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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 20CV5PCDRC **Max Marks: 100**
Course: Design of RCC structural elements and CAD lab

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Use of IS 456-2000 is permitted.
3. Use of charts 43, 44, 45, 46, 63, 64 and 65 of SP-16 is permitted
4. Missing data, if any, may be suitably assumed.

UNIT – I

1	a)	Derive stress block parameters for singly reinforced beam section subjected to flexural bending	**10**
	b)	A rectangular Reinforced Concrete beam of dimension 350 × 600 mm. overall is simply supported over a clear span of 8 m. the beam consists of 3 number of 20 mm diameter tension bars, use M20 and Fe 415 grade of concrete and steel to determine the moment of resistance and UDL (live load) that the beam can carry.	**10**

OR

2	a)	A cantilever beam of size 250 × 550 mm consists of 3 number of 25 mm diameter in tension zone, use M25 and Fe 415 grade of concrete and steel to determine the moment of resistance and point load at free end. the clear span of the beam is 3 m.	**10**
	b)	A T beam consists of 120 mm thick slab supported by beam at 3 m c/c the effective width and depth of web is 300 × 580 mm. Main reinforcement consists of 8 mm bars of 20 mm diameter. the grade of concrete and steel used are M 20 and Fe 415 respectively, determine the moment of resistance of T beam if it is used as simply supported beam of span 3.6m.	**10**

UNIT – II

3		Design a cantilever beam of clear span 2.5 m to support a working live load 20 kN/m. adopt M 20 grade of concrete and Fe 415 steel. Consider the exposure condition as moderate.	**20**

UNIT - III

4		Design a simply supported slab measures 3m × 7m. it is subjected to floor finish of 1.0 kN/m^2, ceiling plaster of 0.3 kN/m^2, and partition wall load of 1.0 kN/m^2, the live load on the floor is 3.0 kN/m^2, design the slab using Fe 415 steel, sketch the reinforcement details, the slab is located in moderate exposure condition. Use appropriate concrete grade and cover to reinforcement.	**20**

OR

5	A simply supported beam has a rectangular section and carries a UDL of 20 kN/m over a clear span of 4.5 m. the c/s is 300 × 550 mm and is reinforced with 4 numbers of 20 mm diameter bar. Assuming, M20 concrete and Fe - 415 steel. compute short and long term deflections of the beam. assume suitable cover for the beam.	**20**

UNIT – IV

6	A corner column of a multistorey framed structure of 400 × 400 mm is subjected to a factored load of 1300 kN with Mux = 190 kN.m, Muy = 110 kN.m, design the reinforcement of the column by assuming M25 concrete and Fe-415 steel. Take the unsupported length of column as 3.5 m, also assume the effective cover of 60 mm.	**20**

UNIT – V

7	A rectangular column 450 mm × 600 mm transfers a total load of 2000 kN without any moment and there is no overburden. The Safe bearing capacity of soil is 140 kN/m^2. M20 grade of concrete and HYSD steel bars of Fe 415 shall be used. Design a rectangular footing to support the column.	**20**

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