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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023
Design of RCC and Steel Structures

Time: 3 hrs.   Max. Marks: 100

Note: 1. Answer any One full question from each module.
2. Use of IS456:2000, IS800:2007, SP-16 and steel tables may by permitted.

Module-1

1   Design a rectangular combined footing for two RCC columns separated by a distance of 4m center to center. First column is 500×500mm and carries a factored load of 1250kN, second column is 600×600mm and carries factored load of 1600kN. Take SBC of soil as 200kN/m^2. Use M20 grade concrete and Fe415 grade steel. Sketch the details.   **(50 Marks)**

OR

2   Design a cantilever retaining wall to retain an embankment for a height of 4m above the ground level. Density of back fill is 16kN/m^3, SBC of soil below the base slab is 150kN/m^2, angle of repose ifs 30°, coefficient of friction is 0.55. Use M20 grade concrete and Fe415 steel. Sketch the details.   **(50 Marks)**

Module-2

3   Design a simply supported welded plate girder for a span of 20m. If carries a UDL of 40kN/m. Design the girder with intermediate stiffness and end bearing stiffeners.   **(50 Marks)**

OR

4   Design a gantry girder for an industrial shed to support an electrically operated crane using following data:
a.   Crane capacity = 250kN
b.   Weight of crab = 80kN
c.   Weight of crane girder = 300kN
d.   Minimum approach of crane hook = 1m
e.   Span of crane girder = 18m
f.   Span of gantry girder = 6m
g.   Wheel base of crane = 3m
h.   Weight of rails = 0.25kN/m
i. f_y = 250N/mm^2.

(50 Marks)

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