

CBSE Class 12 Engineering Graphics 2023 - Set 68



Question Paper

Conducted by the Central Board of Secondary Education (CBSE)

Time Allowed: 3 Hours

Maximum Marks: 70

General Instructions

- (i) Attempt all the questions.
- (ii) Use both sides of the drawing sheet, if necessary.
- (iii) All dimensions are in millimetres.
- (iv) Missing or mismatching dimensions, if any, may be suitably assumed.
- (v) Follow the SP 46:2003 revised codes, with first-angle method of projection.
- (vi) In Question 21 and Question 22, no hidden edges or lines are required.
- (vii) In Question 23, hidden edges or lines must be shown in views without section.

Section A

Q.1 to Q.8 : Answer the following multiple choice questions. Print the correct choice on your drawing sheet.

1. The most important point of isometric projection is that it needs _____ to measure along each of the three axes.

- (A) a single arc (B) double arcs
(C) a single scale (D) double scales

2. If a cube is placed on one of its corners on the ground with a solid diagonal $\perp$ to the V.P, then _____ will be the isometric projection of the cube.

- (A) the right side view (B) the left side view
(C) the front view (D) the top view

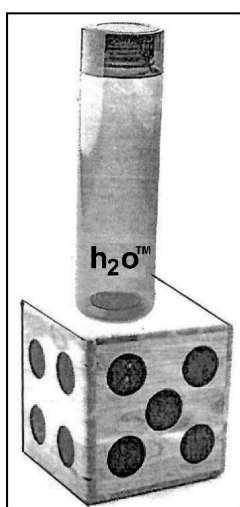
3. _____ are used to attain the uniform height of letters, in technical writing.

- (A) Centre lines (B) Dash lines
(C) Axis lines (D) Guide lines

4. The front view of a vertical cone resting on its base on H.P will be _____.

- (A) a triangle (B) a rectangle
(C) a circle (D) a semicircle

5. If a water bottle is placed on a dice stool, as shown below, what would it look like ?



- (A) A cylinder on a sphere (B) A cylinder on a cube
(C) A cone on a sphere (D) A cone on a cube

6. Select the Journal Bearing among the following :

- (A) Linear Bearing (B) Bush Bearing
(C) Pivot Bearing (D) Spherical Bearing

7. The body of a turnbuckle has a slot at the central portion _____.

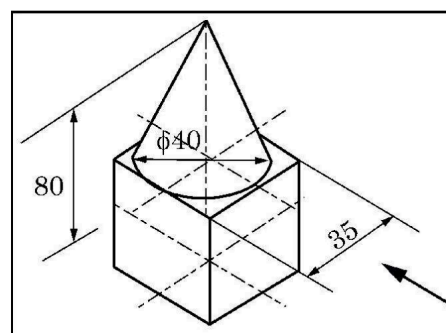
- (A) to reduce the friction (B) to increase the friction
(C) to aid removing the defect in manufacturing (D) to aid tightening and loosening of rods by tommy bar

8. In Bush bearing the base plate or sole is recessed up to _____.

- (A) 5 mm (B) 4 mm
(C) 3 mm (D) 2 mm

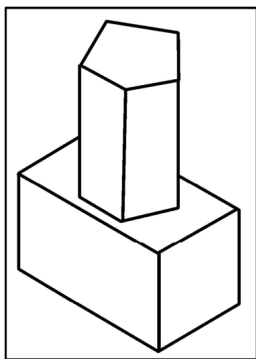
Q. 9 to Q. 14 : Select the correct option corresponding to the orientation of the given isometric projection.

9.



