



C14-C-607

4721

**BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2018
DCE—SIXTH SEMESTER EXAMINATION
STRUCTURAL ENGINEERING DRAWING**

Time : 3 hours]

[*Total Marks* : 60

PART—A

4×5=20

- Instructions** : (1) Answer **all** questions.
(2) Each question carries **four** marks.
(3) Any missing data may be assumed suitably.

1. Draw the layout plan indicating the position of columns and beams with orientation for the line diagram given below :

Bed Room 4.00 m × 3.5 m	Kitchen 3.0 m × 3.5 m
Bed 3.0 m × 3.00 m	Verandah 4.00 m × 3.00 m

2. Draw the longitudinal section of the T-beam with the following specifications :

Clear span of the T-beam : 5200 mm
Bearing on walls : 230 mm
Thickness of roof slab : 140 mm

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Overall depth of T-beam : 450 mm
(including slab thickness)
Width of rib : 230 mm

Reinforcement :

Main bars : 16 mm dia, 04 Nos. (out of which two bars cranked at a distance of 700 mm from the face of the support)

Hanger bars : 12 mm dia. 2 Nos.

Stirrup : 8 mm dia, 2-legged at 200 mm c/c

Covers :

Bottom and top-clear cover : 25 mm

End cover : 40 mm

3. Prepare bar bending schedule and find the total quantity of steel required for main reinforcement of lintel shown in the Fig. 1 below. Top and bottom covers are 25 mm and side cover is 40 mm :

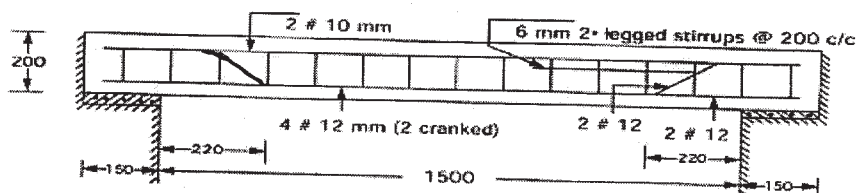


Fig. 1

4. The plan and section of isolated square footing for a column is shown in Fig. 2. Specify the reinforcement details for the following :

(a) Reinforcement details for footing in both directions

(b) Reinforcement details for column

(c) Total quantity of steel for footing

(wt. of 12 mm bar = 0.89 kg/m)

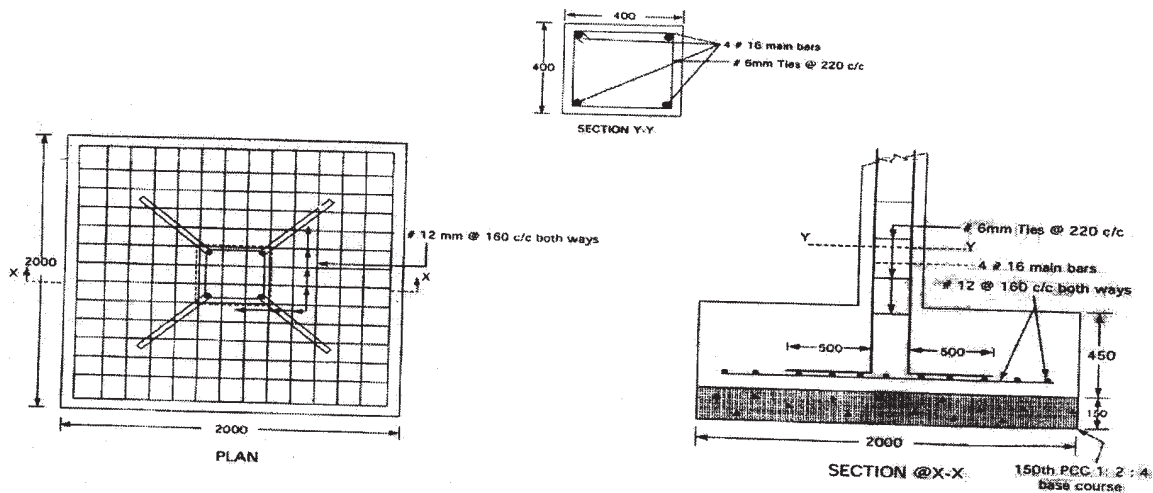


Fig. 2

5. Draw the elevation (front view) of a built-up column with lacing system from given specifications.

Specifications :

Overall height of the column is 5000 mm consists of 2 Nos., ISMC 350@42.1 kg/m placed back-to-back keeping a clear distance of 180 mm between the webs. The column is provided with single lacing system. The sizes of lacing flats are 50 mm × 10 mm thick. Lacing is at an angle of 45° with the axis of the column.

Spacing between the consecutive lacing connections is 600 mm, 6 mm fillet weld of 100 mm length is provided at lacing connection with the main component. At the end of column, 320 mm × 150 mm × 10 mm plates are provided and are connected with 6 mm fillet weld all-round.

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PART—B

20×2=40

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **twenty** marks.
(3) The drawing must be to the scale.
(4) Any missing data may be assumed suitably.

6. The reinforcement details of a simply supported one way slab with the following specifications :

Specifications :

- (i) Clear span (shorter) = 2.8 m
(ii) Clear span (longer) = 6.0 m
(iii) Bearings on all the sides = 230 mm
(iv) Overall depth of the slab = 130 mm
(v) Steel : Main bars # 10 at 170 mm c/c. All main bars are cranked on one side alternatively at a distance of 280 mm from the face of the support.
Distribution bars #8 at 200 mm c/c.
Hanger bars 3#8 on each side (to support cranked bars)
(vi) Covers : Bottom clear cover = 20 mm
Top clear cover = 20 mm
Side covers = 25 mm
(vii) Materials : M20 grade concrete, Fe415 steel

Draw to a suitable scale—

- (a) nottom plan of the reinforcement;
(b) cross-section along the short span;
(c) cross-section along the longer span.

10+5+5=20

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7. Draw the plan, front elevation, side elevation of a column base with gusset plate from the following specifications : 7+7+6=20

The column section consists of ISWB 450@92.5 kg/m and flange plates each 325 mm × 12 mm on each side of column.

Size of the baseplate is 700 mm × 600 mm × 18 mm. Column is proportioned such that web of the column is parallel to 700 mm side.

Thickness of the gusset plate is 12 mm, total depth is 300 mm and length is 600 mm and placed parallel to the flange. The edges are splayed out at a slope such that the height at the edge is 100 mm.

Welded connections 6 mm fillet weld. Six anchor bolts are provided to anchor the baseplate to the concrete pedestal.
