Unit 13 - Week 11 - Durability of concrete - 1

Assignment 11

Due on 2019-10-16, 23:59 IST.

1) Which of these factors affect both permeability and porosity of concrete? 
   - Water to cement ratio
   - Use of portland cement
   - Use of lightweight aggregate
   - Degree of curing

   Accepted Answers: Water to cement ratio, Use of portland cement, Degree of curing

2) Identify the equation which provides relationship between porosity and permeability (Kozeny equation).
   \[ \frac{1}{\varepsilon^2} = \frac{9K}{4}\phi (1-\phi) \]

   Accepted Answers: \[ \frac{1}{\varepsilon^2} = \frac{9K}{4}\phi (1-\phi) \]

3) Which of the following parameters are used to define performance based specifications?
   (i) Shrinkage
   (ii) Strength of the concrete
   (iii) Air content
   (iv) Water absorption

   Accepted Answers: (i), (ii), (iii), (iv)

4) Near-surface concrete quality is largely responsible for the strength of the structure.
   - True
   - False

   No, the answer is incorrect.

5) The limiting value of water penetration depth mentioned in Eurocode 2 is: 
   - 20 mm
   - 30 mm
   - 40 mm
   - 50 mm

   Accepted Answers: 20 mm

6) Which of the following tests are not prescribed in IS 456 for inspection and testing of concrete quality?
   - Ultimate pulse velocity test
   - Mercury intrusion porosimetry test
   - Compressive strength test
   - Crane test

   Accepted Answers: Ultimate pulse velocity test, Mercury intrusion porosimetry test, Compressive strength test

7) In MIP, an immersion, which compound forms as a layer on the surface of the concrete and prevents further attack for a while?
   - Magnesium chloride
   - Magnesium oxide
   - Magnesium hydroxide
   - Magnesium bromide

   Accepted Answers: Magnesium oxide

8) Which of the following deterioration mechanisms in concrete is associated with gypsum formation, softening and strength loss?
   - Chloride ingress
   - Carbonation
   - Sulphate attack
   - Acid attack

   Accepted Answers: Chloride ingress, Carbonation, Sulphate attack

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   Accepted Answers: Chloride ingress, Carbonation, Sulphate attack

10) Delayed ettringite formation in concrete can be controlled when the temperature inside the concrete is maintained above 70°C.
    - True
    - False

    No, the answer is incorrect.