

Question Paper 2010 Delhi set 1
CBSE Class 12 ENGINEERING DRAWING

Note:

- Attempt all the questions.
- Use both sides of the drawing sheet, if necessary.
- All dimensions are in millimeters.
- Missing and mismatching dimensions, if any, may be suitably assumed.
- Follow the SP : 46-1988 codes
- (with First Angle method of projection).
- In no view of questions 1 and in no sectioned view of question 3, are hidden edges / lines required.

1. (a) Construct an isometric scale, 90 mm long. [4]

(b) Construct the isometric projection, to isometric scale, of a pentagonal pyramid (base edge = 40 mm and height = 90 mm), keeping it in the inverted position. The axis is perpendicular to H.P. One of its base edges is parallel to V.P. and away from that. Draw the axis and indicate the direction of viewing. Give all dimensions. [8]

(c) A cone (diameter = 40 mm and height = 60 mm) is placed, centrally, with its base on the hexagonal face of a hexagonal prism (base edge = 40 mm and height = 25 mm). The common axis is perpendicular to H.P. The base of the prism is on H.P., and one of the base edges is perpendicular to V.P. Draw the isometric projection of the solids, placed together, to isometric scale. Draw the common axis and indicate the direction of viewing. Give all dimensions. 13409

Ans. ISOMETRIC SCALE

- (a)** (i) Marking of divisions of 10 mm, 1 mm on true scale and marking angles of 30° & 45°.
(ii) Projections from scale 1:1 to get points on Isometric scale.
(iii) Construction of Isometric scale with main divisions of 10 mm each.(iv) Division of the first part into 10 sub-divisions.

(v) Printing “Scale 1:1” and ‘Isometric Scale’

(b) ISOMETRIC PROJECTION OF AN INVERTED PENTAGONAL PYRAMID

- (i) Helping view (with isometric scale or scale 1:1) of pentagon with a side, parallel to V.P. and away from it.
- (ii) Drawing isometric pentagon on top.
- (iii) Drawing slant edges.

(c) CONE PLACED, CENTRALLY, ON A HEXAGONAL PRISM. (13)

(A) HEXAGONAL PRISM (7)

- (i) Helping view of hexagon with a side perpendicular to V.P.
- (ii) Drawing isometric hexagons
- (iii) Drawing face edges, parallel to vertical axis/V.P.
- (iv) Dimensioning the edge of the base and axis, i.e. height of prism.

(B) CONE AND DIRECTION OF VIEWING (6)

- (i) Drawing elliptical curve for base
- (ii) Drawing tangents to curves, i.e. generators
- (iii) Indicating the common axis of two solids
- (iv) Dimensioning of diameter and axis
- (v) Direction of viewing

Note: For incorrectly placed solids, etc., proportionate deductions, as proposed in Q.1 (b) may be used.

2. (a) Draw to scale 1 : 1, the standard profile of a metric thread (internal), taking enlarged pitch = 40 mm. Give standard dimensions. [9]

OR

Draw to scale 1 : 1, the front view and top view of a Tee bolt of size M 20. Keep the axis vertical. Give standard dimensions.

(b) Sketch freehand the front view and top view of a grub screw of size M 25. Keep the axis vertical. Give standard dimensions. [6]

OR

Sketch freehand the front view and the top view of a pan head rivet, shank diameter = 20 mm. Keep the axis vertical. Give standard dimensions.

Ans. (a) METRIC SCREW THREAD PROFILE (INTERNAL)

- (i) Distance, equal to pitch, marked correctly and angles of 60° , drawn correctly
- (ii) Flat edges and curves for threads (minimum 2), drawn correctly
- (iii) Side edges (flanks), drawn correctly
- (iv) Dimensioning
- (v) Neatness and line work

OR

TEE BOLT (9)

FRONT VIEW

- (i) Threaded and unthreaded portions of cylindrical shank, square neck and center line.
- (ii) Head of bolt

TOP VIEW

- (i) Circles of diameter 'd' and $0.85d$ (thin and broken)
- (ii) Square neck and rest of the portion

Details:

- (i) Dimensioning
- (ii) Neatness and line work

Note: 3 marks may be deducted, in all, if sketched freehand, instead of drawing to scale 1:1.

