

Q1 Which one of the following properties of cement concrete is ascertained by conducting compaction factor test?

- (a) Bulk density
- (b) Compressive strength
- (c) Modulus of rupture
- (d) Workability

Q2 The mix design for pavement concrete is based on

- (a) the flexural strength
- (b) The characteristics compressive strength
- (c) The shear strength
- (d) The bond strength

Q3 In what context is the slump test performed?

- (a) Strength of concrete
- (b) Workability of concrete
- (c) Water-cement ratio
- (d) Durability of concrete

Q4 Consider the following statements:

The use of super plasticizers as admixture.

1. increases compressive strength of concrete
2. permits lower water-cement ratio, thereby strength is increase
3. reduces the setting time of concrete
4. permits lower cement content, thereby strength is increased

Which of the statements given above is/are correct?

- (a) 1 and 3 only
- (b) 3 and 4 only
- (c) 1, 3 and 4 only
- (d) 2 only

Q5 Consider the following statements:

Curing of concrete is necessary because

1. Concrete needs more water for chemical reaction
2. It is necessary to protect the water initially mixed in concrete from being lost during evaporation
3. Penetration of surrounding water increases the strength of concrete

Which of the statements given above is/are correct?

- (a) 1,2 and 3 only
- (b) 1 and 3 only
- (c) 2 only
- (d) 3 only

Q6 Consider the following statements:

Modulus of elasticity of concrete is

1. tangent modulus
2. secant modulus

3. proportional to $\sqrt{f_{ck}}$
4. proportional to $1 / \sqrt{f_{ck}}$

Which of the statements given above are correct?

- (a) 1 and 3 only (b) 1 and 4 only
(c) 2 and 3 only (d) 2 and 4 only

Q7 Which one of the following is employed to determine strength of hardened existing concrete structure?

- (a) Bullet test
(b) Kelly ball test
(c) Rebound hammer test
(d) Cone penetrometer

Q8 Which one of the following is the correct expression for the target mean strength f_t of concrete mix?

- (a) $f_t = k_{ck} k + S$ (b) $f_t = f_{ck} + kS$
(c) $f_t = f_{ck} + S$ (d) $f_t = kf_{ck} + k$

where f_{ck} is characteristic strength, K is probability factor and S is standard deviation

Q9 Which of the following pairs are correctly matched?

1. **Particle size**: Affects and texture workability
2. **Absorption and** : Affects mix proportions surface moisture
3. **Grading** : Maximizes cement content
4. **Bulk density** : Significant for stability

Select the correct answer using the code given below:

- (a) 1 and 2 (b) 2 and 3
(c) 3 and 4 (d) 1 and 3

Q10 Consider the following statements:

1. Rise in temperature does not cause any change in the colour of cement concrete
2. Curing minimizes the shrinkage of cement concrete when it sets.

Which of the statements given above is/are correct?

- (a) 1 only
(b) 2 only
(c) Both 1 and 2

(d) Neither 1 nor 2

Q11 What is the percentage of the fine aggregate of fineness modulus 2.6 to be combined with coarse aggregate of fineness modulus 6.8 for obtaining combined aggregate of fineness modulus 5.4?

- (a) 30%
- (b) 40%
- (c) 50%
- (d) 60%

Q12 Match List I (Admixture) with List II (Action in concrete) and select the correct answer using the code given below the lists:

List – I

- | | |
|----------------------------|------------------|
| A. Calcium lignosulphonate | 1. Accelerators |
| B. Aluminium powders | 2. Retarder |
| C. Tartaric acid | 3. Air entrainer |
| D. Sodium silicate | 4. Water reducer |

Codes :

- a. A – 1, B – 3, C – 2, D – 4
- b. A – 4, B – 3, C – 2, D – 1
- c. A – 4, B – 2, C – 3, D – 1
- d. A – 1, B – 2, C – 3, D – 4

Q13 Which factors influence the workability of concrete without sacrificing strength?

- 1. Fine aggregate
- 2. Quantity of mixing water
- 3. Maximum size of coarse aggregate
- 4. Shape of coarse aggregate

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 only
- (c) 1 and 2
- (d) 3 and 4

Q14 The workability of concrete can be increased by which of the following?

- 1. Increasing the quantity of coarse aggregate without altering the total aggregate quantity.

2. Decreasing the quantity of coarse aggregate and at the same time correspondingly increasing the quantity of fine aggregate
3. Using round aggregate

Select the correct answer using the code given below

- (a) 1 and 3 only (b) 1 and 2 only
(c) 2 and 3 only (d) 1, 2 and 3

Q15 Consider the following statements regarding cement concrete

1. Bleeding indicates deficiency of coarser materials in the mix.
2. Segregation generally indicates poor aggregate grading

Which of the statements given above is/are correct?

- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Q16 Match the sequence of determination of components of a concrete mix as per Indian standard method of mix design and select the correct answer using the code given below the lists:

List – I

- A. Cement content
B. Aggregate content
C. Water content
D. Water-cement ratio

List – II

1. First step
2. Second step
3. Third step
4. Fourth step

Codes :

- a. A – 1, B – 2, C – 4, D – 3
b. A – 3, B – 2, C – 4, D – 1
c. A – 3, B – 4, C – 2, D – 1
d. A – 1, B – 4, C – 2, D – 3

Q17 Which factors comprise maturity of concrete?

- (a) Compressive strength and flexural strength of concrete
(b) Cement content per cubic metre and compressive strength of concrete
(c) Curing age and curing temperature of concrete
(d) Age and aggregate content per cubic metre of concrete

Q18 What is the minimum value of individual test results (in N/mm²) for compressive strength

compliance requirement for concrete M20 as per codal provision?

- (a) $f_{ck}-1$
- (b) $f_{ck}-3$
- (c) $f_{ck}-4$
- (d) $f_{ck}-5$

Q19 What is the ratio of flexural strength (f_{cr}) to the characteristic compressive strength of concrete (f_{ck}) for M25 grade concrete?

- (a) 0.08
- (b) 0.11
- (c) 0.14
- (d) 0.17

Q20 Which of the following tests compares the dynamic modulus of elasticity of samples of concrete?

- (a) Compression test
- (b) Ultrasonic pulse velocity test
- (c) Split test
- (d) Tension test

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