OPSC 2019

Odisha Public Service Commission

Civil Engineering

Objective Practice Sets

RCC & Prestressed Concrete

Contents

MADE EASY Publications

1 CHAPTER
Introduction

Q.1 The values of partial safety factor for dead load and live load in limit state of collapse are
(a) 1.5 and 1.1 (b) 1.5 and 1.0
(c) 1.0 and 1.5 (d) 1.5 and 1.5

Q.2 In the limit state of collapse, the values of partial safety factor for concrete and steel are
(a) 1.67 and 0.87 (b) 1.5 and 1.15
(c) 1.15 and 1.5 (d) 0.87 and 1.67

Q.3 The minimum strain in concrete at the outer most compression fibre in the limit state design of flexure is
(a) 0.003 (b) 0.002
(c) 0.0035 (d) 0.0015

Q.4 The maximum strain in tension reinforcement in the section at failure, in limit state of collapse, shall not be less than
(a) $\frac{f_y}{E_s} + 0.002$ (b) $\frac{0.87f_y}{E_s} + 0.002$
(c) $\frac{0.87f_y}{E_s} + 0.0035$ (d) $\frac{f_y}{E_s} + 0.0035$

Q.5 The maximum compressive strain in concrete in axial compression in limit state of collapse is
(a) 0.0035 (b) 0.0015
(c) 0.0025 (d) 0.002

Q.6 Meridional thrust in a spherical dome subjected to a concentrated load or uniformly distributed load, is always
(a) tensile (b) compressive
(c) zero (d) none of the above

Q.7 Which type of wires have high tensile strength?
(a) Heat treated wires
(b) Plain cold drawn wires
(c) Plain hot drawn wires
(d) None of the above

Q.8 Sinking of an intermediate support of a continuous beam
1. reduces the negative moment at support.
2. increases the negative moment at support.
3. reduces the positive moment at centre of span.
4. increases the positive moment at centre of span.

Which of these statements is/are correct?
(a) 1 and 3 (b) 1 and 4
(c) 2 and 3 (d) 2 and 4

Q.9 In a counterfort retaining wall, the main reinforcement is provided on the
1. bottom face in front counterfort
2. inclined face in front counterfort
3. bottom face in back counterfort
4. inclined face in back counterfort

Which of these statements are correct?
(a) 1 and 2 (b) 2 and 3
(c) 1 and 4 (d) 3 and 4

Q.10 Match **List-I** with **List-II** and select the correct answer using the codes given below the lists:

List-I
A. Continuous bridge
B. Causeways
C. Economic span
D. Viaduct

List-II
1. Used for deciding the number of piers
2. Bridge to enable road to pass over a cutting
3. Used for large spans
4. To allow flood water to pass over

Codes:

	A	B	C	D
(a)	3	4	1	2
(b)	1	2	3	4
(c)	3	1	4	2
(d)	1	3	2	4

Q.11 Which of the following are not dependent on the applied load?
1. Elastic strain
2. Creep strain
3. Drying shrinkage strain
4. Carbonation shrinkage

Select the correct answer using the codes given below:
(a) 1 and 2 (b) 2 and 3
(c) 3 and 4 (d) 1 and 4

Directions: The following items consists of two statements; one labelled as **'Assertion (A)'** and the other as **'Reason (R)'**. You are to examine these two statements carefully and select the answers to these items using the codes given below:

Codes:
(a) both A and R are true and R is the correct explanation of A
(b) both A and R are true but R is not a correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

Q.12 **Assertion (A) :** The load factor for live load is greater than that for dead load.
Reason (R) : The live loads are more uncertain than dead loads.

Q.13 **Assertion (A) :** For determining uniaxial compressive strength of concrete, cube is a better test specimen as compared to cylinder.
Reason (R) : Stress distribution is more uniform over the cross-section of a cylinder as compared to cube.

Q.14 **Assertion (A) :** The stress block used in the limit state design method is obtained by testing of concrete cylinder under uniform rate of strain.
Reason (R) : If a uniform rate of strain is not adopted it is not possible to obtain the descending portion of stress-strain curve beyond maximum stress.

