



c09-c-607

**3728**

**BOARD DIPLOMA EXAMINATION, (C-09)**

**OCT/NOV—2015**

**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.

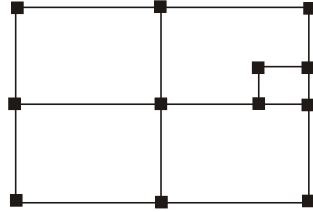
(3) Part—A may be drawn not to scale.

(4) Assume suitable data, if necessary.

- 1.** Draw the plan of the given line diagram by properly indicating the position of columns and beams :

ROOM 4.0 × 3.0 m	ROOM 4.0 × 3.0 m
ROOM 4.0 × 3.0 m	ROOM 4.0 × 3.0 m
ROOM 4.0 × 3.0 m	ROOM 4.0 × 3.0 m

- \* 2. Redraw the figure given below and show the column reference scheme and grid reference scheme.



3. Draw the sectional elevation of isolated square footing showing reinforcement details for a column with the following specifications :

*Specifications :*

Size of the column : 400 400 mm

Size of footing : 2000 2000 mm

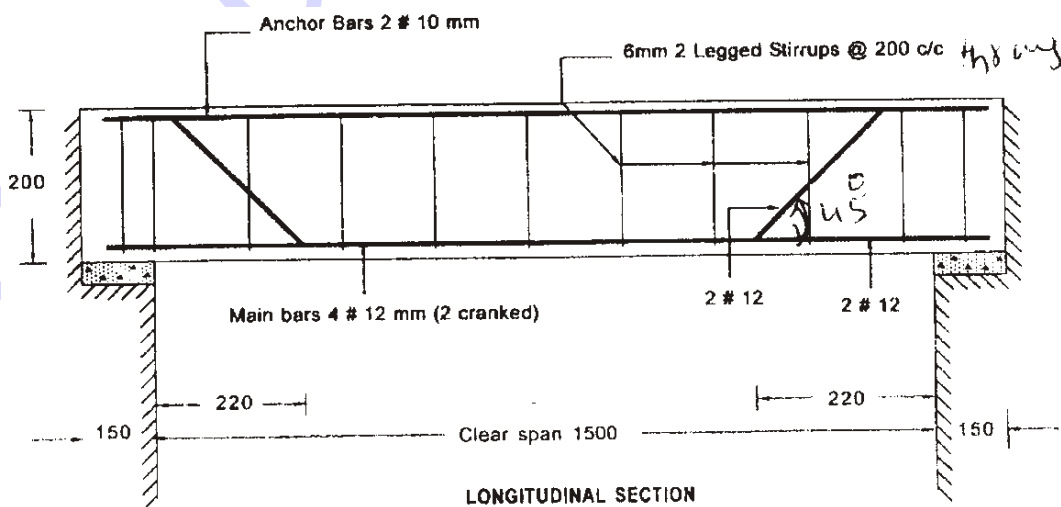
Thickness of footing : 450 mm

Reinforcement : For footing : 12 mm bars @ 150 c/c both ways

For column : 4 bars of 16 mm dia with lateral ties 8 mm @ 200 c/c

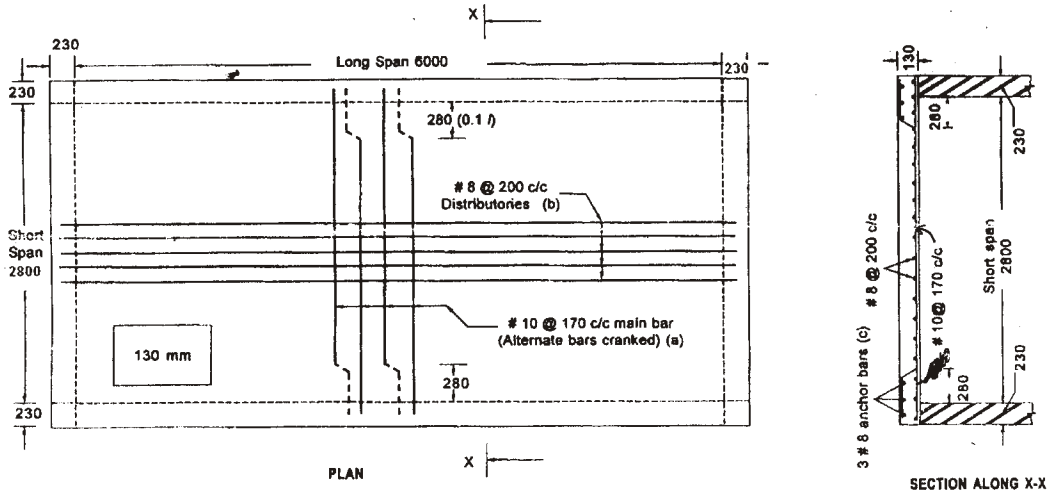
4. Prepare bar bending schedule to calculate the steel required for main steel and anchor bars for the simply supported lintel beam shown. Consider all covers : 25 mm.

weight of # 12 = 0.89 kg/m, # 10 = 0.62 kg/m.



- \* 5. Prepare bar bending schedule and find the total quantity of steel required for the simply supported one way slab which is shown below. Consider all covers to be 20 mm.

Weight of # 10 = 0.62 kg/m; # 8 = 0.39 kg/m



### PART—B

20×2=40

**Instructions :** (1) Answer **all** questions.

(2) Each question carries **twenty** marks.

(3) Assume suitable data, if necessary.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. Draw the reinforcement details of a simply-supported two-way slab whose corners are held down with the following specifications :

10+10

(a) Bottom plan of the reinforcement

(b) Cross section along the long span at mid span

Specifications : Size of the room : 4.8 × 6.2 m with overall depth of slab 170 mm and bearing on walls : 300 mm

Reinforcement : Along shorter span

In the middle strip : 12 mm @ 180 c/c

In the edge strip : 12 mm @ 300 c/c

\*

(Alternate bars are cranked at a distance of 480 mm from the face of the support)

Along longer span :

In the middle strip : 12 mm @ 220 c/c

In the edge strip : 12 mm @ 300 c/c

(Alternate bars are cranked at a distance of 620 mm from the face of the support)

Torsion reinforcement : In the form of mesh 990 × 990 mm in four layers with 8 mm bars 10 nos in each layer at all the four corners.

Covers : All covers 20 mm

7. Draw the reinforcement details of a longitudinally spanned dog-legged staircase with the following specifications : (longitudinal section for single flight only)

(i) Size of the staircase room 2500 × 4170 mm

(ii) Height of the floor : 3600 mm

(iii) Tread (*T*) : 270 mm

(iv) Rise (*R*) : 150 mm

(v) Thickness of waist slab : 200 mm

(vi) Bearing in the wall : 300 mm

(vii) Thickness of the wall : 300 mm

(viii) Projection into the basement : 300 × 300 mm

(ix) Width of the staircase and width of landing : 1200 mm

Reinforcement :

(i) Main bars : 12 mm at 160 mm c/c (alternate bars cranked at  $L/7$  from the bottom end)

(ii) Distribution bars : 8 mm dia @ 170 mm c/c

(iii) Additional bars of 12 mm dia at 320 mm c/c at the junction of landing slab with the waist slab. Project these bars through a distance of 1000 mm from the junction point downwards parallel to the waist slab.

Covers : All covers 25 mm

Materials : M 20 grade concrete and steel : Fe-415

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