Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 711506N **Date: 30-12-2013**

Subject Name: Basics of Reinforced Concrete and Masonry Construction

Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q 1	**A**	Write short note on admixtures used to increase workability of concrete.	**7**
	B	What precautions are to be taken during mixing and transportation process of concrete? Discuss the adverse effects that occur due to improper mixing or placing.	**7**
Q 2	**A**	What do you understand by the term curing of concrete? What is the significance of curing and enlist various techniques of curing of concrete.	**7**
	B	What is meant by alkali-reactive aggregate? What are the main sources of alkali in concrete? What cement would you use with aggregate suspected of being alkali reactive?	**7**
		OR	
	B	What do you understand by the terms polymer concrete, latex-modified concrete and polymer impregnated concrete? What is the principal consideration in the design of polymer concrete mixtures?	**7**
Q3	**A**	Using IS-10262(2009) method of mix design, find out proportions of concrete for following data: Grade of Concrete: M 25 Degree of Control: Very good Maximum size of Aggregate: 20 mm Specific gravity of Cement: 3.15 Specific gravity of FA: 2.65 Specific gravity of CA: 2.80 Sand is confirming zone III Condition of Exposure: severe Workability: Slump 75-100 mm **(Refer table 1 to 4.)**	**14**
		OR	
Q 3	**A**	Write short note on earthquake resistant features of masonry.	**7**
	B	Enlist the various repairing materials and repairing techniques that are used for distressed structures.	**7**
Q 4	**A**	Write short note on fibre reinforced concrete.	**7**
	B	In spite of the cellular structure of aggregate, lightweight concretes show less micro cracking and excellent durability. Why?	**7**
		OR	
Q 4	**A**	Enlist the factors that cause distress in structure. Discuss the precautionary and remedial measures.	**7**

	B	Non-destructive testing in concrete has a vital part in assessing the quality of concrete . Name the tests that justify the statement.	**7**
Q 5	**A**	State the steps for brick masonry design with a suitable example.	**7**
	B	Describe sieve analysis for aggregate and determination of fineness modulus. Also prepare required tabular form.	**7**

OR

Q 5	**A**	State the types of steel to be used as construction material. Mention the standards and test required for the same.	**7**
	B	Explain in short the procedure for the damage assessment of structural element.	**7**

Table 1

EXPOSURE	RCC		PCC		Min Grade	
	MINIMUM CEMENT CONTENT	**MAX FREE W/C RATIO**	**MINIMUM CEMENT CONTENT**	**MAX FREE W/C RATIO**	**PCC**	**RCC**
MILD	300	0.55	220	0.6		M20
MODERATE	300	0.50	240	0.6	M15	M25
SEVERE	320	0.45	250	0.5	M20	M30
VERY SEVERE	340	0.45	260	0.45	M20	M35
EXTREME	360	0.40	280	0.4	M25	M40

Table 2

No.	Grade	Std. deviation
1	10	3.5
2	15	
3	20	4
4	25	
5	30	5
6	35	
7	40	
8	45	
9	50	
10	55	

TABLE 3

No	Max. size of aggregate (mm)	Maximum Water Content (kg)
1	10	208
2	20	186
3	40	165

TABLE 4

Nominal Maximum size of aggregate, mm	Volume of coarse aggregate per unit volume of total aggregate for different zones of fine aggregate (For w/c ratio of 0.5			
	Zone IV	Zone III	Zone II	Zone I
10	0.5	0.48	0.46	0.44
20	0.66	0.64	0.62	0.6
40	0.75	0.73	0.71	0.69
Volume of coarse aggregate per unit volume of total aggregate needs to be changed at the rate of -/+ 0.01 for every +-0.05 change in w/c ratio				