

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Sixth Semester

Civil Engineering

CE 6002 – CONCRETE TECHNOLOGY

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Mix design tables and charts are permitted.

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Name the major compounds of ordinary Portland cement and mention the approximate percentage of each.
2. What should be the qualities of water to be used in concrete making ?
3. What is meant by pozzolanic action ?
4. State the advantages and disadvantages of using super plasticizers in concrete ?
5. What are the objectives of a concrete mix design ?
6. Distinguish between Design mix and Nominal mix.
7. Why does a concrete cylinder fail at a lower stress than a concrete cube ?
8. What are the effect of water cement ratio on concrete strength and durability ?
9. Define : High Performance Concrete.
10. What is polymer concrete ? State its advantages.

PART - B (5 × 16 = 80 Marks)

11. (a) (i) What are the raw materials for the manufacture of cement? Mention their functions in the properties of cement. (6)
- (ii) Discuss the role of various major compounds of cement and its hydrated products in the properties of cement. (10)

OR

- (b) (i) What are the requirements of physical and mechanical properties of good coarse aggregate for concreting? (6)
- (ii) Explain any two methods of finding the abrasion value of a coarse aggregate. (10)
12. (a) (i) Name the various types of plasticizers used in concrete and discuss the action in detail. (10)
- (ii) List the materials used for air entrainment in concrete and describe their effects on the properties of concrete. (6)

OR

- (b) Discuss the effects of adding fly ash, silica fume and ground granulated blast furnace slag in concrete.
13. (a) What are the factors affecting proportioning of a concrete mix? Discuss each in detail.

OR

- (b) Design a concrete mix for reinforced concrete work for the following requirements using IS : 10262-2007 code.

Characteristic strength at 28 days : 35 MPa

Exposure condition : severe

Degree of workability : slump = 50 mm

Quality control : very good

Cement : OPC (specific gravity = 3.15)

Fine aggregate : zone II sand (specific gravity = 2.64)

Coarse aggregate : maximum size = 20mm (specific gravity = 2.7)

Water absorption of coarse aggregate = 1%

Free surface moisture in sand = 2%

Assume any data required.

14. (a) What is meant by Workability of Concrete ? Enumerate the various methods to ascertain the workability. Discuss anyone of them in brief.

OR

- (b) Explain the method of finding the flexural and split tensile strength for concrete.

15. (a) Brief the production of geo-polymer concrete and enlist the salient parameters affecting the compressive strength of geo-polymer concrete.

OR

- (b) Write short notes on :

- | | |
|----------------------------|-----|
| (i) Shotcrete | (4) |
| (ii) SIFCON | (4) |
| (iii) Ready mixed concrete | (4) |
| (iv) Ferrocement | (4) |