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C16-C–406

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BOARD DIPLOMA EXAMINATION, (C-16)

JUNE/JULY—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) PART—A may be drawn *not* to scale.

(4) Assume suitable data, if necessary.

1. State any four guiding principles for position of the beams.

2. Mark the position of columns in the given diagram and name them as per "grid reference scheme".

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ROOM 1 3·60 × 3·60 m	ROOM 1 3·30 × 3·60 m
ROOM 1 3·60 × 3·00 m	ROOM 1 3·30 × 3·00 m

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3. Prepare a bar bending schedule and estimate the quantity of steel for the lintel with the following data :

Clear span	=	1500 mm
Size of the lintel	=	230×230 mm
Bearing on either side	=	150 mm
Main bars in tension zone	=	3 nos. of 12 mm dia. (all straight bars)
Hanger bars	=	2 nos. of 10 mm dia.
Stirrups 6mm dia. 2-legged bars @ 200 mm c/c		
All cover provided	=	20 mm each
Weight of #12	=	0·89 kg/m
Weight of #10	=	0·62 kg/m
Weight of #6	=	0·22 kg/m

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

Size of column	=	300×300 mm
Size of footing	=	1500×1500 mm
Thickness of CC Bed	=	150 mm
Thickness of footing at free end	=	300 mm
Tapered portion height	=	150 mm
All covers	=	50 mm

Reinforcement :

In footing : #12mm @ 150 mm c/c in both directions.

In columns : 8 nos. of 16 mm dia. with lateral ties of 8 mm dia. at 200 mm c/c.

5. Show how torsion reinforcement is provided in two-way slabs with corners held down assuming all the four edges are discontinuous.

PART—B

20×2=40

Instructions : (1) Answer all questions.

(2) Each question carries twenty marks.

(3) Draw all questions to scale.

(4) Assume suitable data, if necessary.

6. A singly reinforced rectangular beam of width 230 mm and gross depth 450 mm is simply supported over a clear span of 4000 mm. Bearing on each side is 230 mm. It is reinforced with 4 nos. of 16 mm dia. bars with a clear cover of 40 mm and 2 anchor bars of 12 mm dia. are provided.

Middle 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 2-legged stirrups of 8 mm dia. @ 200 mm c/c are provided. The end cover is 40 mm.

Draw the following views from the above specifications to suitable scale :

(a) Longitudinal section 10

(b) Cross-section at the middle span 5

(c) Cross-section at the end span 5

7. Draw the longitudinal section of staircase spanning longitudinally with the following specifications.

SPECIFICATIONS :

Size of the staircase room	=	4700×2100 mm
Height of the floor	=	3300 mm
Tread (*T*)	=	270 mm
Rise (*R*)	=	150 mm
Thickness of waist slab	=	175 mm
Bearing on walls	=	230 mm
Projection into the basement	=	300×300 mm

REINFORCEMENT DETAILING :

(a) Main reinforcement = 12 mm dia. at 100 mm c/c

(b) Distribution steel = 8 mm dia. at 150 mm c/c

(c) Additional bars = 12 mm bars at 140 mm c/c

(at junction of landing slab with waist slab)

Bottom and end clear cover to steel = 25 mm

Draw to a scale of 1 : 25

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