Indian School Al Wadi Al Kabir

Assessment I (2024-2025)

Class: XII | Sub: Engineering Graphics (046) | Max. Marks: 70
Date: 29/09/2024 | Set - I | 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 question 23, hidden edges or lines are to be shown in views without section.
(vii) In question 24, no hidden edges or lines required.

14 x 1 = 14

SECTION – A

Q.1 to Q.14: Answer the following multiple-choice questions. Print the correct choice on your drawing sheet.

1. Which projection needs a single scale to measure along each of the three axes?
   (a) Orthographic

   (b) Oblique

   (c) Isometric

   (d) Perspective

2. In orthographic projection, if an object lies in third quadrant, its position with respect to reference planes will be
   (a) Below HP and behind VP

   (b) Above HP and in front of VP

   (c) Below HP and in front of VP

   (d) Above HP and behind VP

3. A solid without any edge or vertex, when visualized from any direction appears as a circle is:
   (a) Cone
   (b) Cylinder
   (c) Prism
   (d) Sphere

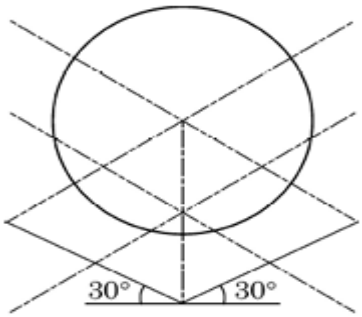
4. A drawing which shows how parts are put together is known as:
   (a) Perspective drawing

   (b) Assembly drawing

   (c) Detail drawing

   (d) Isometric drawing

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

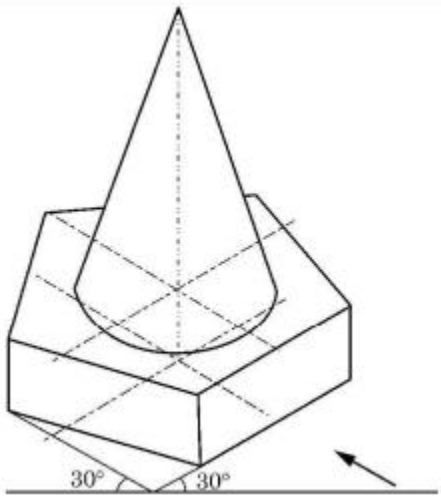


Isometric Projection

(i) The diameter of sphere in isometric projection, is foreshortened
(ii) The isometric projection of sphere is a circle
(iii)The isometric projection of sphere is an ellipse
(iv) The diameter of sphere in isometric projection remains same.

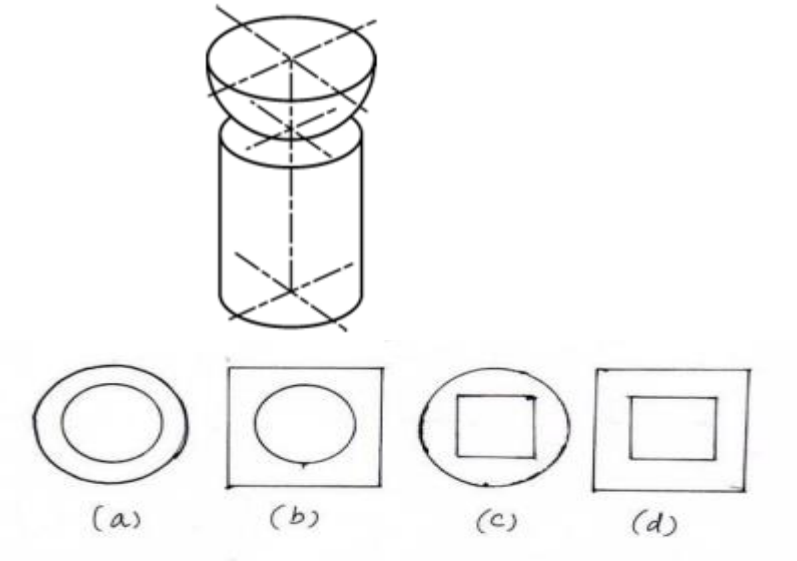
(a) (i) and (iv) only
(b) (ii) and (iii) only
(c) (ii) and (iv) only
(d) (iii) and (iv) only