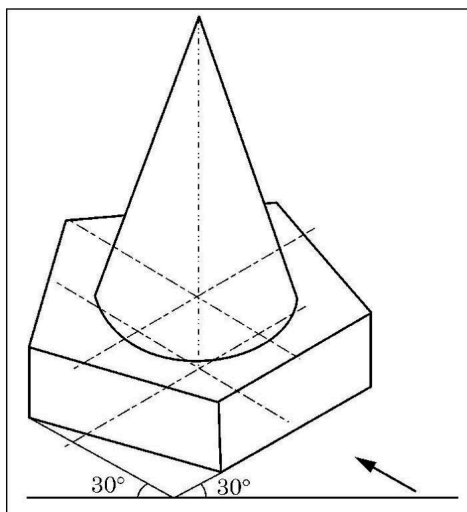
- (A) A cube is placed on a cone. (B) A cone is placed on a cube.
(C) The axis of both the solids are vertical. (D) Both (b) and (c)

10. Total No. of rectangular surfaces in the fig. is



- (A) Six (B) Eight
(C) Nine (D) Zero

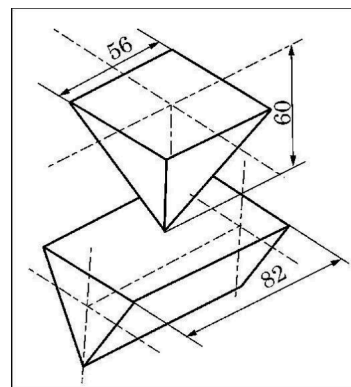
11.



1. A cone is kept on a pentagonal slab when one of the base edges of the prism parallel to VP and nearer the observer.
2. A cone is kept on a pentagonal pyramid when one of its base edges $\parallel$ to VP and away from the observer.
3. A cone is kept on a pentagonal pyramid when one of the base vertices of the pyramid is at the rear.
4. A cone is kept on a pentagonal prism when one of the base vertices of the prism is at the rear.

- (A) (ii) and (iv) only (B) (ii) and (iii) only
(C) (i) and (iv) only (D) (i) and (iii) only

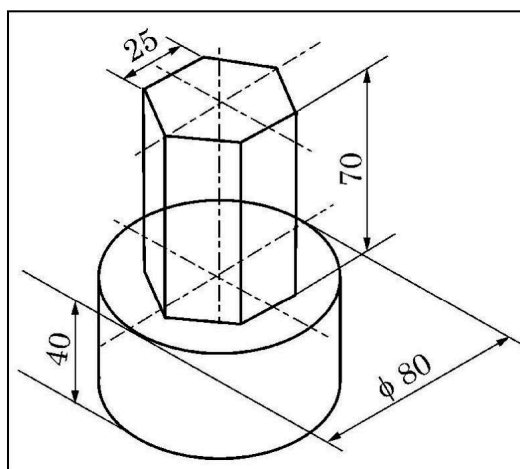
12.



1. Both the solids are triangular pyramids.
2. Both the solids are triangular prisms.
3. Bottom solid is a triangular prism and the top solid is a square pyramid.
4. Bottom solid is a triangular pyramid and the top solid is a triangular prism.

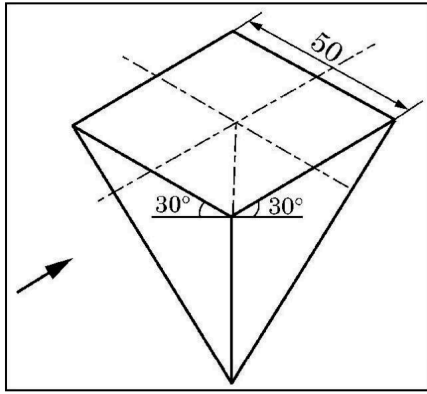
- (A) (iii) only (B) (i) and (iii) only
(C) (ii) only (D) (ii) and (iv) only

13.



- (A) The axis of top solid is horizontal. (B) The axis of bottom solid is horizontal.
(C) The common axis is vertical. (D) The common axis is horizontal.

14.



- (A) The solid is resting with its base when its axis is $\parallel$ to VP. (B) The solid is resting on its apex when its axis is $\perp$ to VP.
- (C) The solid is resting on its apex when its axis is $\parallel$ to VP. (D) The solid is resting with its base when its axis is $\perp$ to VP.

