

06CE7121

Reg. No _____

Name _____

A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY

M.TECH DEGREE EXAMINATION, DECEMBER 2016

THIRD SEMESTER

Computer Aided Structural Engineering

Civil Engineering

Concrete Material Science

Time: 3 Hours

Max. Marks: 60

PART A

Answer ALL questions

1. Distinguish between chemical and mineral admixtures. What are the advantages of using mineral admixtures in cement?
2. What is mix design? What are the specifications required for concrete mix design?
3. What are the various factors affecting compressive strength of concrete?
4. What are advantages and disadvantages of using Ready Mix Concrete?

(4 x 5 marks =20 marks)

PART B

5. (a) Explain the process of manufacture of cement by wet process. (7 marks)
(b) What are the advantages of dry process over wet process? (3 marks)

OR

6. Write a brief note on the rheological properties of concrete and factors affecting them. (10 marks)

7. (a) What are the steps involved in concrete mix design by ACI method? (8 m)
(b) Write short note on new approaches in mix design. (2 marks)

OR

8. Design a concrete mix as per IS code method using the following data;

Design Stipulations:

- 1) Characteristic compressive strength at 28 days - 25 MPa
- 2) Maximum Aggregate size - 20 mm
- 3) Degree of workability -0.8 CF
- 4) Quality control - Good
- 5) Type of Exposure - Mild

Test Data

Property	Cement	Coarse aggregate	Fine Aggregate
Specific Gravity	3.15	2.6	2.6
Water Absorption	-	0.5%	1%
Free moisture	-	-	2%

The Coarse aggregate used is angular type conforming to IS 383-1970 and the fine aggregate used belongs to grading Zone I as per the IS standards.

Assume any other missing data. (10 marks)

- 9. (a) Differentiate between direct and indirect tension test on concrete. (2 marks)
- (b) Explain the tests used to determine tensile strength of concrete? (8 marks)

OR

- 10. (a) What are the causes of corrosion of concrete? How can corrosion be prevented? (5 marks)
- (b) Explain the principle and procedure of Rebound Hammer Test? (5marks)

- 11. (a) What are the advantages of using Fly ash in concrete? (5 marks)
- (b) Explain how the use of fibers influence the properties of concrete? (5marks)

OR

- 12. (a) What is meant by highperformance concrete? (5 marks)
- (b) Write short note on mass concreting? (5 marks)

(4 x 10 marks =40 marks)