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C14–C–607

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2017

DCE—SIXTH SEMESTER EXAMINATION

STRUCTURAL ENGINEERING DRAWING

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

PART—A 4×5=20

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

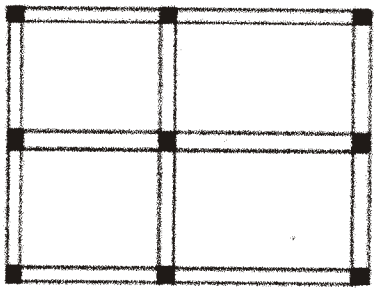
(2) Each question carries **four** marks.

(3) Part—A may be drawn not to scale.

(4) Assume suitable data, if necessary.

(5) Steel tables are permitted.

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



2. Draw the longitudinal section of a singly reinforced beam for the reinforcement details given below :

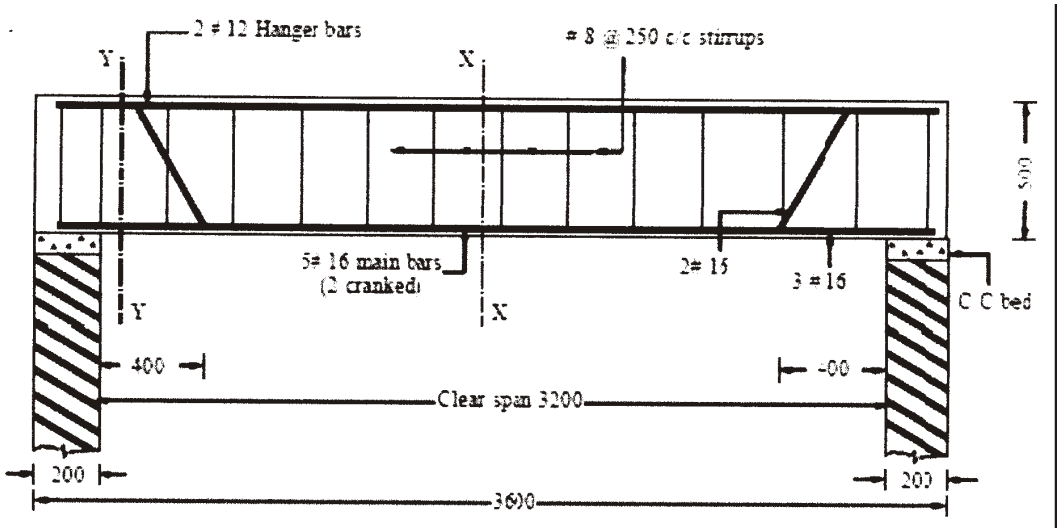
Clear span	=	3000 mm
Size of the beam	=	230 mm 450 mm
Bearing on walls	=	200 mm
Main reinforcement	=	3 nos. of 12 mm dia. (all straight bars)
Hanger bars	=	2 nos. of 12 mm dia.
Stirrups	=	8 mm dia. 2-legged bars at 200 mm c/c

3. Prepare a bar bending schedule for the one-way slab, with the following data :

Size of room	:	2500 mm 6000 mm (inside)
Wall thickness	:	230 mm
Slab thickness	:	120 mm
Main reinforcement	:	10 mm dia. bars at 150 mm c/c

All the bars are cranked on one side and cranks placed alternately.
Distribution reinforcement : 8 mm dia. bars at 200 mm c/c.
All covers are 25 mm.

4. Obtain the reinforcing details (diameter, length and no. of bars) of the simply supported beam shown in the figure below. All covers are 25 mm. Also estimate the quantity of steel required for the main reinforcement of the beam.



5. Draw the typical heal joint of a roof truss showing all details.

PART—B

20×2=40

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

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

(3) Assume suitable data, if necessary.

(4) Assume suitable scale.

6. An RCC lintel with sunshade has the following specifications :

Clear span of lintel	:	1500 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	:	500 mm
Thickness of sunshade	:	100mm at the fixed end and 50 mm at the free end

Reinforcement of lintel

Main reinforcement	:	3 nos. of 12 mm dia.
Hanger bars	:	2 nos. of 10 mm dia.
Stirrups	:	8 mm dia. 2-legged at 150 mm c/c

Reinforcement of sunshade

Main bars	:	10 mm dia. bars at 180 mm c/c
Distribution steel	:	8 mm dia. @ 200 mm c/c

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

(a) Longitudinal section of lintel

(b) Cross-section of lintel with sunshade

7. From the given specifications of a column base with gusset plate, draw the following views to a scale = 1:10 : 7+7+6

(a) Plan taking the section above the top level of the gusset plate.

(b) Elevation showing gusset plate and flange of column, etc.

(c) Elevation showing column web, gusset plate, gusset angle, etc.

Specifications :

(a) The column section consists of ISWB 500 @ 95·2 kg/m and flange plates each 325 mm 12 mm one on each side of column.

(b) Size of the baseplate 800 mm 700 mm 20 mm. Column is proportioned such that web of the column is parallel to 800 mm side.

(c) Thickness of the gusset plate is 12 mm and total depth is 400 mm and length is 600 mm and placed parallel to the flange. The edges are splayed out at a slope such that the height at the edge is 150 mm.

(d) Welded connections :

Between the web of the column, inner side of flange to the base-plate, 6 mm fillet welds are provided. Between the gusset plate to the flange of the column, 6 mm fillet weld is provided over the full height of the gusset plate. Between the gusset plate and the column base, 6 mm fillet weld are provided over the full-length on both the sides. Six anchor bolts are provided to anchor the baseplate to the concrete pedestal.

For ISWB 500 @ 95·2 kg/m, h = 500 mm; b_f 250 mm; t_f 14 7mm; t_w 9 9 mm

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