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15CV72

Seventh Semester B.E. Degree Examination, June/July 2019
Design of RCC and Steel Structures

Time: 3 hrs. Max. Marks: 80

Note: 1. Answer any TWO full questions, choosing one full question from each module.
2. Use of IS456, IS800, IS3370, SP(6)-steel tables is permitted.
3. Any missing data may be assumed suitably.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module - 1

1 a. Name the different types of retaining walls. **(04 Marks)**

b. Design a combined footing for two interior columns carrying axial loads 1000kN and 1200kN. Column A is 400mm × 400mm in size and column B is 450mm in diameter. They are reinforced with 20mm bars and are spaced 4m centre to centre as for a bearing capacity of the soil is 120 kN/m^2. Use M20 mix and Fe 415 grade steel. Sketch it. **(36 Marks)**

OR

2 a. Name the different classification of liquid retaining structures. **(04 Marks)**

b. Roof of a 8m wide hall is supported on a portal frame spaced at 4m intervals. The height of the portal frame is 4m. The continuous slab is 120mm thick. Live load of roof is 1.5 kN/m^2, SBC of soil is 150 kN/m^2. The columns are connected with a plinth beam and the base of the column may be assumed fixed. Design the slab, column, beam members for the columns of the portal frame. Use M20 and Fe415 grade steel. Sketch the details. **(36 Marks)**

Module – 2

3 a. Name any 4 various types of roof trusses. **(04 Marks)**

b. Design a welded plate girder for an effective span of 20m to support a Udl of 80 kN/m in addition to a pair of point loads of 870 kN each of 5m from end of beam (10m apart @ center). Design the plate girder. **(36 Marks)**

OR

4 a. What are the advantages of plate girder over trusses? **(04 Marks)**

b. Design a simply supported crane girder for the following data. The girder is electrically operated. Take yield stress of steel as 250MPa.

i) Span of the crane girder = 20m
ii) Span of the gantry girder = 7m
iii) Capacity of the crane = 250kN
iv) Self weight of crane excluding crab = 200kN
v) Weight of crab = 60kN
vi) Wheel base distance = 3.4m
vii) Minimum hook approach = 1.1m
viii) Self weight of rail = 0.3 kN/m
ix) Height of rail = 75mm. **(36 Marks)**

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