University of Mumbai

Program: **CIVIL ENGINEERING**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: CE-C702 and Course Name: Theory of Reinforced Concrete Structures

Time: 2-hour 30 minutes   Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	In WSM, the indirect relation between Steel and Concrete is expressed in terms of _____
Option A:	Strain Compatibility
Option B:	Modular ratio
Option C:	Residual Strain
Option D:	Stress compatibility
2.	Calculate the allowable stress for steel bar with yield strength of 500N/mm^2. Adopt WSM Method.
Option A:	300.50 N/mm^2
Option B:	280.90 N/mm^2
Option C:	166.67 N/mm^2
Option D:	250.00 N/mm^2
3.	Calculate Permissible Shear Stress in Concrete if grade of Concrete is M25 and Percentage Steel in the beam is 0.65%. Adopt WSM
Option A:	0.43 MPa
Option B:	0.61 MPa
Option C:	0.23 MPa
Option D:	0.33 MPa
4.	Partial Safety Factor for Concrete and Steel as per WSM is _____ and _____ respectively
Option A:	1.15 and 1.5
Option B:	3 and 1.78
Option C:	1.5 and 1.15
Option D:	1 and 1

5.	Calculate the Modular Ratio for Concrete of grade M25.
Option A:	13.33
Option B:	12
Option C:	10.98
Option D:	14
6.	Which IS code is used for general construction of RCC?
Option A:	IS 456
Option B:	IS 256
Option C:	IS 800
Option D:	IS 100
7.	Minimum grade of concrete for RCC work
Option A:	M10
Option B:	M15
Option C:	M20
Option D:	M25
8.	Design Strength of Concrete as Material is taken as _____ in Limit State of Collapse.
Option A:	0.45fck
Option B:	0.67fck
Option C:	0.55fck
Option D:	0.23fck
9.	Deflection of doubly reinforced beam are _____ compared to singly reinforced beams of same depth
Option A:	More
Option B:	Equal
Option C:	Less
Option D:	Zero
10.	The Design strength of Steel is taken _____
Option A:	0.87fy
Option B:	0.446fck
Option C:	0.67fck
Option D:	0.5fy

Q2	Solve any two out of three.	10 marks each
A	A rectangular beam having 200mm width and 400 mm effective depth is reinforced with 3 bars of 16 mm diameter. Find the ultimate UDL which the beam can carry over a span of 5m. use M20 and Fe415. use LSM	
B	Find out ultimate MR of doubly reinforced rectangular section of size 250*550 mm effective having tensile reinforcement 3054 mm^2 and compressive reinforcement 982mm^2 use M20 and Fe415. use LSM	
C	Design a short axially circular column carrying factored load of 1500 KN. Use M20 and Fe415	

Q3	Solve any two out of three.	10 marks each
A	A-T beam floor system has 130mm thick slab supported on beams. Width of rib is 295mm, effective depth = 590 mm and tension steel has 6 bars of 20mm diameter. Use M20 and Fe415 steel, Find Moment of resistance. Use LSM	
B	A beam has rectangular section with a width of 360mm and overall depth of 750mm. it is subjected to factored bending moment of 220KNm , Factored torsion of 100 KN.m and Factored Shear force of 145 KN. Take effective cover of 50mm on all four sides . adopt M20 and Fe415 steel, design reinforcement for the section Use LSM	
C	Design a singly reinforced rectangular beam for an applied factored moment of 125 KN.m . Assume width as 235mm . use M20 and Fe415 steel. Use LSM	

Q4	Solve any one out of two	20 marks each
A	Design a RCC Slab of Dimension 5 m* 4m simply supported from all the four edges on beams width of 300mm take live load =3KN/m^2 and floor finish load 1 KN/m^2 use M20 and Fe415 grade of concrete to steel respectively.	
B	Design footing for two column i.e column A and column B spaced at 4m apart the SBC of the soil 200 KN/m^2 .M20 and Fe415 grade of concrete to steel respectively. Use LSM Column A 450mm*450mm Pa =800 KN Column B 600mm*600mm Pb =1200 KN	