

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2023**

**CONCRETE TECHNOLOGY**

[Maximum Marks: **100**]

[Time: **3 Hours**]

**PART-A**

[Maximum Marks: **10**]

I. (Answer **all** questions in one or two sentences. Each question carries **2** marks)

1. Define bulking of sand.
2. Differentiate between the modular ratio and Poisson's ratio.
3. Write the relationship between target strength and mean strength of concrete.
4. Define the term freezing and thawing of concrete.
5. Define Geopolymer concrete. (5 x 2 = 10)

**PART-B**

[Maximum Marks: **30**]

II. (Answer **any five** of the following questions. Each question carries **6** marks)

1. List the ingredients of cement with percentages.
2. Explain the field tests for cement testing.
3. State the important properties of hardened concrete.
4. Describe the test procedure to determine the split tensile strength of concrete.
5. List the variable parameters of the mix design.
6. Explain the requirements of mix design.
7. Explain the carbonation of concrete. (5 x 6 = 30)

**PART-C**

[Maximum Marks: **60**]

(Answer **one** full question from each Unit. Each full question carries **15** marks)

**UNIT – I**

- III. a. List the laboratory tests of cement and explain any one in detail. (9)  
b. Define heat of hydration of cement. (6)

**OR**

- IV. a. Explain any three laboratory tests of aggregates. (9)  
b. Differentiate between chemical admixtures and mineral admixtures. (6)

## UNIT – II

- V. a. Explain slump test and compaction factor test for the workability of concrete in detail. (9)  
b. Explain different modulus of elasticity of concrete. (6)

**OR**

- VI. a. Define curing and explain any four methods of curing. (9)  
b. List the factors affecting the strength of concrete. (6)

## UNIT- III

- VII. a. Memorize the terms mean strength, Variance, Coefficient of variation and Standard deviation. (9)  
b. List the factors influencing the mix proportion of cement concrete. (6)

**OR**

- VIII. Design a concrete mix of grade M30 as per IS 10262 for the following data.  
Maximum size of aggregate =20mm (angular), Workability =75mm slump  
Exposure conditions= Severe, Method of concrete placing =Pumping  
Cement used= OPC 43 grade, Specific gravity of cement= 3.15,  
Specific gravity of CA= 2.65, of FA= 2.60, Water absorption of CA= 0.50%,  
Water absorption of FA= 1.0%, Surface moisture of CA= Nil and of FA =Nil  
River sand conforming to Zone I, Chemical admixture used = Superplasticizer of Sp.  
Gravity = 1.145. Any suitable data may be assumed. (15)

## UNIT - IV

- IX. a. Explain in detail about any three special concretes used in construction. (9)  
b. Identify the situations where special care has to be taken while concreting. (6)

**OR**

- X. a. List the factors affecting permeability of concrete and list the remedies to control permeability. (9)  
b. List the factors affecting the durability of concrete. (6)

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