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2021

Concrete Technology

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

- Central Institute Of Technology
Kokrajhar :: Bodoland
ESTD. : 2006
असतो मा सत गमय
तमसो मा ज्योतिर्गमय
1. a) Define the following terms 10x2
- i) Creep of concrete
 - ii) Autogenous shrinkage
 - iii) Durability of concrete
 - iv) Physical durability
 - v) Alkali-silica reaction
 - vi) Steam curing
 - vii) Aggregate crushing value
 - viii) Bogue's compound
 - ix) Coarse aggregate
 - x) Bulking of sand
2. a) What are the chemical composition of Portland cement? 3
- b) What are the functions of lime and alumina in cement? What if these ingredients are in excess quantity? 4+4
- c) Define segregation, bleeding and laitance. How these are greatly reduced by air entrainment. 2+2+2+3
3. a) What is bond strength and fatigue strength? 4
- b) How destructive testing is different from non-destructive testing? 3+3
- c) Discuss the various factors affecting the strength of concrete. 5
- d) Discuss the stress strain behaviour of concrete under load. 5

4. a) Define workability and also enlist the factors effecting workability. How grading of aggregates effect workability. 2+2+2
- b) What is drying shrinkage and enlist the various factors affecting drying shrinkage? 3+3
- c) Concrete of poor quality will not be converted to good quality by adding admixture. Justify. 5
- d) What is the difference between OPC and PPC? 3
5. a) What are the benefits to the concrete that are ensured by proper curing? 3
- b) At what situation membrane curing of concrete is adapted? Discuss any two methods of membrane curing. 3+6
- c) What is the main purpose of the compaction of concrete? What problem results due to Poor compaction? 3+5
6. a) What are external vibrators? Name the type of vibrators used in the manufacturing of,
- (i) electric poles, railway sleepers
- (ii) bridge floors, road slabs
- (iii) pre-cast concrete parts in factories
- (iv) hollow blocks, solid concrete blocks and cavity blocks
- b) What do you understand by the stability Parameter in Fresh Concrete Rheology? 4
- c) Discuss the five phases of the hydration process. 5x2
7. a) What are the steps generally adopted to reduce slump loss 6
- b) Discuss the role of retarders in concrete according to 4 different suitable areas of application. 8
- c) What does the dimensional stability of a construction material refers to? For concrete, what are the phenomena that compromise its dimensional stability? 3+3