

CBSE Class 12 Engineering Graphics 2024 - 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, 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.20 : Answer the following multiple choice questions. Print the correct choice on your drawing sheet.

1. The three forms of pictorial projection are

- | | |
|-------------------------------------|--|
| (A) oblique, perspective and linear | (B) axonometric, oblique and perspective |
| (C) perspective, linear and skewed | (D) axonometric, offset and co-ordinate |

2. If an isometric drawing is made by use of isometric scale then the drawing is called _____.

- | | |
|-----------------------|--------------------------|
| (A) Isometric view | (B) Isometric projection |
| (C) Orthographic view | (D) Sectional view |

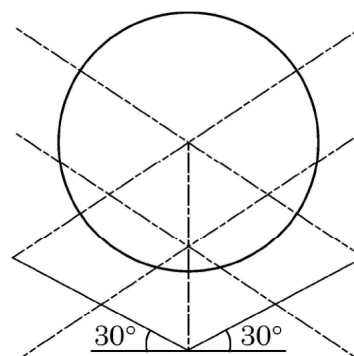
3. In orthographic projection, if an object lies in second quadrant, its position with respect to reference planes will be

- | | |
|-------------------------------------|--------------------------------|
| (A) in front of V.P. and below H.P. | (B) behind V.P. and above H.P. |
| (C) in front of V.P. and above H.P. | (D) behind V.P. and below H.P. |

4. The isometric is the drawing with _____.

- | | |
|-------------------|---------------------|
| (A) Reduced scale | (B) Actual scale |
| (C) Vernier scale | (D) Isometric scale |

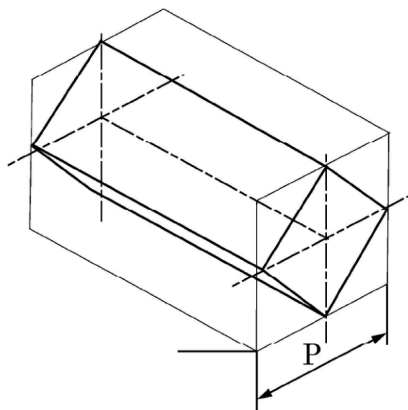
5. Select the correct statements for the given figure :



1. The diameter of sphere in isometric projection, is foreshortened.
2. The isometric projection of sphere is a circle.
3. The isometric projection of sphere is an ellipse.
4. The diameter of sphere in isometric projection remains same.

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

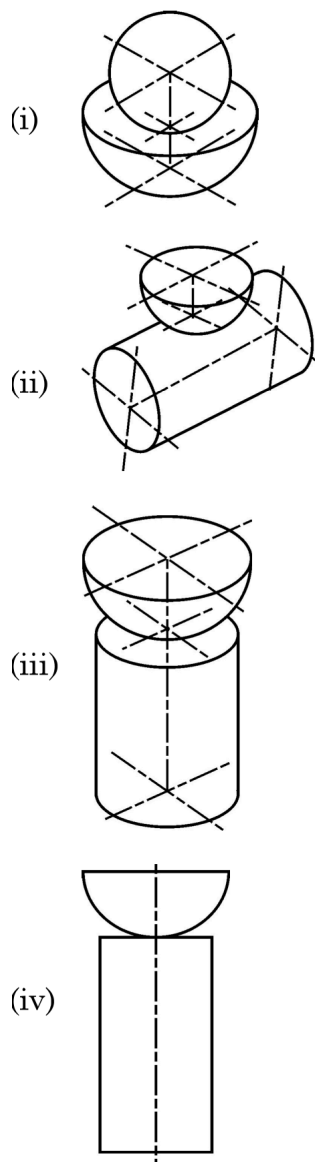
6. Select the correct statements, regarding the value of 'P' in the given isometric projection.



1. 'P' is equal to the given length of the prism.
2. 'P' is not equal to the given end edge of the prism.
3. 'P' will be obtained from the orthographic helping view.
4. 'P' can be assumed as any numeral.

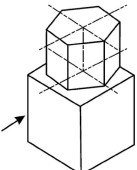
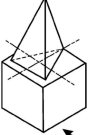
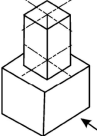
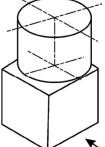
- (A) (i) and (ii) only (B) (i) and (iii) only
(C) (ii) and (iii) only (D) (ii) and (iv) only

7. A hemisphere placed on top of a vertical cylinder. Select the correct option which represents the isometric projection.



