

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 711506N

Date: 10-01-2013

Subject Name: Basics of Reinforced Concrete and Masonry Construction

Time: 02.30 pm – 05.00 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 air entrained concrete. 7
 B Explain soundness test in detail with neat sketch and also specify its Indian standards. 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 Briefly explain the causes and control of scaling and D-cracking in concrete. What is the origin of laitance and what is its significance. 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: 14
 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
 Condition of Exposure: severe
 Workability: Slump 75-100 mm
 Refer table 1 to 4.
- OR**
- Q 3 A Write short note on earthquake resistant features of masonry. 7
 B Write short note on ready mix concrete. 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 What is meant by jacketing? Discuss different methods of jacketing. 7
- Q 5 A State the steps for brick masonry design with a suitable example. 7
 B Explain in detail the procedure to find aggregate crushing value and also mention the Indian standards for the same. 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				