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

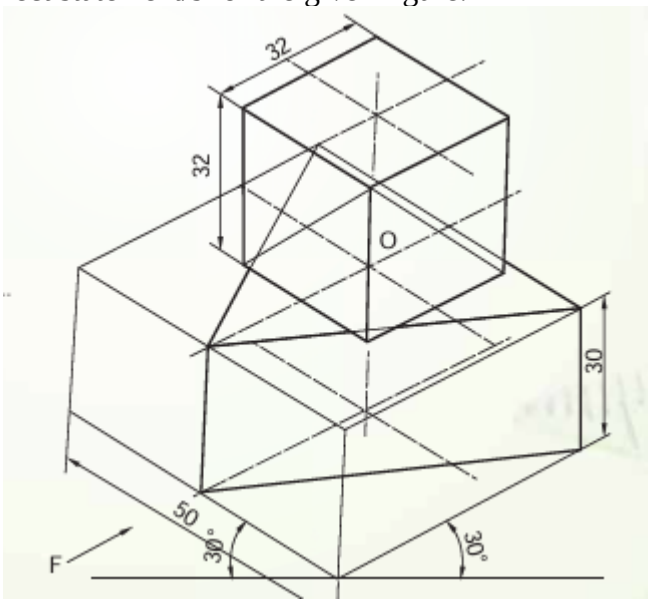


(i) A cone is kept on a pentagonal slab when one of the base edges of the prism parallel to VP and nearer to the observer.
(ii) A cone is kept on a pentagonal pyramid when one of its base edges parallel to VP and away from the observer.
(iii) A cone is kept on a pentagonal pyramid when one of the base vertices of the pyramid is at the rear.
(iv) 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

7. Select the top view of given combination of solids.

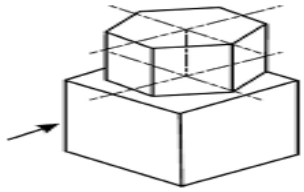
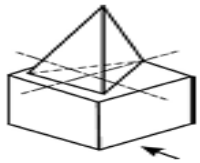
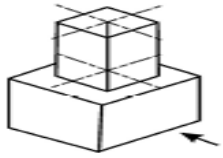
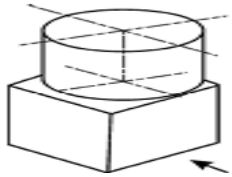
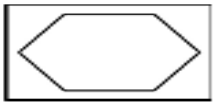
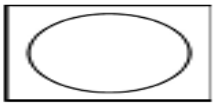
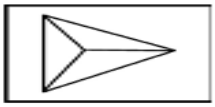
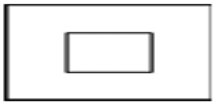


8. Choose the incorrect statement/s for the given figure.



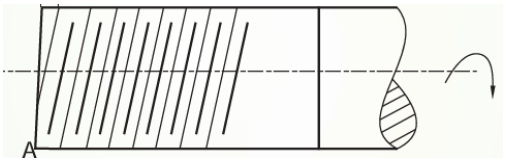
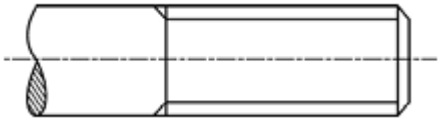
(i) Both solids are triangular prisms
(ii) Bottom solid is a triangular prism and top solid is a cube
(iii) Common axis of both the solids are perpendicular to HP
(iv)The top solid is an inverted square pyramid
(a) (i) only
(b) (ii) and (iii) only
(c) (i) and (iv) only
(d) (ii) and (iii) only

