

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1722009

Date: 03-01-2013

Subject Name: Concrete Technology

Time: 10.30 am – 13.00 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) What are the different compounds of cement? What is the role of different compounds of cement? In OPC, what is the different percent of different compounds present? (07)
- (b) What are the chemical and physical properties of ordinary portland cement 53 Grade. (07)

Q.2

- (a) What are the steps for designing of concrete mix as given by the recommended guidelines by IS10262 (07)
- (b)) How will you classify aggregates on the basis of origin. Explain giving example . Explain bulking of sand. (07)

OR

- (b) State the tests on hardened concrete those you have performed in the laboratory and explain split test in detail. (07)

Q.3 (a) Write applications of any two types of cement as given below: (07)

- (i) Rapid Hardening Cement.
- (ii) Pozzolanic Cement.
- (iii) Sulphate resisting Cement

- (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 60% hydration. (07)

OR

Q.3 (a) Estimate the appropriate split strength of a standard cylinder of concrete having a split load of 90 KN at failure. (07)

- (b) What is Non destructive testing. What are its advantages and enlist different methods of NDT methods of Concrete and explain Rebound hammer test in detail. (07)

Q.4 (a) Define workability. Enlist the different methods of performing workability tests in laboratory. (07)

- (b) State the steps involved in manufacturing of concrete and explain any one in detail. (07)

OR

- Q.4 (a) Discuss the various curing methods performed on concrete. (07)
(b) How can we achieve Light weight Concrete and what are its advantages? (07)

- Q.5 (a) Define maturity of concrete. (07)
Lab experiment conducted at Thane on a particular mix showed a strength of 320 Kg/cm^2 for fully matured concrete. Find whether form work can be removed for an identical concrete placed at Kashmir at the age of 15 days, when the average temperature is 5°C if the concrete is likely to be subjected to a stripping stress of 250 Kg/cm^2 . (Take constants A & B are 21 & 61 respectively)
(b) What are mineral admixtures? Name any four mineral admixtures used to replace cement. (07)

OR

- Q.5 (a) What are the factors affecting strength of concrete. Discuss the various theories affecting the strength of concrete. (07)
(b) Design strength of concrete mix is always higher than the strength prescribed by a structural engineer. Why?. (07)
