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3728

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL-2019

DCE – SIXTH SEMESTER EXAMINATION

STRUCTURAL ENGINEERING DRAWING

Time: 3Hours

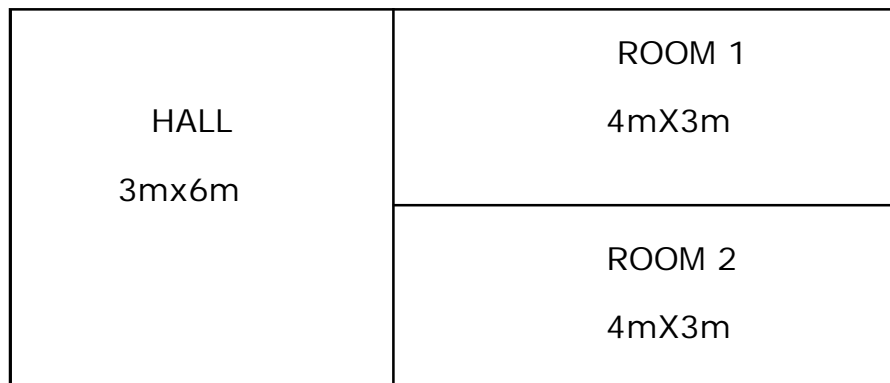
Max. Marks: 60

PART-A

5x4=20M

- Instructions:** 1) Answer **all** the questions.
 2) Each question carries **four** marks
 3) Part A may be drawn not to scale.
 4) Assume suitable data if necessary.

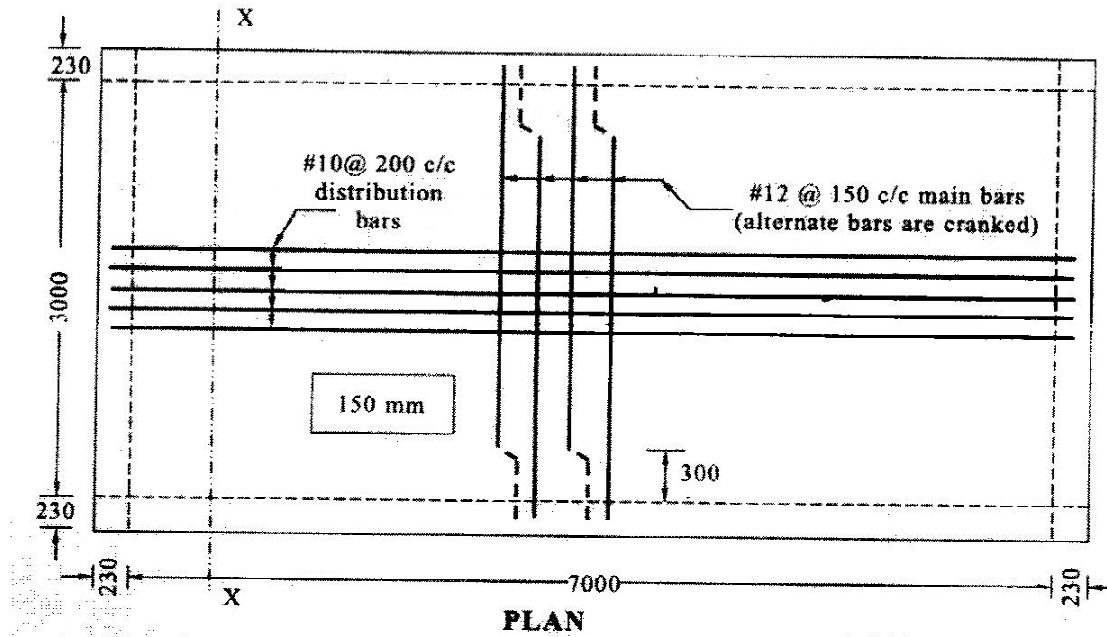
- 1) What is structural planning of a building and write down in four steps?
- 2) Draw the layout plan indicating the position of beams and columns with orientation for the line diagram given below and Name them by "column reference scheme"?