(b) FOLLOWING COMPONENTS ARE TO BE SKETCHED FREEHAND PROPORTIONATELY:

GRUB SCREW (SIZE M25)

- (i) Front view with its axis, perpendicular to H.P.

- (ii) Top view
- (iii) Dimensions

OR

PAN HEAD RIVET (for a diameter of rivet of 25 mm)

FRONT VIEW

- (i) Sketching the head with correct proportions.
- (ii) Sketching cylindrical portion, broken end and hatching

TOP VIEW

- (i) Two circles
- (ii) Dimensioning

Note: 2 marks may be deducted, if these components are drawn with instruments, instead of being sketched freehand.

3. Fig. 1 shows the details of a Plummer block. Assemble the parts correctly and draw, to scale 1 : 1, the front view, right half in section. [24]

Print title and scale used.

Give 8 important dimensions. [6]

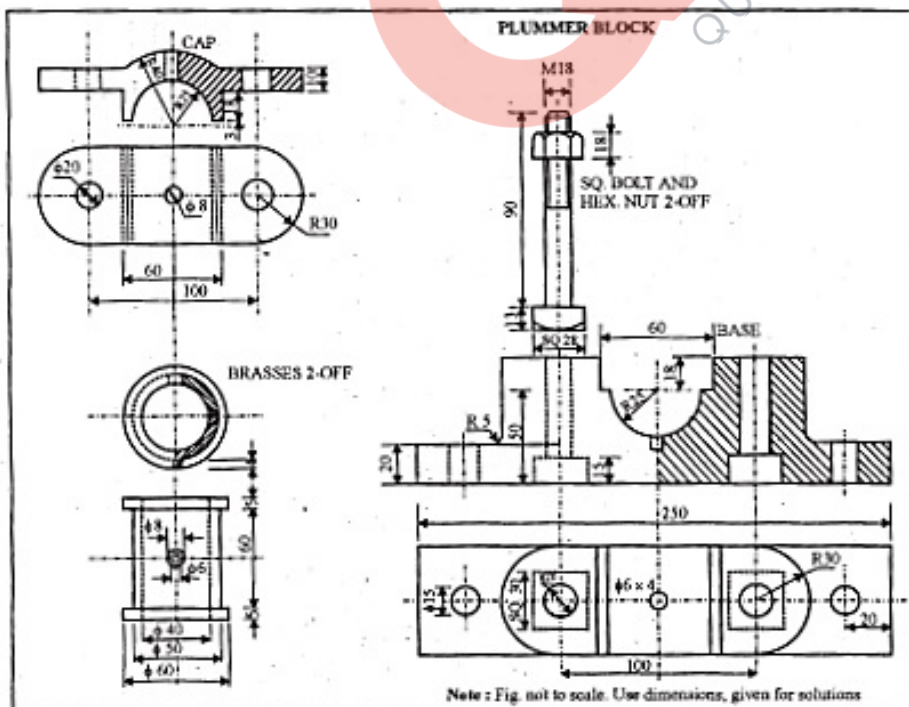


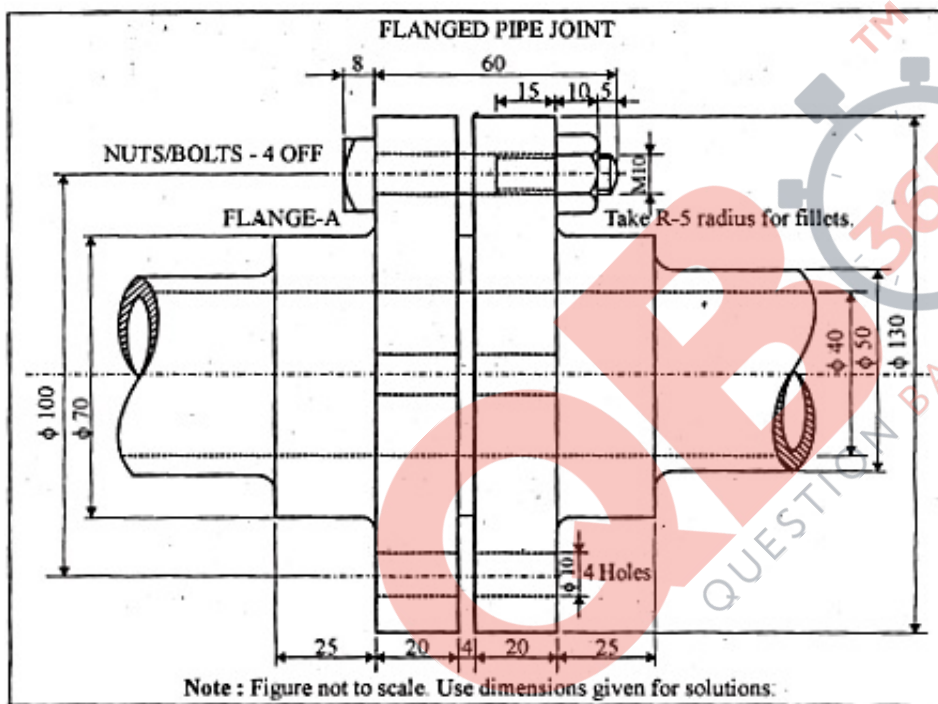
Fig. 2 shows, partly, the assembly of a flanged pipe joint. Disassemble the parts and then draw the following views, to scale 1 : 1. Keep the same position of the parts with respect to H.P. and V.P. :

(a) Front view of the flange A, showing the top half in section and side view, as seen from the left. [16]

(b) Front view of any hexagonal nut and the side view, as seen from the right.

Print titles of both and scale used. [8]

Draw the projection symbol. Give 8 important dimensions. [6]



Ans. PLUMMER BLOCK (Assembly) (30)

(A) FRONT VIEW, RIGHT HALF IN SECTION (15)

(i) Base:

(a) Right half in section with two holes with their axes.

(b) Left half, without section, with properly located axes for holes.

(ii) Brasses (Upper & lower):