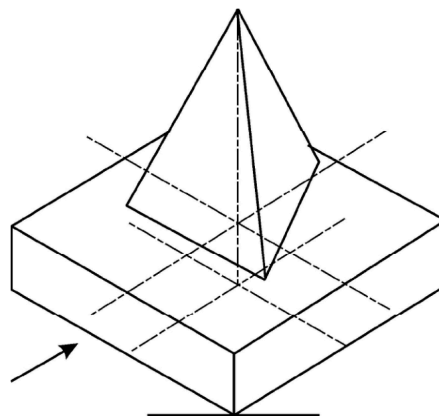
- (A) (i) (B) (ii)
(C) (iii) (D) (iv)

8. Match the List – I with List – II :

List – I Isometric projection of solids	List – II Top view in orthographic projection (Figure not to scale)
1. 	(i) 
2. 	(ii) 
3. 	(iii) 
4. 	(iv) 

- (A) 1-(i), 2-(iii), 3-(ii), 4-(iv)
 (B) 1-(ii), 2-(iv), 3-(iii), 4-(i)
 (C) 1-(ii), 2-(i), 3-(iv), 4-(iii)
 (D) 1-(i), 2-(iii), 3-(iv), 4-(ii)

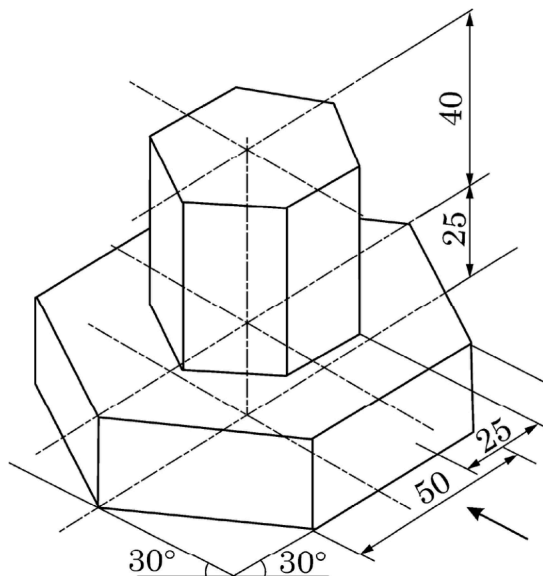
9. Select the correct statement/s for the given isometric projection of combination of solids :



- The solids are kept in such a way that one of the base edges of the prism and two of the base edges of the pyramid are parallel to V.P.
- The solids are kept in such a way that one of the base edges of the prism and two of the base edges of the pyramid are perpendicular to V.P.
- The solids are kept in such a way that two of the parallel base edges of prism and one of the base edges of pyramid are perpendicular to V.P.
- The solids are kept in such a way that two of the parallel base edges of prism and one of the base edges of pyramid are parallel to V.P.

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

10. Match the List – I with List – II, for the given isometric projection of combination of solids :



List – I	List – II
1. Total number of hexagonal faces	(i) Perpendicular to V.P
2. Total number of rectangular faces	(ii) Perpendicular to H.P
3. Bases of both solids	(iii) Twelve
4. Axes of both solids	(iv) Four

- (A) 1-(iv), 2-(iii), 3-(i), 4-(ii) (B) 1-(iii), 2-(iv), 3-(ii), 4-(i)
- (C) 1-(ii), 2-(i), 3-(iii), 4-(iv) (D) 1-(i), 2-(ii), 3-(iv), 4-(iii)

11. Match the List – I with List – II :

List – I	List – II
Conventional representation	Components
1.	(i) rods of square cross-section
2.	(ii) pipes
3.	(iii) round rod with external threads
4.	(iv) round rod without thread

- (A) 1-(i), 2-(iv), 3-(iii), 4-(ii) (B) 1-(ii), 2-(iii), 3-(iv), 4-(i)
- (C) 1-(iv), 2-(i), 3-(ii), 4-(iii) (D) 1-(ii), 2-(i), 3-(iv), 4-(iii)

