Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
END Semester Examination MAY 2019

Course Name: Concrete Technology **Semester: IV**
Program: B. Tech (Civil Engg)
Time: 03 hrs. **Max. Marks: 100**
Instructions: Answer all the questions **Course Code: CIVL 2003**

SECTION A

S. No.		Marks	CO
Q.1	Explain the importance of size & shape in aggregates.	**8M**	**CO1**
Q.2	State the advantage of Lightweight concrete over conventional concrete.	**8M**	**CO5**
Q.3	Define workability. Explain the various factors affecting workability of concrete.	**7M**	**CO2**
Q.4	What are various factors affecting permeability of concrete.	**7M**	**CO4**
	SECTION B		
Q .5	Discuss & compare the role of C_3S, C_2S, C_3A & gypsum in governing the properties of concrete with proper diagrams.	**15M**	**CO1**
Q.6	Explain the properties of "Fiber reinforced concrete". Also, explain the practical applications for the same in civil engineering.	**15M**	**CO5**
Q.7	Explain the effect of Bleeding & segregation on the strength of Concrete in hardened state. How does it affect creep & shrinkage in later stages?	**15M**	**CO4**
	OR		
Q.7	List various non-destructive tests for assessment of strength in hardened concrete. Explain rebound hammer test.	**15M**	**CO2**
	SECTION-C		
Q.8	Design the concrete mix of M25 Grade by IS method with following data: Specific gravity of cement, F.A & C.A are 3.12, 2.90 & 2.60. Water absorption values for F.A & C.A are 0.80% &0.50%. Free moisture is nil in both types of aggregate. Slump =100. Q.C = Good. Exposure = Moderate. Determine the list quantities of ingredients in kg/m^3 of concrete	**25M**	
	OR		
Q.8	Explain "Maturity of concrete". The strength of sample of fully matured concrete found to be 40Mpa. Find the strength of identical concrete at the age of 7 days when cured at an average temperature during daytime at 20^0C & nighttime at 10^0C. Take A = 32 & B = 54. Use % strength of concrete at maturity is = A+ B $\log_{10}$(Maturity/100)	**25M**	**CO3**

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S. No.		Marks	CO
	SECTION A		
Q.1	Name any four types of cement. State the properties & application of any two.	**8M**	**CO1**
Q.2	Explain the role of admixtures in concrete technology.	**8M**	**CO5**
Q.3	Discuss the effects of impurities in water on properties of concrete.	**7M**	**CO2**
Q.4	Explain the effect of w/c ratio on the strength of hardened concrete. Explain mechanism	**7M**	**CO4**
	SECTION B		
Q .5	Explain test for determining initial and final setting time of cement as per IS requirements IS 456-2000? Differentiate between setting & hardening of cement.	**15M**	**CO1**
Q.6	What is Ferro cement technique? What are various advantage, application & use of Ferro cement technique in civil engineering.	**15M**	**CO5**
Q.7	Enumerate the role of curing in the performance of concrete in hardened state. Name at least four methods of curing	**15M**	**CO4**
	OR		
Q.7	Mention the names of in-situ concrete testing methods. Mention the principle & limitations of ultrasonic pulse velocity test.	**15M**	**CO2**
	SECTION-C		
Q.8	1. Explain the concept of mix design pertaining to concrete 2. Arrive a mix proportion for concrete mix with following: max size of aggregate =20mm; Slump required = 100mm; QC = Good; Exposure = mild; 53 Grade OPC cement with specific gravity =3.15. Specific Gravity of C.A & F.A are 2.55 & 2.70. Water absorption = 0.5% for C.A & 1% for F.A. F.A is conforming to Zone III	**25M**	**CO3**
	OR		
Q.8	Design the M40 grade concrete for the following requirements: (i) Type of cement: OPC43 conforming to IS 8112 (ii) Maximum Nominal size of aggregate: 20mm (iii) Workability: 100mm slump (iv) Exposure condition: Severe (v) Chemical Admixture: Superplasticizer (vi) Maximum cement content: 450kg/m^3 (vii) specific gravity of coarse & fine aggregate is 2.74 & cement is 3.15	**25M**	