C16–C–406

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BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2018
DCE—FOURTH SEMESTER EXAMINATION

CIVIL ENGINEERING DRAWING–II

Time : 3 hours]   [*Total Marks* : 60

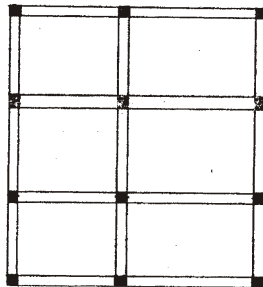**PART—A**   4×5=20

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. Redraw the fig. given below and name the columns and beams as per the 'column reference scheme'.


2. State any four guiding principles for positioning of beams in the structural planning of the building.

3. Draw the plan of staircase room from the following specifications :

Size of staircase room	: 3000 mm × 50000 mm
Height of the floor	: 3600 mm
Tread	: 270 mm
Rise	: 150 mm
Thickness of wall	: 350 mm
Width of staircase	: 1200 mm

4. Prepare the bar bending schedule and find the quantity of steel required for the simply supported beam shown in the figure below. Top and bottom covers are 25 mm and side cover is 40 mm.

LONGITUDINAL SECTION

SECTION @ X X   SECTION @ Y Y
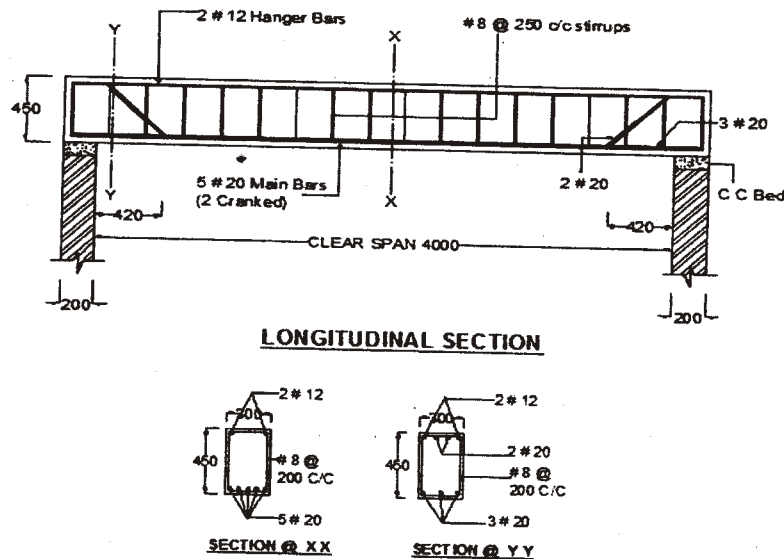
5. Prepare a bar bending schedule for the one-way slab, with the following data :

Size of room	: 3200 mm × 1200 mm (inside)
Wall thickness	: 230 mm
Slab thickness	: 120 mm
Main reinforcement	: 10 mm dia. bars at 120 mm c/c. All the bars are cranked on one side and cranks placed alternately
Distribution reinforcement	: 6 mm dia. bars at 180 mm c/c. All covers are of 25 mm

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

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

(3) Assume suitable data, if necessary.

(4) Assume suitable scale.

6. An RCC lintel with sunshade has the following specifications :

Clear span of lintel	: 1500 mm
Width of wall	: 230 mm
Size of lintel	: 230 mm × 200 mm
Bearing on walls	: 150 mm
Projection of sunshade from face of the wall	: 600 mm
Thickness of sunshade	: 100 mm to 50 mm

Reinforcement of Lintel :

Main reinforcement	: 3 nos. of 12 mm dia (all straight bars)
Hanger bars	: 2 nos. of 10 mm dia
Stirrups	: 6 mm dia. 2-legged at 150 mm c/c

Reinforcement of Sunshade :

Main bars	: 10 mm dia bars at 140 mm c/c
Distribution steel	: 6 mm dia @ 120 mm c/c

Draw to a scale of 1 : 10 :

(a) Longitudinal section of lintel   10

(b) Cross-section of lintel with sunshade   10

7. Draw the reinforcement details of a simply supported RCC two-way slab whose corners are free to lift, with the following specifications :

(a) *Specifications* :

Size of the room—4·0 m × 5·0 m

Edge conditions—simply supported, corners not held down

Overall depth of slab—140 mm

Bearing on walls—230 mm

(b) *Materials* :

Concrete—M-20 grade
Steel—Fe 415

(c) *Reinforcement* :

Along shorter span—# 12 at 200 mm c/c (alternate bars are cranked at a distance of 400 mm from the face of the support)

Along longer span—# 10 at 250 mm c/c (alternate bars are cranked at a distance of 500 mm from the face of the support)

Provide 3#8 hanger bars at each edge to keep top bars in position.

(d) *Covers* :

Bottom clear cover 12 mm
Top clear cover 12 mm
End covers 20 mm

 (i) Bottom plan of the reinforcement

(ii) Top plan of the reinforcement

(iii) Cross-section along the shorter span at mid-span

10+5+5

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