



End Semester Examination – Nov/Dec – 2016

Code :	14CE3008	Semester :	2016-17 ODD
Sub. Name :	Advanced Design of Reinforced Concrete Structures	Duration :	3hrs
		Max. marks :	100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	A simply supported spanning over 7m is of rectangular section with a width of 300mm and overall depth of 550mm. The beam is reinforced with 4 bars of 25mm ϕ on the tension side at an effective depth of 500mm. Two nominal hanger bars of 12mm ϕ are provided on the compression side. The beam is subjected to a service load moment of 150kN.m at the centre of span section. Assume M_{20} concrete and Fe ₄₁₅ steel. Check the beam for the serviceability limit state of cracking.	CO1	15
(OR)				
2.	a.	A reinforced concrete beam has a support section with a width of 300mm and effective depth of 500mm. It is reinforced with 5# of 20mm ϕ out of which 2 bars are bent up near the support section where a factored shear force of 450kN is acting. Use M20 concrete and Fe415 steel. Design for shear.	CO1	5
	b.	Discuss the bond mechanism in reinforced concrete structures	CO1	5
3.	a.	Design the typical interior panel of a flat slab floor of size 5m x 56m with suitable drop to support a live load of 4kN/m ² . The floor is supported by columns of size 450mm x 450mm. Use M20 concrete and Fe415 steel.	CO1	15
(OR)				
4.	a.	Design the simply supported circular slab of diameter 5m which is subjected to a super imposed load of 4kN/m ² . Use M20 concrete and Fe415 steel.	CO1	9
	b.	Discuss the advantages of composite column.	CO1	6
5.	a.	Design a spherical dome for a hall of 6m diameter. The rise of the dome is 1.4m. The live load may be taken as 1k/m ² . Use M20 concrete and Fe250 steel.	CO1	11
	b.	Discuss the behavior of folded plate roof.	CO1	4
(OR)				
6.	a.	A cylindrical silo has an internal diameter of 6m and 20m deep with a conical hopper bottom. The material stored is wheat with a density of 9kN/m ³ . The coefficient of friction between wall and material is 0.44. The ratio of horizontal to vertical pressure intensity is 0.4. Angle of repose is 25°. Design the silo using M20 concrete and Fe415 steel.	CO1	15
7.	a.	Discuss the design principles of cooling tower.	CO1	10
	b.	A T- beam ABC is continuous over two spans of 8m each and it carries udl factored load of 75kN/m. Check whether we can reduce the max. moment by 30% and redistribute to spans. Flange width = 1m and web width = 0.3m and slab thickness = 150mm.	CO1	15
(OR)				
8.	a.	Explain the procedure adopted in the design of chimneys and draw typical cross section showing details of reinforcement.	CO1	8
	b.	Discuss the conditions for moment redistribution.	CO1	7

		<u>Compulsory:</u>		
9.	a.	A reinforced concrete grid floor is to be designed to cover a floor area of 10m x 20m. The spacing of the ribs in mutually perpendicular directions is 2m c/c. Live load on floor is 3.5kN/m ² . Adopt M20 grade concrete and Fe415 grade HYSD bars. Assume ends are simply supported. Analyse the grid floor by IS456 method and design suitable reinforcements in the grid floor.	CO1	15

ALL THE BEST

Course Outcome:

Students at the end of the course will be able to:

CO1: Design various reinforced concrete structures