

Roll No _____

**RE-APPEAR, EXAMINATION
DEC, 2024**

Course Code :- APCE 315A Course Name:-Structural Design V

Programme Name: B.Arch



Time:2.5Hours

Maximum Marks: 50

Instructions: All questions are compulsory. The question paper consists of 11 questions divided into three part A, B and C. Section-A comprises 5 questions of 2 marks each, Section-B comprise 4 questions of 5 marks each and Section-C comprises 2 questions of 10 marks each. Q. No. 7, Q. No. 10 and Q. No. 11 have internal choices.

Section-A (5 X 2 = 10 Marks)

1	Explain in brief the procedure for pre-stressed concrete.	CO2
2	Define Design values for concrete.	CO1
3	Enumerate various loadings acting on a structure.	CO3
4	How are shells placed on a dome and what is its application?	CO4
5	What is the mixing proportion of M15 and M20 Grade of concrete?	CO1

Section B (4 X 5 = 20 Marks)

6	Explain in brief Working Stress Method for design of concrete structures	CO3
7	Explain various types of staircase with the help of diagrams. OR	CO2
	What are the various applications of domes? Explain in detail.	CO4
8	Describe the procedure for calculating area of steel, number of bars and spacing between the bars?	CO2
9	What are the characteristics of singly reinforced and doubly reinforced beam?	CO4

Section C (2 X 10 = 20 Marks)

10	What are the various losses observed in pre-stressed concrete? Explain in detail. OR A rectangular pre-stressed concrete beam of size 300 mm × 600 mm and effective span 14 m is post tensioned by a cable with an initial stress of 1400 N/mm ² from one end. The parabolic cable is concentric at supports and has an eccentricity of 140 mm at mid-span. Coefficient of friction due to curvature effect is 0.5 and coefficient of friction for wobble effect is	CO1
----	---	-----

	0.0015 per m. The loss of pre-stress in cable due to friction is?	
11	A straight stair in a residential building is supported on wall on one side and stringr beam on the other side. The risers are 150mm and treads are 250mm, and the horizontal span of the stairs may be taken as 1.2 metres. Design the steps. Use M15 concrete and HYSD bars. OR Find the M.R. of a singly reinforced concrete beam section of 200 mm width And 400 mm effective depth, reinforced with 4 bars of 20 mm dia(mild steel) Use M15 concrete. Use I.S. code method.	CO3 CO2