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## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Civil Engineering Semester End Examination; Dec - 2016/Jan - 2017 Advanced Concrete Technology

Time: 3 hrs Max. Marks: 100 *Note*: i) Answer *FIVE* full questions, selecting *ONE* full question from each unit. ii) IS 10262: 2009, IS 456: 2000 permitted. UNIT - I 1 a. Enumerate the importance of Brogue's compounds in ordinary Portland cement. 8 Explain the Rheology of concrete in-terms of Bingham's parameter. 6 Discuss the factors influencing the strength of the cement (any 3). 6 2 a. What is transition zone? Explain the various factors which affect on the strength of transition 10 zone. Write short notes on: b. 10 i) Volume of hydrated product ii) AAR **UNIT - II** 3 a. Discuss the effects of super plasticizers on fresh and hardened concrete. 10 What is optimum dosage of a plasticizer? Explain Marsh cone test. 10 b. What is GGBS? Explain their effect on concrete in flesh and hardened state. 4 a. 10 b. Write a short note on: 10 i) Air entraining admixtures ii) Fly ash. **UNIT - III** 5. Design a M30 concrete mix for following data as per IS 10262 design stipulation for proportioning. i) Grade designation: M30 ii) Type of cement: Ultra Tech PPC confirming to IS: 1489 iii) Maximum nominal size of aggregates: 20 mm iv) Minimum cement content: 300 kg/m<sup>3</sup> v) Maximum water cement ratio: 0.50 20 vi) Workability: 50 – 75 mm (slump) vii) Exposure condition: Moderate viii) Degree of supervision: Good

ix) Type of aggregate: Crushed angular aggregate

	Test data of materials:						
	i) Specific gravity of cement : 3.05						
	ii) Specific gravity of coarse aggregate: 2.68						
	iii) Specific gravity of fine aggregate: 2.66						
	iv) Water absorption, coarse: 0.85%, fine = 1.15%						
	v) Free moisture : Nil						
	vi) Sieve analysis: Coarse: Table 2 of IS: 383						
	Fine: Zone II of IS: 383.						
6 a.	What is ready mix concrete? Explain the types of ready mix concrete in practice.						
b.	b. Write a short note on:						
	i) Under Water Concreting ii) Self Compacting Concrete.	10					
	UNIT - IV						
7 a.	Explain the factors affecting the properties of fresh Steel Fiber Reinforced Concrete (SRFC).						
b.	b. What is the definition of HPC? What are the critical parametry involved in producing HPC?						
8 a.	What is Ferro cement? Discuss the properties and applications of Ferro cement.						
b.	b. What is structural light weight concrete? Explain the strength and workability of typical light						
	weight concrete.	10					
	UNIT - V						
9.	Write a short note on:						
	a) Thermal conductivity b) Permeability of concrete	20					
	c) Corrosion in concrete d) IS 456-2000 requirement for durability.						
10 a.	What is modulus of rupture? How it is determined in laboratory?						
b.	List the factors influencing the strength of concrete and explain any two.						
c.	Explain how the UPr of concrete is determined? Mention factors affecting UPR reading. List						
	the typical range of UPr for $q$ assessment.						

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