15. Two statements are given – one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer from the codes (a), (b), (c) and (d) as given below.

Assertion (A) : The bolt and nut together are called screw pair.

Reason (R) : Threaded pieces are commonly used in pairs to hold different machine parts together.

- (A) Both (A) and (R) are true and (R) is the correct explanation of (A). (B) Both (A) and (R) are true and (R) is not the correct explanation of (A).
- (C) (A) is true, but (R) is false. (D) (A) is false, and (R) is also false.

Q. 16 to Q. 20 : Read the following paragraph and answer the following questions :

A group of class XIIth students having an optional subject Engineering Graphics visited a Thermal Power Plant along with their subject teacher on Industrial Tour. The subject teacher showed them a Boiler and asked a few questions about the applications of Permanent fastener.

16. Generally, rivets are used as fasteners

- (A) in Rubber structures (B) in Concrete structures
- (C) in Steel structures (D) in Plastic structures

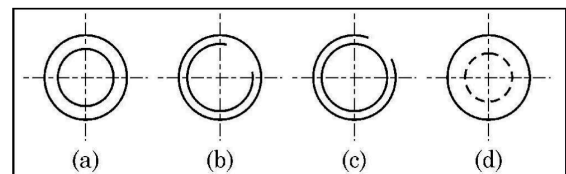
17. A rivet is a ____.

- (A) threaded fastener (B) non-threaded fastener
- (C) support for vertical shafts (D) support for horizontal shafts

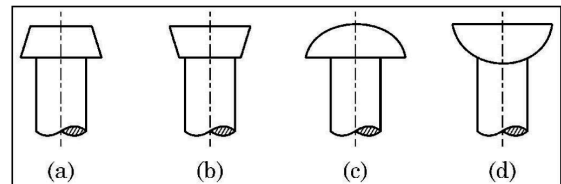
18. Select the standard dimension of outer diameter of a flat head rivet of diameter 'd'.

- (A) d (B) 1.5 d
- (C) 2 d (D) 2.5 d

19. Select the top view of a vertical snap head rivet.



20. Select the front view of a pan head rivet.



Section B

21(a). Construct an isometric scale.

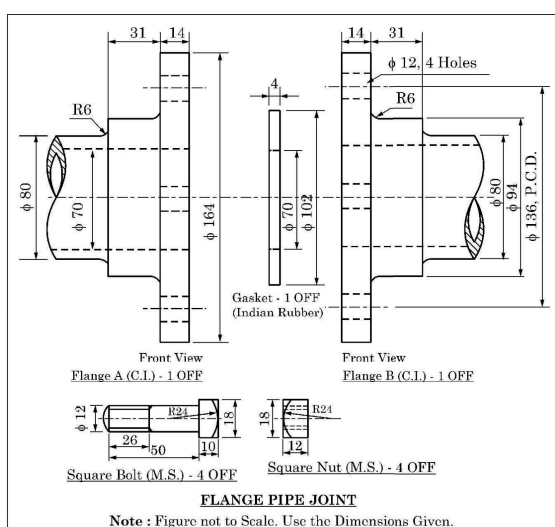
21(b). A vertical pentagonal pyramid (base edge 30 mm, height 60 mm) standing on its apex on H.P. One of its pentagonal edge is perpendicular to V.P. Draw its isometric projections. Give all the dimensions and indicate the direction of viewing.

22. Draw to scale 1 : 1 the standard profile of **Metric thread** external with enlarged pitch 40 mm. Give standard dimensions.

OR

22. Draw to scale 1 : 1, the front view and top view of a vertical **Hexagonal nut** of diameter 25 mm. Give standard dimensions.

23. Fig. 1 shows the details of the parts of a **FLANGE PIPE JOINT**. Assemble all these parts correctly and then draw to scale 1 : 1 its following views :



An enlarged drawing is provided in the drawing references at the end of this paper.

