

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER- II (Old course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 1722009

Date:16/05/2015

Subject Name: Concrete Technology

Time: 02:30 pm to 5:00 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) Explain with flow diagram how Cement manufactured by wet process? 07
(b) Enumerate the different tests performed on cement to see its compliance with BIS. 07
Describe how Compressive Strength test is performed.

Q.2 (a) By using IS recommended guidelines design a concrete mix for a reinforced 07
concrete structure to be subjected to mild exposure conditions for the following
requirements (by volume as well as by mass)

- (i) Design stipulations
 - a. Degree of workability = Medium (0.9 C For 75-100 mm slump)
 - b. Characteristic strength at 28 days = 25 MPa
 - c. Maximum nominal size of the agg = 20mm
 - d. Type of aggs = Angular (crushed) granite
 - e. Degree of quality control = weigh batching, occasional supervision & tests.
From past records $S = 5.5$ MPa
 - e. Grading zone of sand = III
 - f. Type of cement = 53 grade OPC

(i) Characteristics of Materials.

Material	Specific Gravity	Bulk density	Moisture content	Water absorption
Cement	3.15	1450 Kg/m ³	-----	-----
FA	2.60	1700 Kg/m ³	2.0%	----
CA	2.65	1800 Kg/m ³	----	1.0%

(b) Define flakiness and elongation index of aggregate. Explain how the test is 07
performed.

OR

(b) What is fineness modulus? Find the fineness modulus for the given sample of 07
aggregates and Give its significance as per the result.

Sieve size.	Mass retained.(in grams)
80mm	00
40mm	00
20mm	60
10mm	800
4.75mm	140

Q.3 (a) Explain the manufacturing process of Portland Pozzolana Cement and rapid 07
hardening cement and give its uses/applications.

(b) Calculate the gel/space ratio and theoretical strength of sample of concrete with

700 gm of Cement with 0.7 W/C ratio at 50% hydration. 07

OR

- Q.3 (a) Estimate the appropriate split strength of a standard cylinder of concrete having a split load of 45 KN at failure. 07
(b) What are advantages of using NDT methods of Concrete and explain ultrasonic test method in detail. 07
- Q.4 (a) Define workability. What are methods of testing the workability of concrete. 07
(b) State the steps involved in manufacturing of concrete and explain any one in detail. 07

OR

- Q.4 (a) Discuss the effects of the following factors on strength of concrete :- 07
1. Gel/Space ratio
2. water/cement ratio
(b) Differentiate between segregation and bleeding of fresh concrete. Also discuss how it can be minimized. 07
- Q.5 (a) Define curing and state the different methods of curing . 07
(b) What is the difference between Chemical admixture and mineral admixture? Explain how by using the superplasticizer the water requirement decreases. 07

OR

- (a) Write short note on alkali aggregate reaction and sulphate attack. 07
(b) Write short note on permeability of concrete. Explain factors affecting permeability of Concrete. 07
