7624

BOARD DIPLOMA EXAMINATION, (C-20)

MAY/JUNE—2023

DCE - FIFTH SEMESTER EXAMINATION

STRUCTURAL ENGINEERING DRAWING

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

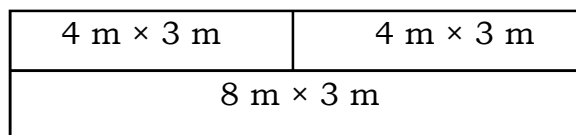
PART—A   10×2=20

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

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

(3) Part—A may be drawn not to scale.

(3) Assume suitable data, if necessary.

1. Draw the layout plan indicating the position of beams and columns with orientation for the line diagram given below and name them by *(a)* "column reference scheme" and *(b)* grid reference scheme.   5+5

4 m × 3 m	4 m × 3 m
8 m × 3 m	

2. Prepare the bar bending schedule and find the total quantity of steel required for the one way slab with the following data :   4+6

Data :

Size of the room	:	2500 mm × 6000 mm (inside)
Wall thickness	:	300 mm (all round)
Overall depth of slab	:	130 mm

Main Steel	:	# 10 at 120 mm c/c, all the main bars are cranked on one side alternatively at a distance of 250 mm from the face of the support)
Distribution steel	:	# 8 at 200 mm c/c
Hanger bars	:	3#8 on each side to support cranked bars.

Bottom clear cover = 20 mm and

All the remaining covers are 25 mm each.

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

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

(3) Draw all questions to scale.

(4) Assume suitable data, if necessary.

3. Draw the plan and sectional elevation showing the reinforcement details of an isolated square footing for a column with the following specifications to a scale of 1 : 10. 10+10

(a) **Specifications :**

Size of the column : 300 mm × 300 mm

Size of the footing : 1600 mm × 1600 mm

Thickness of the footing : 400 mm (uniform)

Base coarse thickness : 150 mm with P.C.C. (1 : 3 : 6)

(b) **Reinforcement :**

(i) For footing : 12 mm dia. bars at 160 mm c/c in both directions at bottom with a clear cover of 40 mm, the horizontal lap length of the column reinforcing bar is 500 mm each.

(ii) For column : Main bars = 16 mm dia. bars, 4 numbers.

Lateral ties = 6mm dia. ties at 220mm c/c.

(c) **Covers :**

All the covers are 40 mm each.

(d) **Materials :**

Concrete : M 20 grade

Steel : Fe 415 grade

4. Draw the reinforcement details of a simply supported R.C.C two way slab whose corners are free to lift, with the following specifications.

(a) **Specifications :**

Size of the room	:	4200 × 5500 mm
Edge conditions	:	Simply supported, corners not held down
Overall depth of slab	:	140 mm
Bearing on walls	:	300 mm

(b) **Reinforcement :**

Along shorter span : # 12 at 180 mm c/c (alternate bars are cranked at a distance of 420 mm from the face of the support).

Along longer span : # 10 at 220 mm c/c (alternate bars are cranked at a distance of 550 mm from the face of the support).

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

(c) **Covers :**

Bottom and top clear cover	:	20 mm each
Side clear cover	:	25 mm

(d) **Materials :**

Concrete	:	M 20 grade
Steel	:	Fe 415 grade

Draw the following views to a suitable scale of 1 : 25

(i) Bottom plan of the reinforcement   10

(ii) Cross-section along the short span   10

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