Test

Construction Materials and Management

Time: 60 Minutes

1. The bearing strength of M25 grade concrete in limit state method of design as per IS 456–2000 is
(A) 25 MPa (B) 11.25 MPa
(C) 15 MPa (D) None of these

2. Modulus of Elasticity of M30 grade concrete is
(A) 25000 N/mm^2 (B) 27386 N/mm^2
(C) 30000 N/mm^2 (D) None of these

3. Flexural tensile strength of M25 grade concrete as per IS 456–2000 is
(A) 12.5 N/mm^2 (B) 25 N/mm^2
(C) 22.5 N/mm^2 (D) 3.5 N/mm^2

4. Minimum grade of concrete used for pre-tensioned and post-tensioned pre-stressed concrete are
(A) M40 and M30 (B) M40 and M20
(C) M30 and M40 (D) None of these

5. The 7-days strength of M30 grade concrete should be at least
(A) 30 MPa (B) 20 MPa
(C) 25 MPa (D) none

6. The target mean strength (f_m) for concrete mix design obtained from the characteristic strength (f_{ck}) and standard deviation (σ) as defined in IS456–2000 is
(A) $f_{ck} + 1.35\sigma$ (B) $f_{ck} + 1.65\sigma$
(C) $f_{ck} + 1.45\sigma$ (D) $f_{ck} + 1.55\sigma$

7. Minimum cement content to be used in Reinforced cement concrete for mild exposure is
(A) 300 kg/m^3 (B) 320 kg/m^3
(C) 340 kg/m^3 (D) 450 kg/m^3

8. Nominal cover to main reinforcement in case of slabs with mild exposure should be
(A) 30 mm (B) 25 mm
(C) 20 mm (D) 40 mm

9. The individual variation in compressive strength of three cubes in the sample should not exceed
(A) ±10% (B) ±15%
(C) ±20% (D) ±25%

10. The pozzolanas added to improve the properties of concrete are
(A) fly ash (B) silica fume
(C) slag (D) All of these

11. Which of the following statements regarding the cube strength of concrete are correct?
I. Strength increases with decrease in cube size
II. Strength decreases with increase in slenderness ratio
III. Strength increases with increase in slenderness ratio
IV. Strength decreases with decreases in cube size
(A) I and II are correct
(B) I, II, III are correct
(C) I and III are correct
(D) All of these

12. Which of the following statements regarding properties of concrete are correct?
I. Modulus of elasticity of M25 grade of concrete is 25000 MPa.
II. Approximate value of shrinkage strain of concrete is 0.0003.
III. pH value of water used in concrete construction should not be less than 6.
(A) I and II are correct
(B) I and III are correct
(C) II and III are correct
(D) All of these

13. The long term modulus of elasticity of M25 grade concrete with θ value at 7 days to be 2.2 is
(A) 25000 MPa (B) 7812.5 MPa
(C) 3500 MPa (D) None of these

14. The probability of failure of a structure as per IS456–2000 (according to the concept of limit state design) is _____.
(A) 0.0975 (B) 0.95
(C) 0.975 (D) 0.20

15. Group I contains some properties of concrete/cement and Group II contains list of some tests on concrete/cement.

Match the property with corresponding test.

	Group I		Group II
P.	Direct tensile strength of concrete	1.	Cylinder splitting test
Q.	Workability of concrete	2.	Surface area test
R.	Bond between steel and concrete	3.	Vee–bee tests
S.	Fineness of cement	4.	Fineness modulus test
		5.	Pullout test

Codes:

	P	Q	R	S		P	Q	R	S
(A)	1	3	5	4	(B)	5	2	1	3
(C)	2	3	1	4	(D)	2	1	5	3

16. Consider the following statements regarding the air entrained concrete?
I. Increased resistance to freezing and thawing.
II. Improvement in workability.
III. Increase in strength.
IV. Permits reduction in water content.

Of these,
(A) I, II, IV are correct
(B) II, III, IV are correct
(C) I, III, IV are correct
(D) All of these

17. Which of the following statements regarding admixtures are correct?
(A) Retards the setting of cement
(B) Accelerates the setting of cement
(C) Improves the workability of concrete
(D) All of these

18. Consider the following statements:
I. The compressive strength of concrete decreases with increase in water cement ratio of the concrete mix.
II. Water is added to the concrete mix for hydration of cement and workability.
III. Creep and shrinkage of concrete are independent of the water cement ratio in the concrete mix.
The true statements are
(A) I and III (B) I, II, III
(C) II and III (D) I and II

19. Consider the following statements:
I. Modulus of elasticity of concrete increases with increase in compressive strength of concrete
II. Brittleness of concrete increases with decrease in compressive strength of concrete.
III. Shear strength of concrete increases with increase in compressive strength of concrete.
The true statements are
(A) I and III (B) I, II, III
(C) II and III (D) I and II

20. Consider the following statements:
I. Nominal mix proportions for M20 grade concrete is 1 : 1.5 : 3.
II. Weight batching is preferred compared to nominal (volume) batching.
III. Maximum cement content as per IS456–2000 is 450 kg/m^3.
(A) I, II are correct (B) I, III are correct
(C) II, III are correct (D) I, II and III are correct

21. Which of the following statements given below are correct?
I. Nominal cover to reinforcement is based on serviceability or durability requirements.
II. Factors affecting the durability of concrete are w/c and maximum cement content.
III. Minimum cement content is not based on exposure conditions.
(A) I, II, III are correct
(B) I and II are correct
(C) I and III are correct
(D) only I is correct

22. Consider the following statements regarding the addition of pozzolanas to cement causes
I. increase in strength.
II. less heat of hydration.
III. decrease in workability.
The true statements are
(A) I, II, III are correct
(B) I and II are correct
(C) I and III are correct
(D) Only II is correct

23. The composition of air entrained concrete is given below:
Water: 180 kg/m^3
Ordinary Portland cement: 360 kg/m^3
Sand: 601 kg/m^3
Coarse aggregate: 1160 kg/m^3
Assume the specific gravity of OPC, sand and coarse aggregate to be 3.10, 2.65 and 2.74 respectively, the air content in lit/m^3 is _____.
(A) 53 (B) 50
(C) 45 (D) None of these

24. Consider the following statements:
I. Nominal maximum size of coarse aggregate to be used in RCC is 20 mm.
II. As per IS456–2000; fine sand to be used in RCC should confirm to zone II and medium sand.
III. Minimum grade of concrete to be used in RCC is M30.
The true statements are
(A) I and II are true (B) I and III are true
(C) I, II and III are true (D) II and III are true

25. Which of the following statements given below are correct?
I. In mild environment, surface crack width should not exceed 0.3 mm as per IS456–2000.
II. Crack width increases with increase in stress in reinforcement bar.
III. Concrete and steel exhibit high strength after being subjected to high temperature.
(A) I and III are correct
(B) I, II and III are correct
(C) I and II are correct
(D) None of these

Answer Keys

1. B	**2.** B	**3.** D	**4.** A	**5.** B	**6.** B	**7.** A	**8.** C	**9.** B	**10.** D
11. A	**12.** D	**13.** B	**14.** A	**15.** A	**16.** A	**17.** D	**18.** D	**19.** B	**20.** D
21. B	**22.** D	**23.** A	**24.** A	**25.** C					