9. Match the LIST I with LIST II

LIST 1: ISOMETRIC PROJECTION OF SOLIDS	LIST II: TOP VIEW IN ORTHOGRAPHIC PROJECTION (Figure not to scale)
1.  2.  3.  4. 	(i)  (ii)  (iii)  (iv) 

(a) 1-(iii), 2-(iv), 3-(i), 4-(ii)
(b) 1-(i), 2-(iii), 3-(iv), 4-(ii)
(c) 1-(iv), 2-(ii), 3-(iii), 4-(i)
(d) 1-(ii), 2-(iv), 3-(i), 4-(iii)

10. Match the LIST I with LIST II

LIST I: CONVENTIONAL REPRESENTATIONS	LIST II: COMPONENTS
1. 	(i) rods of square cross section
2. 	(ii) external V thread (LH)
3. 	(iii) round rod with external threads
4. 	(iv) round rod without external thread

(a) 1-(iv), 2-(i), 3-(ii),4-(iii)
(b) 1-(iii), 2-(ii), 3-(i), 4-(iv)
(c) 1-(ii), 2-(i),3-(iv),4-(iii)
(d) 1-(ii),2-(iv),3-(i),4-(iii)

11.A machine element which supports and guides a rotating shaft is called --------
(a) pulley
(b) bearing
(c) cotter
(d) coupling

12. What is the thread angle of a Metric thread?
(a) 35°
(b) 40°
(c) 55°
(d) 60°

13.The surface connecting crest and root is called as ----------
(a) Stud
(b) Flank
(c) Pitch
(d) Lead

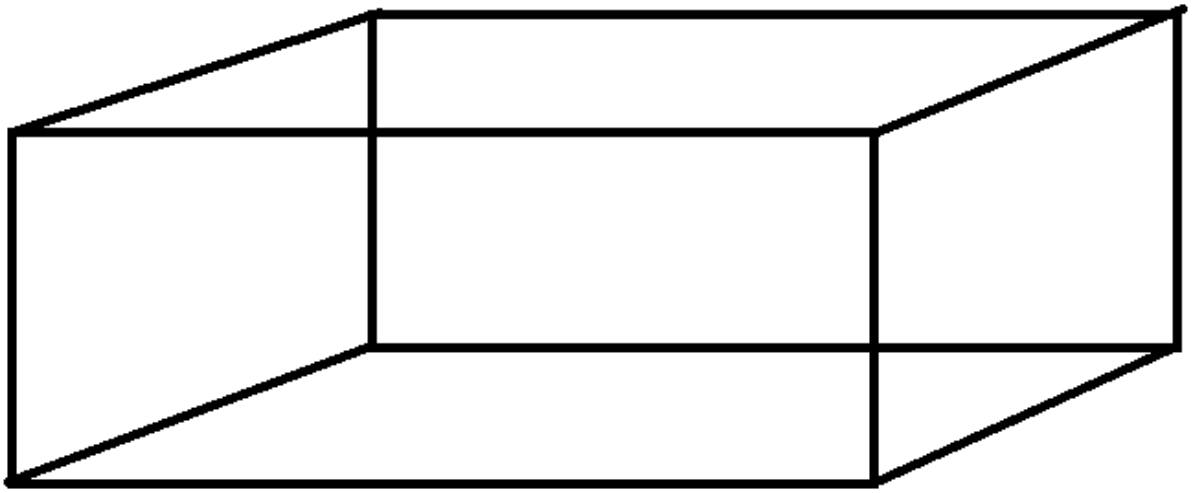
14.The portion of the shaft in the sleeve is called the----------
(a) Bush
(b) Journal
(c) Snug
(d) Oil hole

SECTION B

Q.15 to Q.18 : Read the following paragraph and answer the questions given below:

4 X 1 = 4

You are tasked with designing a storage box that will be manufactured for a new line of office supplies. The box is a rectangular prism with specific dimensions. You need to create an isometric projection to present your design to the production team.