Q.15 What should be the minimum grade of reinforced concrete in and around sea coast construction?
(a) M 35 (b) M 30
(c) M 25 (d) M 20

Q.16 Match **List-I** with **List-II** and select the correct answer using the codes given below the lists :

List-I
A. Moment and shear coefficients
B. Fire resistance
C. Sliding
D. Span to depth ratio of beam

List-II
1. Durability
2. Stability
3. Analysis of structure
4. Deflection limits

Codes:

	A	B	C	D
(a)	4	2	1	3
(b)	3	2	1	4
(c)	4	1	2	3
(d)	3	1	2	4

Q.17 In ultimate load design method, the load factors for dead load and live load are
(a) 2.2 and 1.5 (b) 1.5 and 1.0
(c) 1.5 and 2.2 (d) 1.0 and 1.5

Q.18 The modulus of elasticity of cement concrete can be assumed as per **IS 456 : 2000** as:
(a) $5000\sqrt{f_{ck}}$ (b) $5700\sqrt{f_{ck}}$
(c) $6300\sqrt{f_{ck}}$ (d) $7200\sqrt{f_{ck}}$

Q.19 Given that d = effective depth, b = width and D = overall depth, the maximum area of compression reinforcement in a beam is
(a) $0.04bd$ (b) $0.04bD$
(c) $0.12bd$ (d) $0.12bD$

Q.20 According to IS : 456, the partial safety factor for concrete is taken as
(a) 0.87 (b) 1.15
(c) 1.50 (d) 3.00

Q.21 The most economical type of RCC beam is
(a) singly reinforced rectangular beam.
(b) singly reinforced T-beam.
(c) doubly reinforced rectangular beam.
(d) doubly reinforced T-beam.

Q.22 The distance between main bars in a simply supported slab should not exceed by
(a) three times of effective depth.
(b) four times of effective depth.
(c) five times of effective depth.
(d) six times of effective depth.

Q.23 A simply supported beam is considered a deep beam if the ratio of effective span to overall depth is less than
(a) 1 (b) 4
(c) 3 (d) 2

Q.24 Poission's ratio of concrete
(a) remains constant.
(b) increases with richer mixes.
(c) decreases with richer mixes.
(d) None of the above.

Q.25 As the span of a bridge increases, how does the impact factor vary?
(a) Increases
(b) Constant
(c) Decreases
(d) Increase upto critical value and then decreases

Q.26 Match **List-I** with **List-II** and select the correct answer using the codes given below the lists :

List-I	List-II
A. IS 875	1. Earthquake design
B. IS 1343	2. Loads
C. IS 1893	3. Liquid storage structure
D. IS 3370	4. Prestressed concrete

Codes:

	A	B	C	D
(a)	3	1	4	2
(b)	2	1	4	3
(c)	2	4	1	3
(d)	2	4	1	3

Q.27 With the increase in rate of loading during testing, compressive strength of concrete
(a) increases.
(b) does not change.
(c) decrease.
(d) none of the above.

■■■■

Answers Introduction

1. (d)	2. (b)	3. (c)	4. (b)	5. (d)	6. (b)	7. (b)	8. (b)	9. (a)	10. (a)
11. (c)	12. (d)	13. (d)	14. (a)	15. (b)	16. (d)	17. (c)	18. (a)	19. (b)	20. (c)
21. (d)	22. (a)	23. (d)	24. (b)	25. (c)	26. (c)	27. (a)			

Explanations Introduction

5. (d)
Refer clause 39.1 of **IS 456 : 2000**.

13. (d)
Cylinder is a better test specimen as compared to cube for determinining uniaxial compressive strength of concrete since restraing effect of plates is less in case of cylinder as compared to cube.

15. (b)

Exposure	Minimum grade of plain concrete	Minimum grade of reinforced concrete
(i) Mild	—	M20
(ii) Moderate	M15	M25
(iii) Severe	M20	M30
(iv) Very severe	M20	M35
(v) Extreme	M25	M40