



BRAINWARE UNIVERSITY

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Brainware University
398, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125

Term End Examination 2024-2025
Programme – Dip.CE-2022/Dip.CE-2023
Course Name – Concrete Technology
Course Code - DCEPC304
(Semester III)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Identify the laboratory test that measures the particle size of cement particles:
 - a) Fineness test
 - b) Standard consistency test
 - c) Setting time test
 - d) Compressive strength test
- (ii) Identify the test that determines the water content required to form a standard consistency paste with cement:
 - a) Fineness test
 - b) Standard consistency test
 - c) Setting time test
 - d) Soundness test
- (iii) Identify the test that evaluates the soundness of cement by subjecting it to autoclave pressure and temperature:
 - a) Fineness test
 - b) Standard consistency test
 - c) Setting time test
 - d) Autoclave test
- (iv) Identify the compressive strength testing age typically used for assessing cement mortar or concrete:
 - a) 1 day
 - b) 3 days
 - c) 7 days
 - d) 28 days
- (v) Identify the requirement of good aggregate that ensures it is free from impurities like clay, silt, and organic matter:
 - a) Cleanliness
 - b) Hardness
 - c) Porosity
 - d) Gradation
- (vi) Identify the requirement of good aggregate that relates to its ability to resist wear and abrasion:
 - a) Cleanliness
 - b) Hardness
 - c) Porosity
 - d) Gradation
- (vii) Identify the size range that typically classifies coarse aggregates used in concrete:
 - a) 0.075 mm to 4.75 mm
 - b) 5 mm to 20 mm
 - c) 20 mm to 40 mm
 - d) 40 mm to 80 mm

- (viii) Identify the primary factor that can significantly impact the durability of concrete in aggressive environments:
- a) High compressive strength
 - b) Low water-cement ratio
 - c) Smooth surface finish
 - d) Low cement content
- (ix) Identify the type of deterioration in concrete that results from the expansion and cracking due to freeze-thaw cycles:
- a) Efflorescence
 - b) Carbonation
 - c) Alkali-silica reaction
 - d) Frost action
- (x) Identify the test commonly used to assess the permeability of concrete by measuring the flow of water through the specimen:
- a) Slump test
 - b) Chloride ion penetration test
 - c) Water absorption test
 - d) Permeability test
- (xi) Select the method of mix design that involves varying the proportions of ingredients systematically to achieve the desired properties:
- a) ACI method
 - b) DOE method
 - c) IS 10262 method
 - d) Trial and error method
- (xii) Select the unit of measurement typically used in the Rebound Hammer Test to express the results:
- a) Megapascals (MPa)
 - b) Meters per second (m/s)
 - c) Hounsfield units (HU)
 - d) Decibels (dB)
- (xiii) Select the primary purpose of the mixing process in concrete production:
- a) To transport concrete
 - b) To place concrete
 - c) To remove air voids
 - d) To homogenize ingredients
- (xiv) Choose the type of joint designed to control cracking caused by drying shrinkage in concrete:
- a) Contraction joint
 - b) Isolation joint
 - c) Expansion joint
 - d) Control joint
- (xv) Choose the method used for joining old and new concrete by drilling holes into the existing concrete and inserting steel bars or rods:
- a) Bonding agent
 - b) Epoxy injection
 - c) Dowel bars
 - d) Keying

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Define the term fineness when discussing cement quality. (3)
3. Explain compressive strength of cement and its significance. (3)
4. Explain the slump test. (3)
5. Explain the compacting factor test. (3)
6. Explain how bulking of sand affects the volume of sand when moistened. (3)

OR

Analyze why water absorption is important to consider when using sand in concrete production. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Analyze the factors that could affect the accuracy of results in the rebound hammer test. (5)
8. Explain how the rebound number value is interpreted in the rebound hammer test. (5)
9. List the necessity of using admixture. (5)
10. Discuss the purpose of compaction in concrete placement. (5)
11. Write a short note on self-compacting concrete. (5)

12. Conclude the possible problems that may arise due to segregation.

(5)

OR

Conclude the possible problems that may arise due to bleeding.

(5)

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