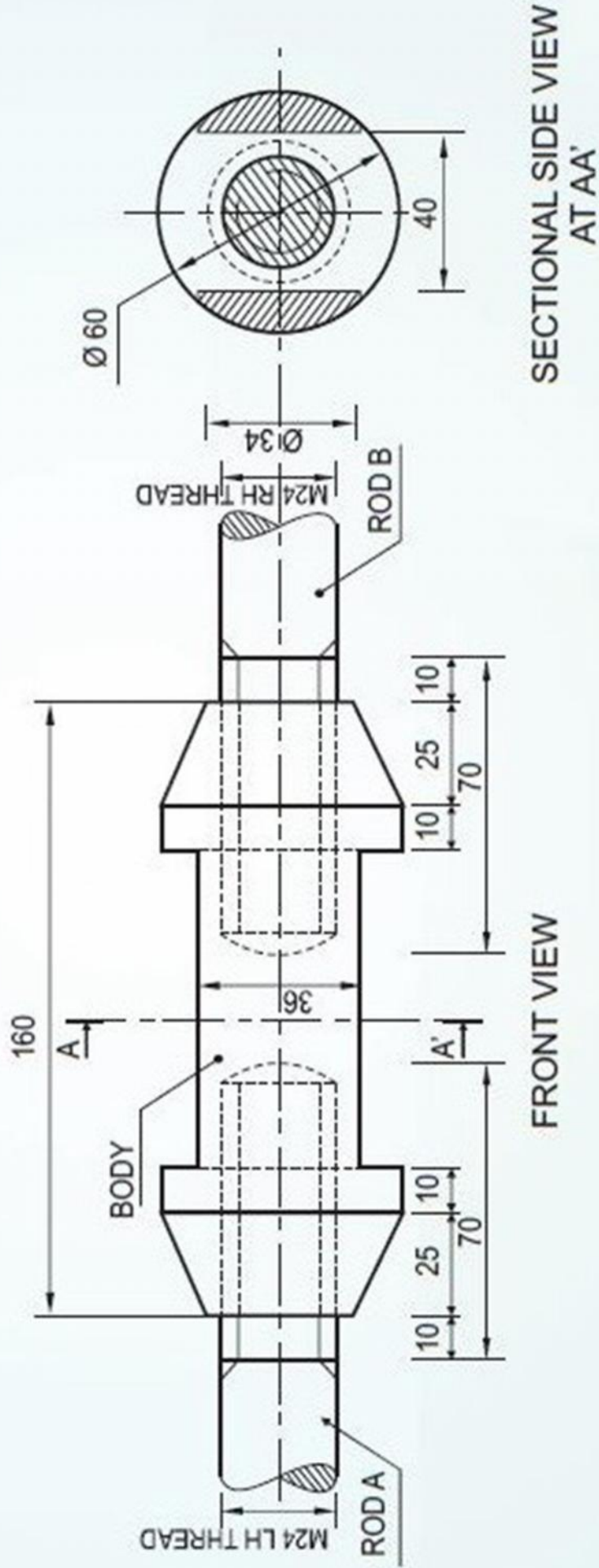
Figure - 1

SECTIONAL SIDE VIEW
AT AA'

Ø 60

Ø 34

M24 RH THREAD

ROD B

160

BODY

36

A

A'

10   25   10
       70

10   25   10
       70

40

M24 LH THREAD

ROD A

FRONT VIEW

TURNBUCKLE

Figure - 2