

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-II Remedial Examination December 2010****Subject code: 722009****Subject Name: Concrete Technology****Date: 23 /12 /2010****Time: 02.30 pm – 05.00 pm****Total Marks: 60****Instructions:**

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

- Q.1 (a)** How is Cement manufactured? How is wet process different to the dry process? **06**
- (b)** Enumerate the different tests performed on cement to see its compliance with BIS. Describe any one of it. **06**

- Q.2 (a)** By using IS recommended guidelines design a concrete mix for a reinforced concrete structure to be subjected to mild exposure conditions for the following requirements (by volume as well as by mass) **06**

(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
- f. Grading zone of sand = III
- g. Type of cement = 43 grade OPC

(ii) 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)** Give classification of aggregates on the basis of its origin, size, shape and unit weight **06**

OR

- (b)** What is fineness modulus? Find the fineness modulus for the given sample of aggregates and Give its significance as per the result. **06**

Sieve size.	Mass retained.(in grams)
80mm	00
40mm	00
20mm	80
10mm	780
4.75mm	140

- Q.3 (a)** Explain the manufacturing process of 3 different cement other than OPC and give its uses/applications. **06**
- (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 70% hydration. **06**

OR

- Q.3 (a)** Estimate the appropriate split strength of a standard cylinder of concrete having a split load of 85 KN at failure **06**
- (b)** State the various NDT methods of Concrete and explain Rebound hammer test in detail. **06**
- Q.4 (a)** Define workability. State the factors affecting the workability of concrete. **06**
- (b)** State the steps involved in manufacturing of concrete and explain compaction in detail. **06**
- OR**
- Q.4 (a)** Discuss the effects of the following factors on strength of concrete -: **06**
1. Gel/Space ratio
 2. Aggregate/cement ratio
 3. water/cement ratio
- (b)** Differentiate between segregation and bleeding of fresh concrete. Also discuss how it can be minimized **06**
- Q.5 (a)** Define curing and state the different methods of curing and explain membrane curing in detail. **06**
- (b)** What is the difference between an admixture and an additive? Explain the effect of a superplasticizer on the properties of concrete. **06**
- OR**
- Q.5 (a)** Write a short note on the flexural strength of concrete **06**
- (b)** How the durability of concrete can be increased by using pozzolonic admixtures? **06**
