

**Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**Concrete Technology**

Time: 3 hrs.

Max. Marks: 80

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Any missing data may be suitably assumed.  
3. IS-10262 mix design code is allowed.*

**Module-1**

- 1 a. Briefly explain the manufacturing of cement by dry process using flow chart. (08 Marks)  
b. What are Bogue's compounds? Briefly explain their contribution towards gaining of strength of cement. (08 Marks)

**OR**

- 2 a. List the types of cement and briefly explain the properties and application of any four types of cement. (08 Marks)  
b. What are admixtures, classify them and briefly explain their role in concrete technology? (08 Marks)

**Module-2**

- 3 a. Define workability and briefly explain the factors influencing workability of concrete. (08 Marks)  
b. What are the effect of segregation and bleeding on the property of hardened concrete? (08 Marks)

**OR**

- 4 a. Explain the process of hydration of cement, its significance and the chemical reactions involved. (08 Marks)  
b. Enumerate the need of compaction in concreting and list the methods of compaction. (08 Marks)

**Module-3**

- 5 a. List the factors that affect the strength of hardened concrete and explain briefly any two of them. (08 Marks)  
b. Define:  
i) Elastic strain in concrete  
ii) Elastic modulus  
iii) Creep  
iv) Shrinkage. (08 Marks)

**OR**

- 6 a. What is maturity of concrete and briefly explain its significance in the gaining of strength of concrete? (08 Marks)  
b. List the tests that can be conducted on hardened concrete to check its strength and explain any one of them. (08 Marks)

**Module-4**

7 Design a concrete Mix for M<sub>xx</sub> grade of concrete as per IS 10262-2009 with following data:

i) Design stipulations

- Characteristic compressive strength required in field at 28 days  
- 20 MPa
- Max size of aggregate (angular) - 20mm
- Degree of workability - 0.9 compaction factor
- Degree of quality control - Good
- Type of exposure - Mild

ii) Test data for materials

- Specific gravity of cement - 3.15
- Specific gravity of coarse aggregates - 2.60
- Specific gravity fine aggregates - 2.60
- Water absorption for coarse aggregate - 0.50%
- Water absorption for fine aggregates - 1.0%
- Surface moisture for coarse aggregates - Nil
- Surface moisture for fine aggregates - 2.0%
- Sieve analysis of coarse aggregates - Confirming to table 2 of IS: 383
- Sieve analysis of fine aggregates - Confirming to zone – II of IS: 383

(16 Marks)

**OR**

8 What is the significance of concrete mix design and explain the steps involved in it?

(16 Marks)

**Module-5**

9 a. Write short notes on : i) Ferro cement ii) Self compacting concrete.

(08 Marks)

b. What is RMC? How its manufactured? Explain briefly.

(08 Marks)

**OR**

10 a. What is light weight concrete? State its advantages.

(08 Marks)

b. Write note on fibre reinforced concrete.

(08 Marks)