Civil Engineering

CONCRETE TECHNOLOGY

PART - A

1. What is known as clinker?
2. What is the requirements of grading of aggregate?
3. What is the purpose of an accelerator?
4. Write about Metakolin.
5. What is a nominal mix?
6. What are the data required for concrete mix design?
7. What are the causes of bleeding and segregation?
8. What are the factors affecting concrete strength?
9. What do you mean by high performance concrete?
10. State the advantages of ferrocement.

PART - B

11. a) i) Describe the hydration reaction of important Bogue compounds indicating the products of hydration.

    ii) Discuss the properties and chemical composition of low heat cement and sulphate resisting cement.

    b) i) Write short notes on qualities of water used for manufacture of concrete.

    ii) Describe the testing procedure of impact test on aggregate.

12. a) Explain action of superplasticizer in concrete. What is the difference between? plasticizers and superplasticizers?

    b) Explain various types of mineral admixture.

13. a) What are the properties of concrete related to the proportioning of concrete mix? Explain.

b) Design a concrete mix by BIS method with the following data:

i) Concrete Mix Design Stipulation.

a) Characteristic compressive strength required in the field at 28 days grade designation - M 25.

b) Nominal maximum size of aggregate - 20 mm.

c) Shape of CA - Angular.

d) Degree of workability required at site - 50-75 mm (slump)

e) Degree of quality control available at site - As per IS:456

f) Type of exposure the structure will be subjected to (as defined in

g) IS:456) - Mild.

h) Type of cement: PSC conforming IS:455

i) Method of concrete placing: pump able concrete.

ii) Test data of material (to be determined in the laboratory)

a) Specific gravity of cement - 3.15.

b) Specific gravity of FA - 2.64.

c) Specific gravity of CA - 2.84.

d) Aggregate is assumed to be in saturated surface dry condition.

e) Fine aggregates confirm to Zone II of IS - 383.

14. a) i) Define workability. Explain the factors affecting workability.

ii) Explain compacting factor test to determine the workability of concrete.

b) i) Draw the stress strain curve for concrete.

ii) Explain in detail about the determination of Young's Modulus.

15. a) i) What are the different ways to achieve light weight concrete?

ii) Describe how the following test influences in SCC.

A. V funnel test.

B. L box test.

b) i) Simplify the term SIFCON.

ii) Explain the methods and application of polymer concrete.

16. a) What are the important long-term properties of high strength concrete? Compare them with those of conventional concrete.

b) What is Geopolymer concrete? Explain its composition, mechanical properties, durability properties and application.