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**BOARD DIPLOMA EXAMINATION, (C-16)
JANUARY/FEBRUARY—2022
DCE - FOURTH SEMESTER EXAMINATION
CIVIL ENGINEERING DRAWING – II**

Time : 3 hours]

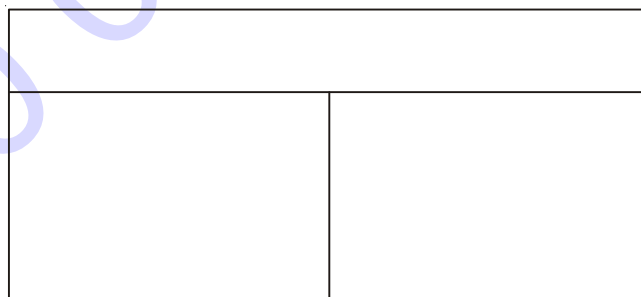
[Total Marks : 60

PART—A

4×5=20

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

- 1.** Mark the position of the columns in the given diagram and name the columns as per “Grid Reference Scheme”.



- 2.** State any four guiding principles for positioning of beams in the structural planning of the buildings.

3. Prepare the bar bending schedule and find the quantity of steel required for simply supported beam with the following data :

Clear span : 4500 mm

Size of beam : 300 mm × 500 mm

Main bars : 4 nos of 12 mm dia (all straight bars)

Hanger bars : 2 nos. 10 mm dia

Stirrups : 6 mm dia 2-legged bars at 180 mm c/c

4. Draw the cross-section of square column footing with the following specifications :

Size of column : 300 mm × 300 mm

Size of footing : 1500 mm × 1500 mm

Thickness of CC bed : 200 mm

Thickness of footing at free end : 150 mm

Tapered portion height : 50 mm

All covers : 50 mm

Reinforcement : In footing 12 mm dia @ 150 mm c/c in both ways

In columns 4 nos. 16 mm dia with lateral ties of
8 mm dia @ 150 mm c/c

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

Size of staircase room : 4000 mm × 2500 mm

Height of the floor : 3600 mm

Tread : 270 mm

Rise : 150 mm

Thickness of wall : 300 mm

Width of staircase : 1200 mm

Landing width : 900 mm

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PART—B

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **Twenty** marks.
(3) Draw questions to suitable scale. Assume suitable data if necessary.

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

(a) *Specifications :*

Size of the room—4·0 m × 4·5 m

Edge conditions—simply supported, corners not held down

Overall depth of slab—120 mm

Bearing on walls—230 mm

(b) *Materials :*

Concrete—M-20

Grade steel—Fe 415

(c) *Reinforcement :*

Along shorter span—#10 at 150 mm c/c (alternate bars are cranked at a distance of 400 mm from the face of the support)

Along longer span—#10 at 200 mm c/c (alternate bars are cranked at a distance of 450 mm from the face of the support)

Provide 3 no. #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

Draw to a suitable scale :

- | | |
|---|----|
| (i) Bottom plan of the reinforcement. | 10 |
| (ii) Top plan of the reinforcement. | 5 |
| (iii) Cross-section along the shorter span at mid-span. | 5 |

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

- Clear span of lintel : 1300 mm
Width of wall : 230 mm
Size of lintel : 230 mm × 200 mm
Bearing on walls : 150 mm
Projection of sunshade
from face of wall : 600 mm
Thickness of sunshade: 75 mm to 50 mm

Reinforcement of lintel :

- Main reinforcement : 3 nos. of 12 mm dia (middle bar is cranked at a distance of 160 mm from either support)
Hanger bars : 2 nos. of 10 mm dia
Stirrups : 6 mm dia. 2-legged at 120 mm c/c

Reinforcement of sunshade :

- Main bars : 10 mm dia bars at 100 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

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