



c09-c-607

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BOARD DIPLOMA EXAMINATION, (C-09)

APRIL/MAY—2015

DCE—SIXTH SEMESTER EXAMINATION

STRUCTURAL ENGINEERING DRAWING

Time : 3 hours]

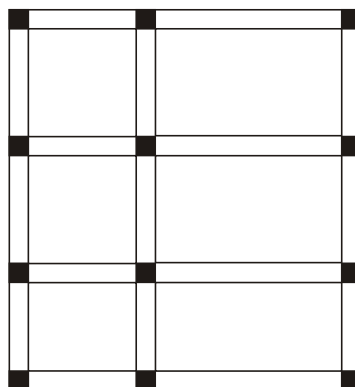
[Total Marks : 60

PART—A

4×5=20

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **four** marks.
(3) To be drawn not to scale.
(4) Assume suitable data, if necessary.

1. State any four guiding principles for positioning of beams in a structural planning of a building.
2. Redraw the figure given below and name the columns and beams as per the 'grid reference scheme' :



3. Draw the details of reinforcement at the junction of column and beam of a frame designed as earthquake resistant structure.

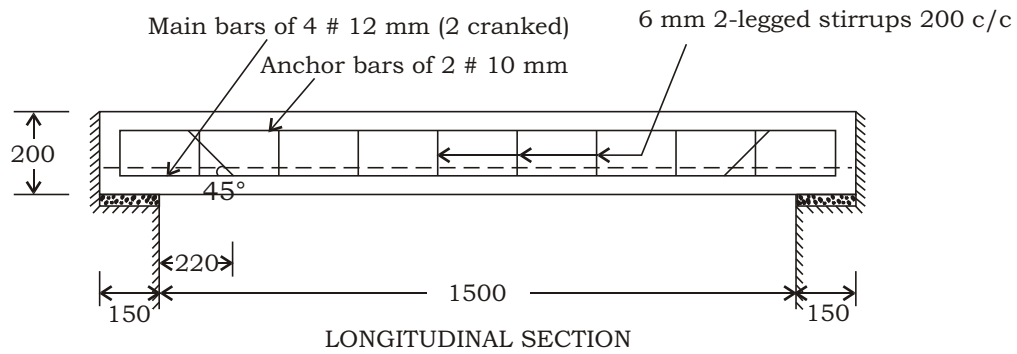
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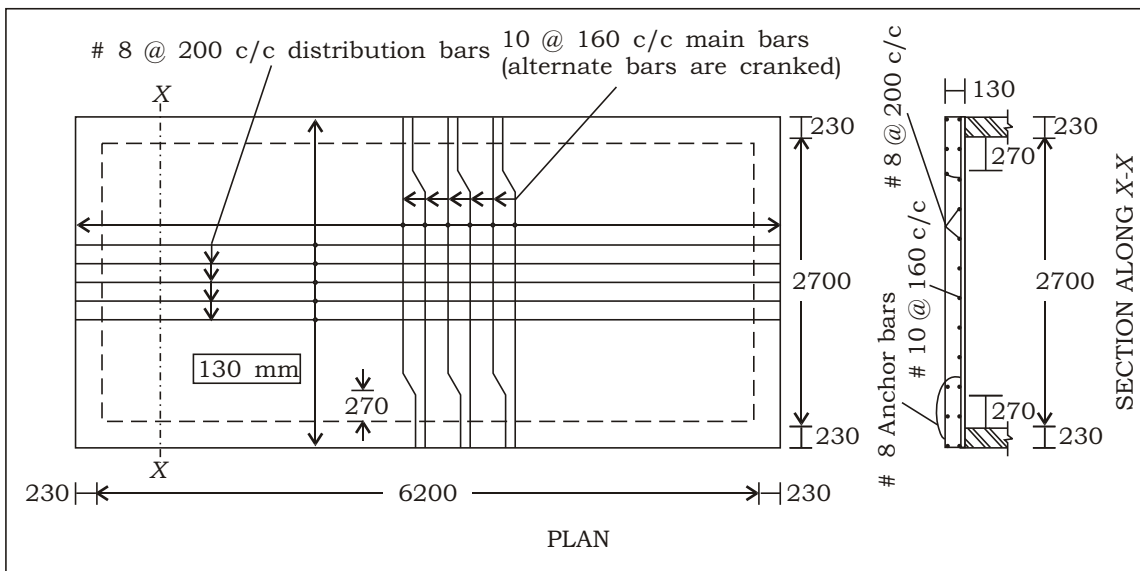
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4. Prepare the bar bending schedule and find the quantity of steel required for the main reinforcement for lintel shown in the figure below. Top and bottom covers are 25 mm and side cover is 40 mm :



5. Prepare the bar bending schedule and find the total quantity of steel required for the one-way slab shown in the figure below. Top and bottom covers are 20 mm and side cover is 25 mm :



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PART—B

20×2=40

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **twenty** marks.
(3) Assume suitable data, if necessary.

6. Draw the reinforcement details of a simply-supported singly-reinforced RCC beam with the following specifications :

(i) *Specifications :*

Clear span of the beam	4600 mm
Bearing on either side	230 mm
Width of the beam	300 mm
Overall depth of the beam	500 mm

(ii) *Materials :*

Concrete	M-20 grade
Steel	Fe-415

(iii) *Reinforcement :*

Bars in tension	4 # 20, out of which 2 middle bars are cranked at a distance of 600 mm from the face of the support at 45°
Hanger bars	2 # 12
Stirrups	# 8, two-legged stirrups at 250 mm c/c throughout

(iv) *Covers :*

Top and bottom clear cover	25 mm
Side clear cover	40 mm

Draw the following views to a scale of 1 : 20 : 10+5+5=20

- (a) Longitudinal section of beam
(b) Cross-section at the midspan
(c) Cross-section near the support

7. Draw the reinforcement details of a simply-supported RCC one-way slab with the following specifications :

(i) Specifications :

Size of the room	2.8 m 6.0 m
Edge conditions	Simply supported
Overall depth of the slab	140 mm
Bearing on walls	230 mm

(ii) Materials :

Concrete	M-20 grade
Steel	Fe-415

(iii) Reinforcement :

Main reinforcement	# 12 at 180 mm c/c (alternate bars are cranked at a distance of 400 mm from the face of the support)
Distribution reinforcement	# 10 at 220 mm c/c

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

(iv) Covers :

Top and bottom clear cover	20 mm
Side clear cover	25 mm

Draw the following views to a scale of 1 : 20 : 10+5+5=20

- (a) Bottom plan of the reinforcement
- (b) Top plan of the reinforcement
- (c) Cross-section along the longer span at midspan
