CBCS SCHEME

USN | | | | | | | | | | |

18CV44

Fourth Semester B.E. Degree Examination, June/July 2025
Concrete Technology

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of IS456, IS10262 are allowed.

Module-1

1 a. Describe any five field tests that can be done on cement. **(10 Marks)**

b. What are Bouge's compounds? Explain their role in setting and hardening process of cement. **(10 Marks)**

OR

2 a. Discuss the manufacturing process, properties and applications of M-sand in the construction industry evaluate its advantage and disadvantage compared to natural sand. **(10 Marks)**

b. What is meant by grading of aggregates? Explain the importance of size, shape and texture with respect to the coarse aggregate. **(10 Marks)**

Module-2

3 a. Explain the process of
i) Batching ii) Mixing iii) Transportation iv) Placing v) Cueing. **(10 Marks)**

b. Define the workability of concrete. What are the different test methods to determine the workability of concrete? Explain any two methods. **(10 Marks)**

OR

4 a. What is the necessity of curing concrete? Explain the following types of curing:
i) Membrane curing
ii) Application of heat. **(10 Marks)**

b. Explain segregation and bleeding. What are the effects of segregation and bleeding? How segregation and bleeding can be reduced? **(10 Marks)**

Module-3

5 a. Explain the maturity concept of concrete. What are its practical uses in the concrete industry? **(10 Marks)**

b. Define water to cement ratio. Explain how w/c ratio affects the strength of concrete. **(05 Marks)**

c. Discuss the concept of gel/space ratio, explain the factors influencing the strength of concrete. **(05 Marks)**

OR

6 a. Explain the concept of carbonation in concrete and its potential effects on reinforced concrete structures. Discuss the factors that influence the rate of carbonation and the measures that can be taken to mitigate its harmful effects on concrete structures. **(10 Marks)**

b. Discuss about the durability of concrete in sea water. **(10 Marks)**

Module-4

7 a. Explain the concept of mix design. Explain the different methods of mix proportioning. **(12 Marks)**

b. Explain the significance of concrete mix design in modern concrete industry. **(08 Marks)**

OR

8 Discuss a concrete mix by IS method for M-30 grade concrete as per IS-10262-2019.

a. Grade : M30
b. Cement : OPC 53 grade
c. Maximum nominal size of aggregate = 20 mm
d. Minimum cement content : 320 kg/m^3
e. Maximum w/c ratio : 0.45
f. Workability : 100 mm slump
g. Exposure condition : severe [Reinforced concrete]
h. Method of concrete placing : Pumping
i. Degree of supervision : Good
j. Type of aggregate : crushed angular
k. Maximum cement content: 450 kg/m^3
l. Chemical admixture : super plasticizers

Test data for material

i) Specific gravity of cement : 3.15
ii) Specific gravity of C.A : 2.74
iii) Specific gravity of F.A : 2.72
iv) Water absorption for
   I. C.A : 0.5%
   II. F.A : 1.5%
v) Free surface moisture
   I. C.A : NIL
   II. F.A : 2.0%
vi) Grading of fine aggregate : zone III **(20 Marks)**

Module-5

9 a. Define RMC what are the requirements of RMC. Briefly discuss the advantages and disadvantages of RMC. **(10 Marks)**

b. Define self compacting concrete. Explain the properties of self compacting concrete and the need for self compacting concrete in the construction industry. **(10 Marks)**

OR

10 a. Explain the types of fibers used in fiber reinforced concrete and its applications. **(10 Marks)**

b. Explain the following types of special concrete characteristics and circumstances under which they are preferred:

i) Geo polymer concrete
ii) High performance concrete. **(10 Marks)**

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