12. In a gib and cotter joint, if the thickness of cotter is 8 mm, then the thickness of gib will be

- (A) 8 mm (B) 6 mm
- (C) 4 mm (D) 2 mm

13. The rods in a tie rod joint are externally threaded and the holes in the cylindrical body are _____ threaded.

- (A) internally (B) externally
- (C) tangentially (D) concurrently

14. Lead is the distance moved by a nut or bolt in the axial direction in _____ complete rotation.

- (A) three (B) half
- (C) two (D) one

15. In a vertical hexagonal nut, the chamfering is seen as _____ in front view and _____ in top view.

- (A) quadrant, lines (B) arcs, circle
(C) lines, quadrant (D) circle, arcs

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

Akash joined as a helper in an automobile spare parts shop. On his first day of work, the supervisor told him to segregate the small machine parts kept in a rack. Akash categorised each small part based on its common feature. He made one group of machine parts having body of cylindrical cross-section without head. He also observed that all the machine parts in that group had different types of central portion with threads on both ends. These machine parts are known as studs.

16. In top view external thread of a vertical stud is represented by

- (A) both major and minor diameter circles as incomplete circles. (B) both major and minor diameter circles as complete circles.
(C) major diameter circle as a complete circle and minor diameter circle as an incomplete circle. (D) major diameter circle as an incomplete circle and minor diameter circles as a complete circle.

17. _____ is used where sufficient space for bolt head is not available.

- (A) Collar rod (B) CSK rivet
(C) Stud (D) CSK screw

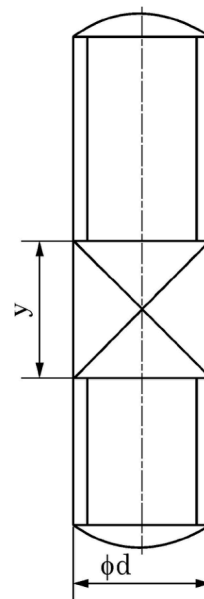
18. The thickness of collar in a collar stud of 30 mm diameter is

- (A) 12 mm (B) 30 mm
(C) 45 mm (D) 66 mm

19. Apart from stud with square neck and collar stud, _____ is the third type of stud.

- (A) pipe stud (B) rim stud
(C) socket stud (D) plain stud

20. If 20 mm is the diameter of a stud with square neck, then the value of 'y' in the figure is



- (A) 16 mm (B) 20 mm
(C) 43 mm (D) 46 mm

Section B

21(A). Construct an isometric scale.

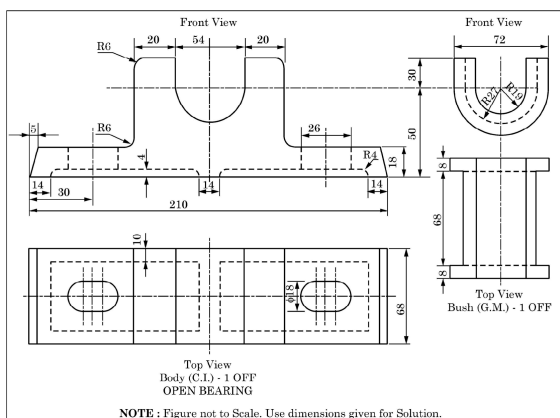
21(B). Draw the isometric projection of a pentagonal prism (base edge 25 mm, height 50 mm) is resting on its base on H.P. One of its base edges is parallel to V.P. and away from it. The axis is parallel to V.P. and perpendicular to H.P. Indicate the direction of viewing. Give all the dimensions.

22(A). Draw to scale 1 : 1, the standard profile of **knuckle thread** taking enlarged pitch 60 mm. Give standard dimensions.

OR

22(B). Draw to scale 1 : 1, the front view and left side view of a **square headed bolt**. Keep the axis parallel to both V.P. and H.P, take the nominal diameter of bolt as 20 mm and length of bolt as 80 mm. Give standard dimensions.

23(A). Fig. 1 shows the details of the parts of an **Open Bearing**. 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.

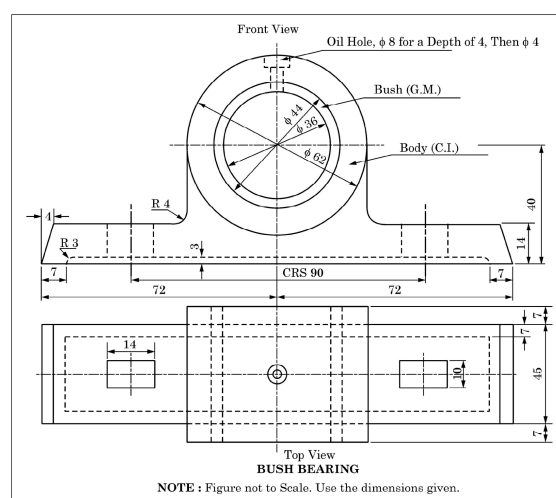
23(A)(i). Front view, right half in section.