15. For creating the isometric projection, which type of scale is used?
    (a) Vernier scale
    (b) Isometric scale
    (c) True scale
    (d) Nominal scale

16. After creating the isometric projection of the rectangular prism, the length, height and width will be ----------
    (a) Equally foreshortened
    (b) Doubled
    (c) Halved
    (d) Remains the same

17.Isometric projection is a ---------- projection.
    (a) One dimensional
    (b) Three dimensional
    (c) Two dimensional
    (d) None of the above

18.Which type of projection is extensively used in mechanical engineering and design field?

(a) Orthographic projection
(b) Oblique projection
(c) Perspective projection
(d) Axonometric projection

Q.19 to Q.22 : Read the following paragraph and answer the questions given below:

4 X 1 = 4

Aravind went to an automobile shop with his father, he observed many small machine parts which is arranged in the rack. Some of them are with different shapes of head, some of them are without head, some with external threads etc. These machine parts are used to connect two parts together in which some are known as temporary fasteners and others are called as permanent fasteners.

19. Nut end and metal end comes in which type of machine part?
(a) Machine screw
(b) Rivet
(c) Stud
(d) Nut

20. Snap head, pan head, flat head are some of the types of ---------
(a) Machine screws
(b) Rivet heads
(c) Studs
(d) Bolts

21. The outer diameter of head in countersunk head machine screw of size M20 is ----------
(a) 20
(b) 36
(c) 16
(d) 17

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

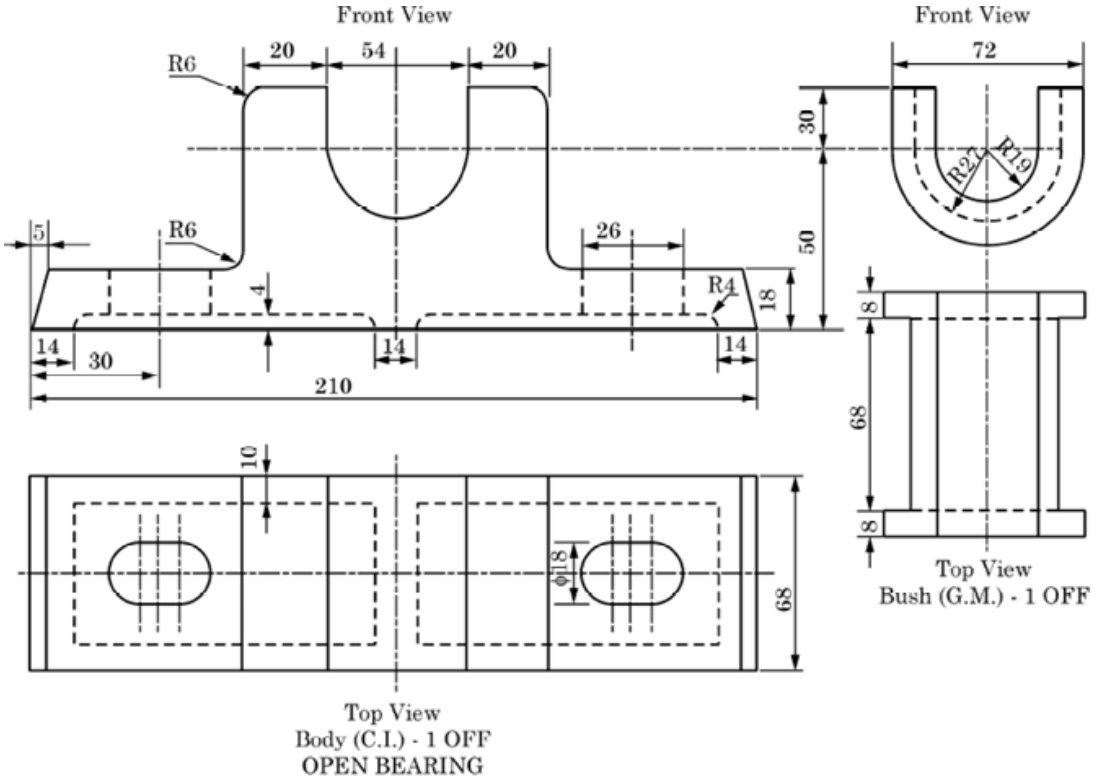
(a) Pan head rivet
(b) Collar stud
(c) Grub screw
(d) Snap head rivet