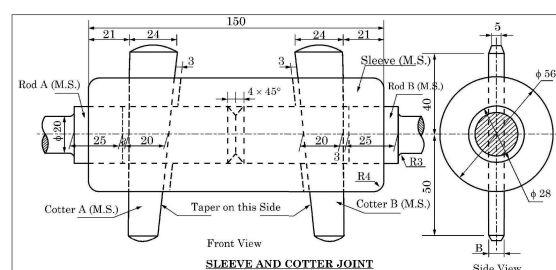
23(i). Front view lower half in section

23(ii). Right side view

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

OR

23. Fig. 2 shows the assembly of a **SLEEVE AND COTTER JOINT**. Disassemble the parts correctly and then draw to scale 1 : 1 its following views of the following components. Keep the same position of both sleeve and rod with respect to H.P and V.P



An enlarged drawing is provided in the drawing references at the end of this paper.

23(a)(i). SLEEVE

Full sectional front view

23(a)(ii). SLEEVE

Top view

23(b)(i). ROD A

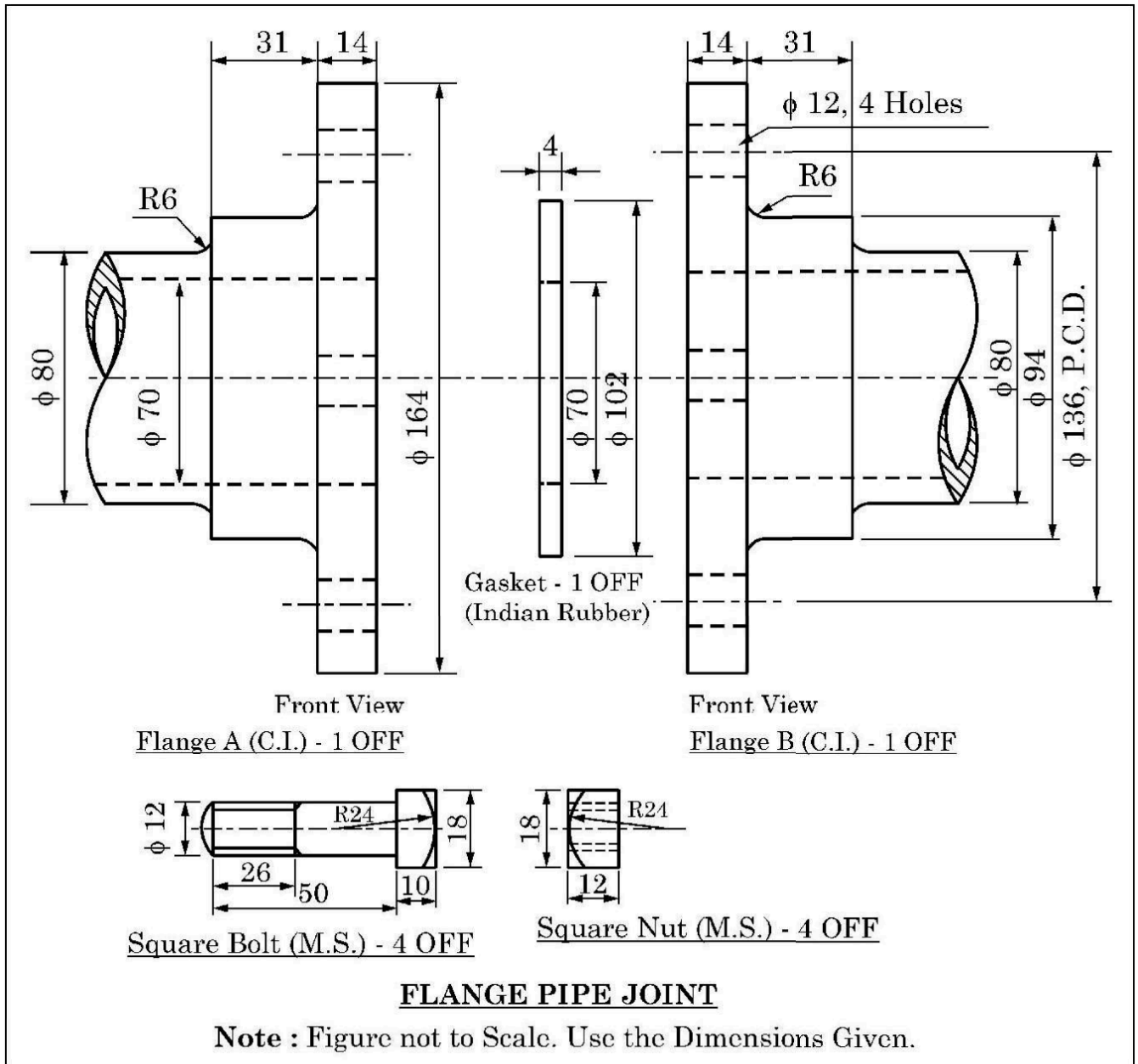
Front view upper half in section.

