

4721**BOARD DIPLOMA EXAMINATION, (C-14)****JUNE-2019****DCE - SIXTH SEMESTER EXAMINATION****STRUCTURAL ENGINEERING DRAWING**

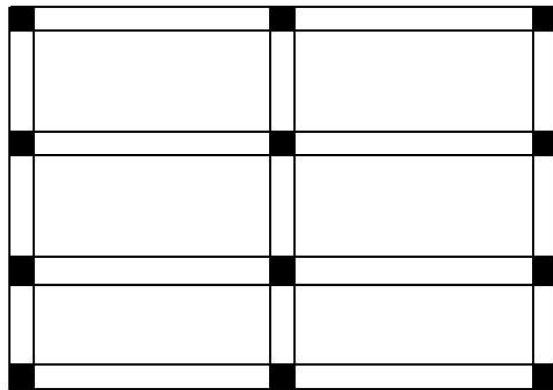
Time: 3 hours

Max.Marks:60

PART-A**4x5=20M**

- Instructions:** 1) Answer all questions. Each question carries four marks.
 2) Part-A may be drawn not to scale
 3) Any missing data may be assumed suitably.
 4) Steel tables are permitted.

- 1) Redraw the diagram given below and name the columns and beams as per the "column reference scheme".



- 2) Draw the Longitudinal section of the RC beam simply supported with size 300 mm x 500 mm, clear span of 4m, wall thickness 230mm and show the following reinforcement details assuming all covers as 40mm. Main bars 4nos.20mm dia HYSD out of which two central bars cranked at a distance of 600mm from the inner face of the support. Hanger bars 12 mm dia., 2 nos., Stirrups 8mm dia. 2-legged at 150mmc/c.

- 3) Draw the details of reinforcement at the junction of column and beam of a frame designed as Earthquake resistance structure.
- 4) Prepare bar bending schedule for the simply supported RC beam with the following data:
- | | |
|---------------------------|---|
| Clear span of the beam | = 3600mm |
| Width of the beam | = 250mm |
| Overall depth of the beam | = 400mm |
| Bearing on either side | = 250mm |
| Main reinforcement | = 4 nos. #20mm out of which two central bars are cranked through 45° at a distance of 540mm from each face of the support. |
| Anchor bars | = 2nos #10mm at top. |
| Stirrups | = 8 mm dia. 2-legged at 150mm c/c. throughout the length of the beam. |
- 5) Draw the sectional plan of a built up column with lacing system from given specifications.

Specifications:

Overall height of the column is 600mm consists of 2nos. ISMC 300@35.8kg/m placed back to back keeping a clear distance of 170mm between the webs. The column is provided with single lacing system. The sizes of lacing flats are 50mm x 10mm thick. Lacing is at an angle of 45° with the axis of the column.

Spacing between the consecutive lacing connections is 600mm. 6mm fillet weld of 120mm length is provided at lacing connection with the main component. At the end of column, 300 x 150 x 10 mm plates are provided and are connected with 6 mm fillet weld all round.

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PART-B

2x20=40M

- Instructions:** 1) Answer all questions. Each question carries twenty marks.
2) The drawing must be to the scale.
3) Any missing data may be assumed suitably.

- 6) Draw the plan and longitudinal cross section of an isolated square footing for a column with the following specifications.

Size of the column	=	300x300mm
Size of the footing	=	1800xx1800mm
Thickness of the footing	=	400mm
Base course thickness	=	150mm with P.C.C. 1:2:4
Reinforcement for footing	=	12mm dia. at 180mm c/c. in both directions.

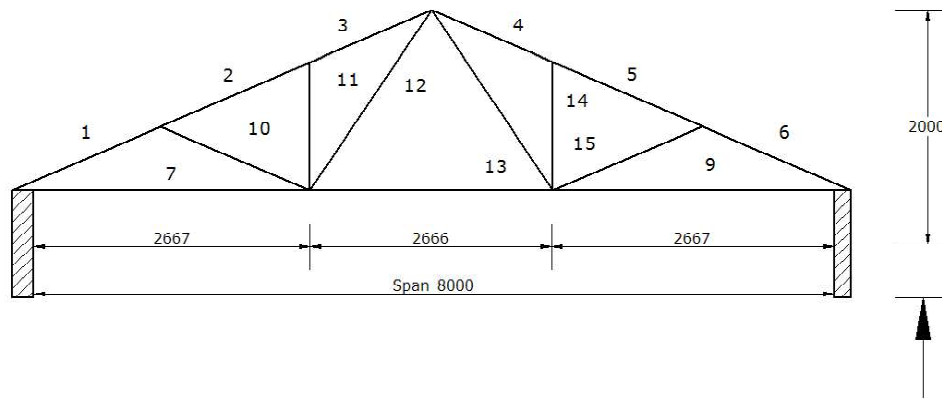
The horizontal lap length of the column reinforcing bar is 400mm each.
Reinforcement for the column:

Main bar	=	16mm dia.4nos.
Lateral ties	=	8 mmdia. ties at 200 mm c/c.
All covers	=	50mm

- 7) From the line diagram given below and with the given specifications, draw the Elevation showing the design details of roof truss.

Span of the truss	=	8000mm
Rise	=	1/4 of span
Spacing of the trusses	=	4000mm
Tie beam	=	ISA 50x50x6mm @ 4.5kg/m, 2nos. back to back
Principal rafter	=	ISA50x50x6mm@4.5kg/m, 2nos.back to back
Other members of the truss	=	ISA 50x50x6mm @4.5kg/m(single angle)
Purlins at panel points	=	ISA 125x95x10mm @16.5kg/m (single angle)
Cleat angle	=	ISA100x75x10mm@13.5kgm (single angle)
Thickness of the gusset plate	=	10mm
Supporting wall thickness	=	300mm

Size of the bearing plate = 200x200x12mm
 Size of the shoe angle = ISA 100x100x6mm @9.2kg/m.
 Anchor bolt = 20mm dia
 Roof covering = A.C. Corrugated sheets
 Welded connections used 4mm fillet welds between gusset plate and angles.



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