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BOARD DIPLOMA EXAMINATION, (C-16)  
AUGUST/SEPTEMBER—2021  
DCE - FOURTH SEMESTER EXAMINATION  
CIVIL ENGINEERING DRAWING – II

Time : 3 hours ]

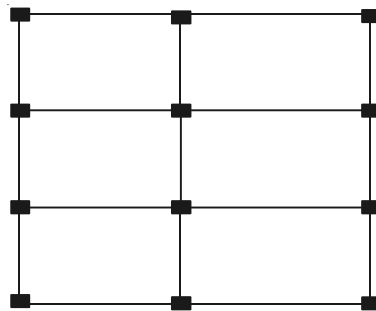
[ Total Marks : 60

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. Redraw the figure given below and mark the columns and beams as per Grid Reference Scheme.



2. State any two guiding principles each for positioning of columns and beams in structural planning of buildings.

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3. Draw the cross section of an isolated square column footing with the following specifications :

Column : 230 × 230 mm with 4 nos. of 16 mm dia steel and lateral ties of 8 mm @ 150 mm c/c.

Footing : 1200 × 1200 mm with 12 mm bars at 150 mm c/c both ways

Thickness of footing : 350 mm

Thickness of base course : 150 mm. Assume covers as 50 mm.

4. Prepare the bar bending schedule and estimate the quantity for the given reinforcement of the simply supported RCC beam with the following data :

Clear span of beam : 5000 mm, Width of beam : 230 mm, Overall depth of beam : 450 mm, Width of support : 230 mm (full bearing)

Main reinforcement : 20 mm bars 4 nos. ( 2 bars cranked at 700 mm from the face of support)

Hanger bars: 12 mm 2 nos.

Covers : Top and bottom : 25 mm    End cover : 40 mm.

5. Prepare bar bending schedule and calculate the steel quantity for the one way slab with the following data :

Size of room                    : 7000 mm × 3000 mm

Wall thickness                : 300 mm

Slab thickness                : 130 mm

Main reinforcement        : 10 mm @125 mm c/c. All the bars are cranked on one side and cranks placed alternatively at a distance of 300 mm from the face of support.

Distribution Steel         : 8 mm @150 mm c/c

All covers are of 20 mm.

\* PART—B

- Instructions : (1) Answer all questions.  
(2) Any missing data may be assumed suitably.

6. A room of clear dimensions 2.5 m × 5.5 m is covered with an RCC slab of thickness 140 mm with bearings on either side 150 mm each. The thickness of the wall is 230 mm.

The main reinforcement consists of 10 mm dia bars at 150 mm c/c and distribution bars of 10 mm dia at 250 mm c/c. Each main bar is cranked at one side only and these bars are arranged in such a way that cranks come alternatively on both sides. The cranking distance may be taken as 0.15 times the clear span from each face of the wall. All covers may be taken as 20 mm.

Draw the following to a suitable scale : 15+5=20

- (a) Bottom plan reinforcement  
(b) Section along long span.

7. Draw the following views to a scale of 1 : 25 for the longitudinally spanned dog legged stair case whose specifications are given below.

15+5=20

- (a) Longitudinal Section  
(b) Plan of the stair case

Specifications :

- (i) Size of the Stair case room : 2500 × 4000 mm  
(ii) Height of the floor : 3600 mm  
(iii) Tread : 270 mm  
(iv) Rise : 150 mm  
(v) Thickness of waist slab : 200 mm

- (vi) Bearing <sup>\*</sup>on the wall : 200 mm  
(vii) Thickness of wall : 300 mm  
(viii) Projection in to the basement : 300 × 300 mm  
(ix) Width of stair case : 1200 mm

Reinforcement :

Main bars: 12 mm dia bars at 150 mm c/c (alternate bars cranked at L/7 from bottom end)

Distribution bars : 10 mm at 200 mm c/c

Additional bars of 12 mm at 140 mm c/c at the junction of landing and waist slab. Project these bars to a distance of 1000 mm from the junction point down wards parallel to the waist slab.

All covers may be assumed as 20 mm.

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