23(b)(ii). ROD A

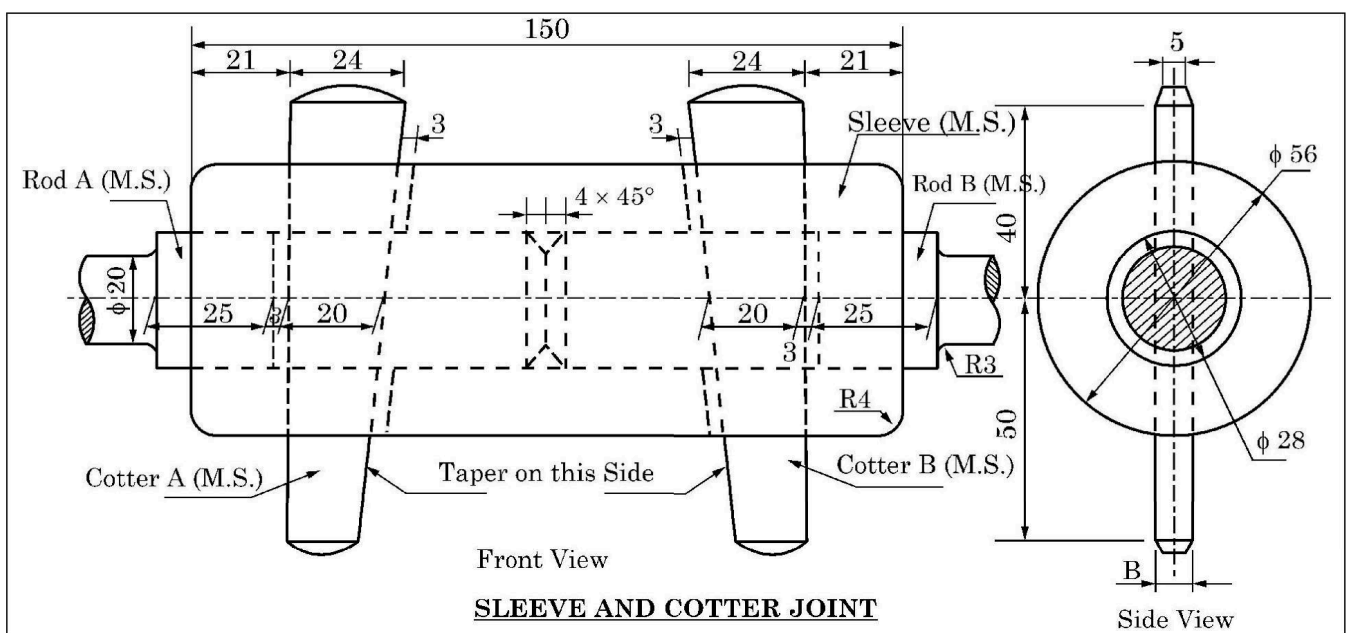
Left side view

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

Question 23 — Figure 1



Question 23 — alternative — Figure 2



- End of Question Paper -