23(A)(ii). Left side view

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

OR

23(B). Fig. 2 shows the assembly of a **Bush Bearing**. Disassemble the parts correctly and then draw to scale 1 : 1 its following views of the following components. Keep the same position of both body and bush with respect to H.P. and V.P.



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

23(B)(i)(a). Body

Full sectional front view

23(B)(i)(b). Body

Left side view

23(B)(ii)(a). Bush

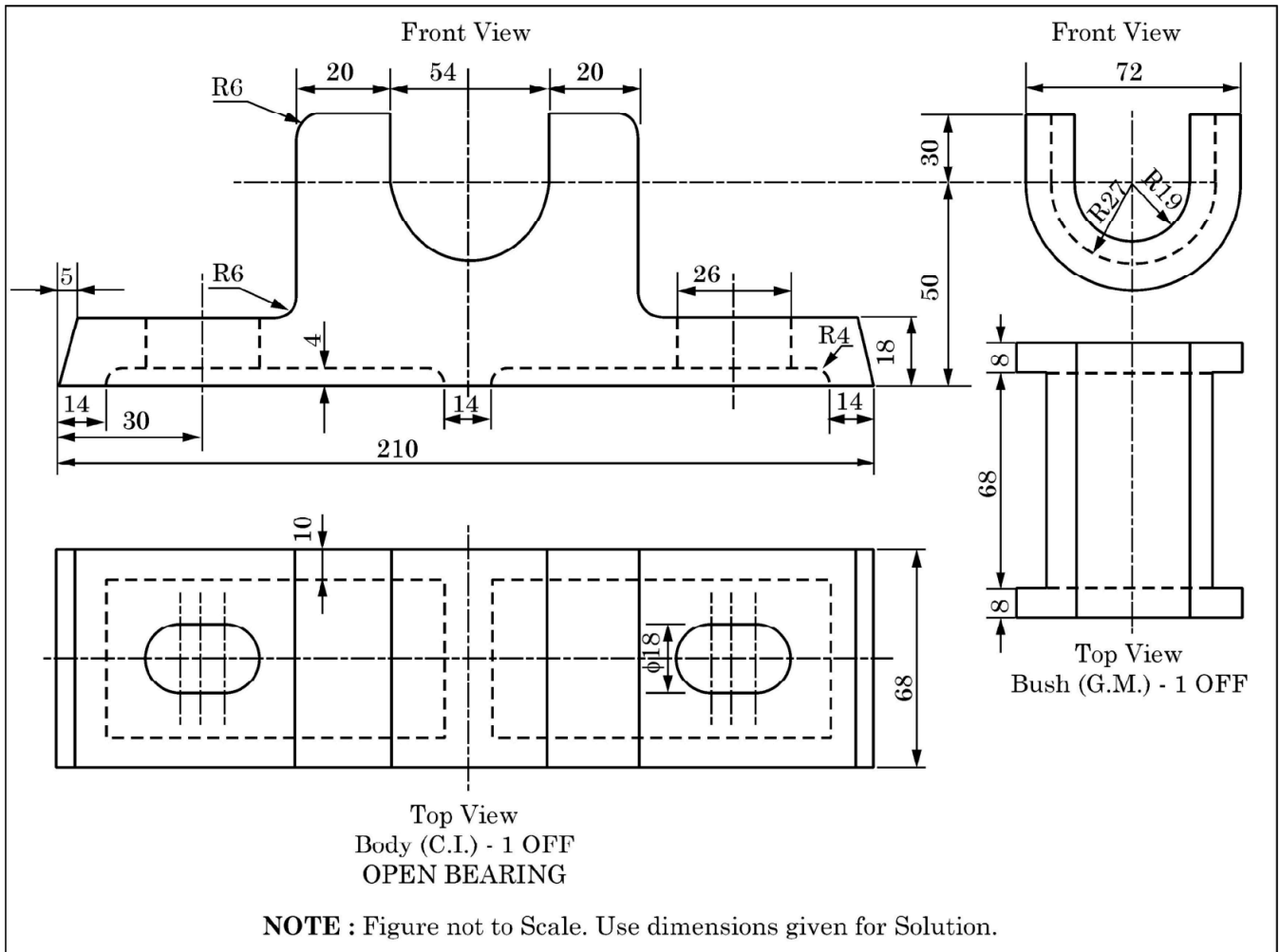
Front view

23(B)(ii)(b). Bush

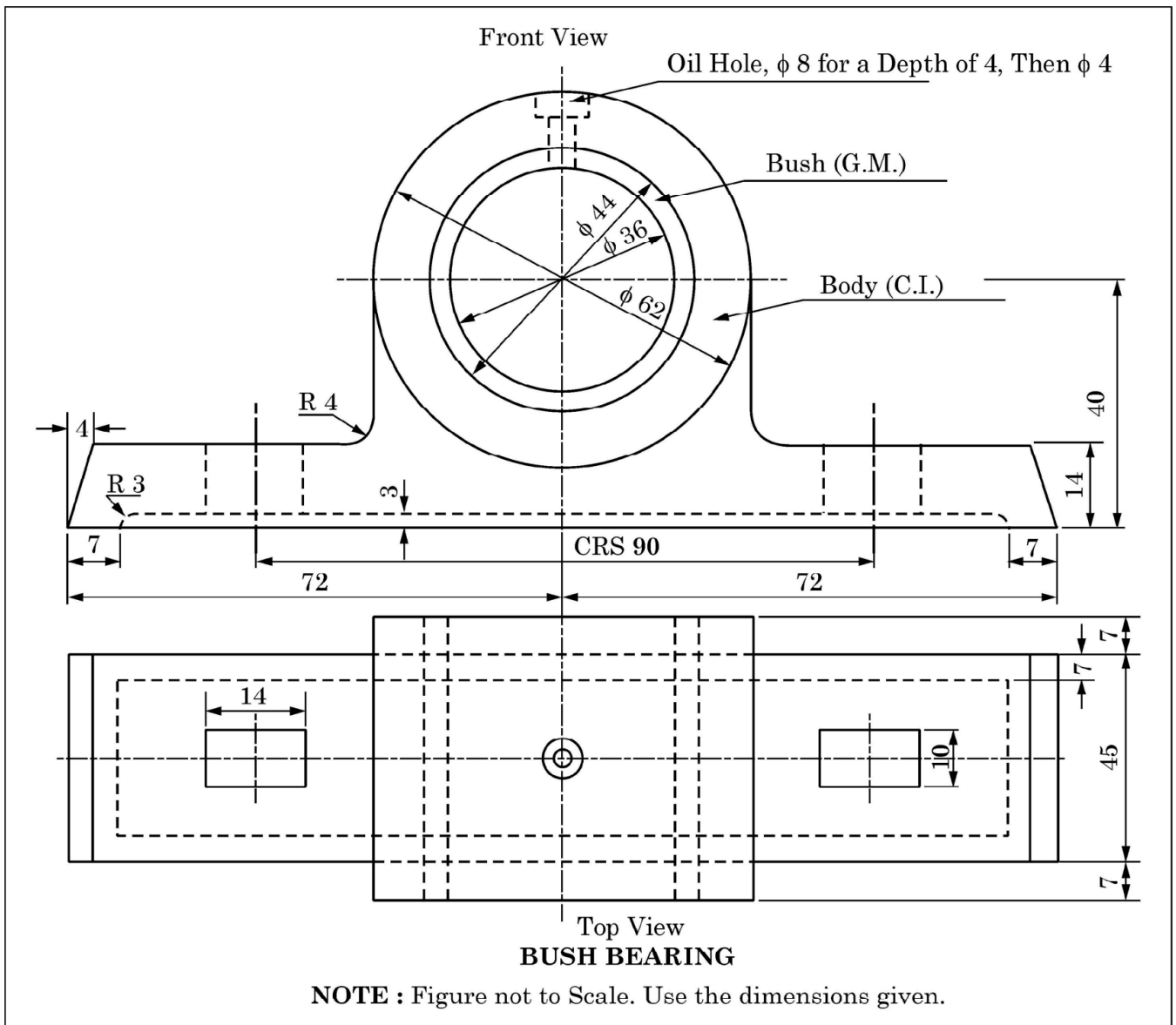
Full sectional right side view

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

Question 23(A) — Figure 1



Question 23(B) — alternative — Figure 2



- End of Question Paper -