(a) Drawn in correct position with right half in section along with oil

hole and snug.

(b) Left half without section

(iii) Cap:

(a) Right half in section with holes for bolt and oil.

(b) Left half without section.

(iv) Square headed bolts:

(a) Full bolt on the right.

(b) End of bolt, coming out of nut, on the left, along with shank between the base and the cap

(v) Hexagonal nuts: One nut, placed properly, on each side 3

(B) DETAILS:- (6)

(i) Neatness and line work.

(ii) Printing title and scale used

(iii) Showing 8 dimensions

OR

FLANGED PIPE JOINT (Dis-assembly)

(A) FLANGE A (

FRONT VIEW, TOP HALF IN SECTION

(i) Boundary with conventional representation of end of pipe

(ii) Properly located axes of pipe and two holes for bolts

(iii) Line indicating inner radius of pipe, hatching lines and holes

(iv) Remaining two vertical lines in lower half

SIDE VIEW, AS SEEN FROM THE LEFT

- (i) Four circles, axes and the hatching lines
- (ii) Drawing four holes for bolts and the pitch circle
- (iii) Drawing cutting plane XX' for the front view
- (iv) Neatness and line work

(B) HEXAGONAL NUT

FRONT VIEW

- (i) Drawing horizontal axis, one vertical line for base of nut and four horizontal lines
- (ii) Drawing curves for chamfer of nut, the associated vertical line and chamfer lines

SIDE VIEW, AS SEEN FROM THE RIGHT

- (i) Drawing the chamfer circle, two circles – one broken and other full and the circumscribing hexagon.
- (ii) Drawing the horizontal and the vertical axis.
- (iii) Neatness and line work

DETAILS (6)

- (i) Printing titles
- (ii) Projection symbol
- (iii) Scale used
- (iv) Dimensioning