23.(a) The figure shows the details of the parts of an Open bearing. Assemble these parts correctly and then draw the following views to scale 1:1.

(a) Front view, right half in section **(13)**

(b) Left hand side view **(8)**

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



NOTE : Figure not to Scale. Use dimensions given for Solution.

OR

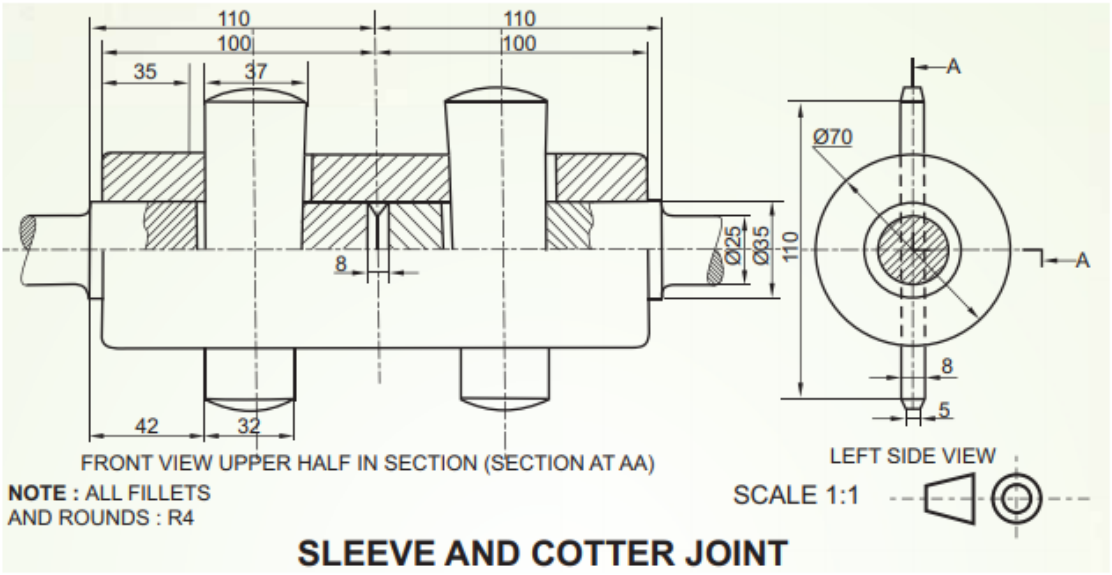
23.(b) The figure given below shows the assembly of a sleeve and cotter joint, Disassemble the following parts and draw the following views to a full-size scale.

(a) Front view of sleeve and side view of sleeve viewing from left side (8)

(b) Front view of Shaft A and Shaft B, Side view viewing from left side. (7)

(c) Front view of cotter in vertical position and its top view. (6)

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



SECTION C

24. (a) Construct an isometric scale **1 x 4 = 4**

1 x 9 = 9

(b) Draw the isometric projection of an inverted hexagonal pyramid of base edge 30 mm and height of 60 mm keeping two of its base side parallel to the V.P. Indicate the direction of viewing and give all the dimensions.

1 x 8 = 8

25.(a) Draw to scale 1:1, the standard profile of BSW thread with enlarged pitch as 50 mm. Give standard dimensions.

OR

25. (b) Draw to scale 1: 1, the front view and side view of a hexagonal headed bolt (diameter 30 mm). Keep its axis horizontal, take the length of the bolt as 120mm. Give standard dimensions.