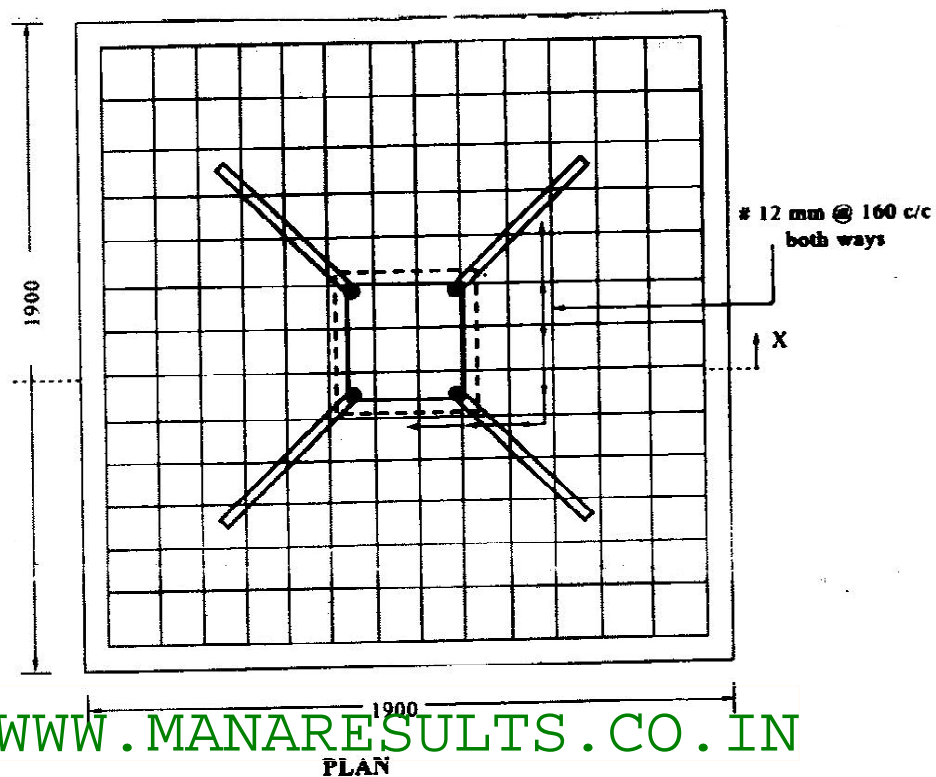
- 3) Draw the details of reinforcement at the end junction of column and beam of a frame designed as earthquake resistant structure?

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- 4) Prepare the bar bending schedule and find the quantity of steel required for the main reinforcement for the one way slab shown in the figure below. Top and bottom covers are 20 mm each and end cover is 40mm.



- 5) Prepare the bar bending schedule for the footing shown in figure below. Also estimate the quantity of steel required for the footing. Bottom clear cover = 25 mm and end cover = 40mm.



PART-B

2x20=40

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- Instructions:** 1) Answer **all** questions
2) Each question carries **twenty** marks
3) Assume suitable data if necessary
4) Assume suitable scale.

- 6) A singly reinforced rectangular beam of width 230 mm and gross depth 400 mm is simply supported over a clear span of 3200 mm. Bearing on each side is 230 mm. It is reinforced with 4 no's of 16 mm diameter bars with a clear cover of 25 mm and 2 anchor bars of 12 mm diameter are provided. Middle two bars of tension reinforcement are cranked through 45° at a distance of 0.1 times the clear span from the face of the support. To resist shear, two legged stirrups of 8 mm dia. at 220mm c/c are provided. All the remaining covers are 40 mm each.

The materials used are M 20 grade concrete and Deformed bars of grade Fe 415. Draw the following views showing the reinforcement details with the above specifications to a suitable scale.

- (i) Longitudinal section 10 Marks
(ii) Cross section at the middle span 5 Marks
(iii) Cross section at the end span 5Marks

- 7) Draw the longitudinal section of the stair case spanning longitudinally with the specifications given below.

(i) Specifications:

Size of the stair case room	: 4000x2500 mm (inside)
Level difference between the floors	: 3600 mm
Width of the stair	: 1200 mm
Landing width	: 1000 mm
Tread	: 270 mm
Rise	: 150 mm
Thickness of waist slab	: 200 mm
Bearing on wall	: 230 mm
Thickness of wall	: 230 mm
Projection into the basement	: 300mm x 300 mm

(ii) Materials:

Concrete	: M 20 grade
Steel	: Fe 415 grade

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(iii) Reinforcement details:

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Main reinforcement : # 12 at 160 mm c/c (alternate bars are cranked at a distance of L/7 from bottom end)
- Distribution bars : # 10 at 200 mm c/c
- Additional bars : # 12 at 160 mm c/c (at the junction of landing slab with waist slab and extend these bars through a distance of 1000 mm from the junction point down words into waist slab)

(iv) Covers:

- Bottom clear cover : 20 mm
- All the remaining covers : 40 mm

Draw the longitudinal section of staircase spanning longitudinally showing the reinforcement details to a suitable scale.

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