BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

DCE – FIFTH SEMESTER EXAMINATION

STRUCTURAL ENGINEERING DRAWING

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

PART—A   10×2=20
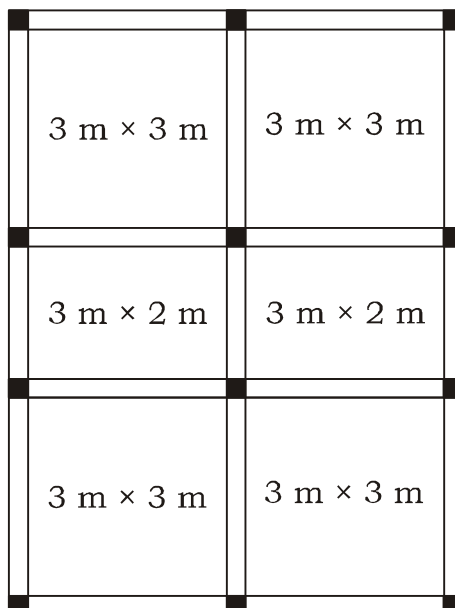
Instructions : (1) Answer **all** questions.

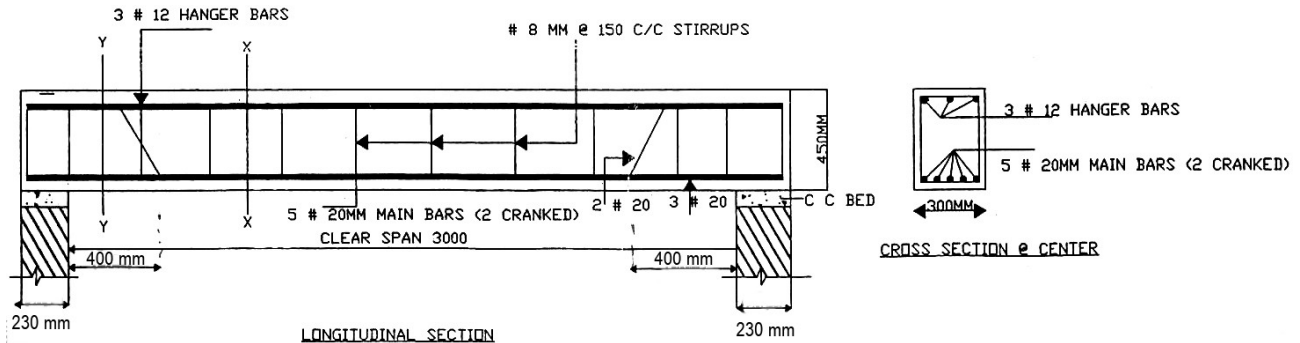(2) Each question carries **ten** marks.

(3) Part—A may be drawn not to scale.

(3) Any missing data may be assumed suitably.

1. Redraw the figure given below and name the columns and beams as per the 'column reference scheme' and 'grid referrence' scheme.

2. 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.

3 # 12 HANGER BARS
8 MM @ 150 C/C STIRRUPS
5 # 20MM MAIN BARS (2 CRANKED)
CLEAR SPAN 3000
2 # 20   3 # 20
C C BED
450MM
400 mm
230 mm
400 mm
230 mm
LONGITUDINAL SECTION

3 # 12 HANGER BARS
5 # 20MM MAIN BARS (2 CRANKED)
300MM
CROSS SECTION @ CENTER

PART—B   20×2=40

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

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

(3) All parts must be drawn to scale.

(4) Any missing data may be assumed suitably.

3. An RCC lintel with sunshade has the following specifications :
Clear Span of lintel : 2000 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 at the joint and 50 mm at free end

(a) **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 @ 150 mm c/c

(b) **Reinforcement of sunshade :**

Main bars	:	10 mm dia. bars @ 120 mm c/c
Distribution Steel	:	6 mm dia. @ 120 mm c/c

Draw to a scale of 1 : 10

  (i) Longitudinal section of the lintel   10

  (ii) Cross-section of lintel with sunshade   10

4. 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 × 5·0 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 : # 12 @ 200 mm c/c (alternate bars are cranked at a distance of 400 mm from the face of the support).

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

Provide 3 numbers of 8 mm dia hanger bars at each edge to keep the top bars in position.

(c) **Covers :**

Top and bottom clear cover	:	20 mm each
End covers	:	50 mm each

Draw to a scale of 1 : 25

  (i) Bottom plan of the reinforcement   10

 (ii) Cross-section along the shorten span   10

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