Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION - JAN 2023

Course Code: CIV211
Course Name: Design of RC Structural Elements
Program : B. Tech - CIVIL

Date: 23-Jan-2023
Time: 9.30 AM to 12.30 PM
Max Marks: 100
Weightage: 50%

Instructions:

Read the all questions carefully and answer accordingly.
Use of IS456 and SP 16 charts are allowed

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries FIVE marks. (4Qx 5M= 20M)

1. Write short note on limit state method of collapse and limit state of serviceability in limit state design. (C.O.No.1) [Knowledge]

2. Briefly explain the concept of balanced, over-reinforced and under-reinforced beam sections. (C.O.No.2) [Knowledge]

3. List the differences between one-way and two-way slabs. (C.O.No.3) [knowledge]

4. Classify the different types of column based on type of loading. (C.O.No.4) [knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries TWENTY marks. (2Qx20M=40M)

5. Design a simply supported slab for a room of size 3m x 7m and it is supported on 230mm thick masonry walls. Slab is subjected to a live load of 2kN/m^2 and floor finish of 1.5 kN/m^2. Use M20 grade of concrete and Fe 415 steel. Ignore check for deflection. (C.O.No.3) [Application]
6. Design the reinforcement for a square column which is subjected to a factored axial load of 3000kN. The effective length of column is 3.0m. Use M20 concrete and Fe415 steel. (C.O.No.4) [Application]

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries TWENTY marks. (2Qx20M=40M)

7. Design a simply supported two-way slab, for a room having clear dimensions, 4m by 5m with 230mm walls all around. Adopt M20 grade concrete and Fe415 HYSD bars. Take floor finish = 0.6 kN/m^2 and live load = 4kN/m^2. Assume the corners are prevented from lifting.
. (C.O.No.3) [Application]

8. Design the reinforcement for a circular column, subjected to an axial factored load of 2500kN. The effective length is 4 m. Use M20 concrete and Fe415 steel.
(C.O.No.4) [Application]

TABLE A SALIENT POINTS ON THE DESIGN STRESS-STRAIN CURVE FOR COLD-WORKED BARS

(Clause 1.4)

Stress Level	f_y = 415 N/mm^2		f_y = 500 N/mm^2	
	Strain	Stress	Strain	Stress
(1)	(2)	(3) N/mm^2	(4)	(5) N/mm^2
0·80 f_{yd}	0·001 44	288·7	0·001 74	347·8
0·85 f_{yd}	0·001 63	306·7	0·001 95	369·6
0·90 f_{yd}	0·001 92	324·8	0·002 26	391·3
0·95 f_{yd}	0·002 41	342·8	0·002 77	413·0
0·975 f_{yd}	0·002 76	351·8	0·003 12	423·9
1·0 f_{yd}	0·003 80	360·9	0·004 17	434·8

Note -- Linear interpolation may be done for intermediate values.

TABLE F STRESS IN COMPRESSION REINFORCEMENT f_{sc}, N/mm^2 IN DOUBLY REINFORCED BEAMS WITH COLD-WORKED BARS

(Clause 2.3 2)

f_y, N/mm^2	d'/d			
	0·05	0·10	0·15	0·20
415	355	353	342	329
500	424	412	395	370