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Q : 1) A cantilever beam 'A' with rectangular cross section is subjected to a concentrated load at its free end. If the width and depth of another cantilever beam 'B' are twice those of beam 'A' and subjected to the same load, then the deflection at the free end of the beam 'B' as compared to that of 'A' will be

A : 6.25%

B : 14.0%

C : 23.6%

D : 28.0%

Q : 2) Permissible deviation from specified dimensions of cross-section of column & beams as per IS standards is _____ mm

A : +10 mm – 4 mm

B : + 12 mm – 6 mm

C : + 14 mm – 8 mm

D : None

Q : 3) Flexural collapse in over reinforced beams is due to:

A : Primary compression failure

B : Secondary compression failure

C : Primary tension failure

D : Bond failure

Q : 4) Shrinkage deflection in case of rectangular beams and slabs can be eliminated by putting

A : Compression steel equal to tensile steel

B : Compression steel more than tensile steel

C : Compression steel less than tensile steel

D : Compression steel 25% more than tensile steel

Q : 5) Which of the following are correct for cover to reinforcement?

- 1. The reinforcement shall have a minimum clear cover of 20 mm or diameter of such bar whichever is more.**
- 2. At each end of reinforcing bar not less than 25 mm nor less than twice the diameter of such bar.**
- 3. Increased cover thickness may be provided when surface of concrete is exposed to the action of harmful chemical.**

A : 1, 2 and 3

B : 1 and 2 only

C : 1 and 3 only

D : 2 and 3 only

Q : 6) The minimum vertical space of the main reinforcement in RCC beam is

A : The diameter of the larger bar or 5 mm more than the nominal maximum size of the coarse aggregate

B : The diameter of the larger bar or two-thirds the nominal maximum size of the coarse aggregate

C : 5 mm more than the diameter of the bar

D : 15 mm

Q : 7) For a given grade of steel, the limiting reinforcement index for a singly reinforced beam is proportional to

A : f_{ck}

B : f_y

C : f_y/f_{ck}

D : f_{ck}/f_y

Q : 8) As per IS 456-2000, for the design of reinforced concrete beam, the maximum allowable shear stress (τ_{max}) depends on the

A : Grade of concrete and grade of steel

B : Grade of steel only

C : Grade of concrete and percentage of reinforcement

D : Grade of concrete only

Q : 9) Which of the following is the result of unequal top and bottom reinforcement in a reinforced concrete section?

A : Shrinkage deflection

B : Large deflection

C : Long-term deflection

D : Creep deflection

Q : 10) The maximum diameter of a bar used in a ribbed slab is

A : 12 mm

B : 6 mm

C : 20 mm

D : 22 mm

Q : 11) A circular slab subjected to external loading deflects to form

A : Semi hemisphere

B : Ellipsoid

C : Paraboloid

D : None of these

Q : 12) The thickness of slab and beams must be measured to the nearest:

A : 0.001 m

B : 0.005 m

C : 0.1 m

D : 0.05 m

Q : 13) The effective width of a column strip of a flat slab that is taken into consideration is

A : ne fourth the width of the panel

B : Half the width of the panel

C : Radius of the column

D : Diameter of the column

Q : 14) In case of one-way continuous slab, maximum bending moment will be at :

A : Mid of end span

B : Interior support other than next to end support

C : End support

D : A support next to end support

Q : 15) Bending moment coefficient for slabs spanning in two directions at right angle and simply supported on all four sides are given in the table.

α_x	0.062	0.074	0.084
α_y	0.062	0.061	0.054
l_y/l_x	1.0	1.0	1.2

If effective longer and shorter span of the slab are 4.4 m and 4 m respectively and factored load acting is 8 kN/m², ultimate bending moment per metre width acting in two directions will be

A : 9.47 kN-m and 12.72 kN-m

B : 9.47 kN-m and 7.81 kN-m

C : 11.46 kN-m and 9.47 kN-m

D : 11.46 kN-m and 8.45 kN-m

Q : 16) Among the different ways of providing reinforcement in reinforced cement concrete beam, identify the one that does not contribute to improve the shear resistance of the beam section.

A : Reinforcement provided in tension zone which extend into the support

B : Reinforcement provided in compression zone which extend into the support

C : Bent-up reinforcement

D : Vertical or inclined stirrups

Q : 17) For design purposes, the width of one way slab is always taken as

A : 1 mm

B : 100 mm

C : 1000 mm

D : 2000 mm

Q : 18) Minimum reinforcement required in either direction in slabs reinforced with high strength deformed bars is:

A : 0.11

B : 0.12

C : 0.15

D : 0.17

Q : 19) In case of a non-cellular, non-ribbed flat slab, the spacing of the steel reinforcing bars shall not exceed m times the thickness of the slab, where in m is

A : 1.5

B : 1.2

C : 1.9

D : 2.0

Q : 20) Thickened part of a flat slab over the supporting column is called

A : Drop panel

B : Capital

C : Column head

D : All of the above

Q : 21) In RCC slabs spacing of shrinkage and temperature bars should not be more than :

A : Three times the effective depth of slab or 300 mm whichever

B : Four times the effective depth of the slab or 300 mm whichever is less

C : Five times the effective depth of the slab or 450 mm whichever is less

D : 450 mm

Q : 22) In a simply supported slab, alternate bars are curtailed at:

A : $\frac{\text{Span}}{5}$

B : $\frac{\text{Span}}{6}$

C : $\frac{\text{Span}}{7}$

D : $\frac{\text{Span}}{8}$

Q : 23) It is usual not to provide thickness of floor slabs in buildings less than

A : 7.5 cm

B : 10 cm

C : 12.5 cm

D : 15 cm

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Q : 24) In a two-way spanning slab, if corner of the slab are not lift, torsion reinforcement is provided at corners in the form of a mesh. The size of mesh should be equal to –

A : $0.125 \ell_x \times 0.125 \ell_y$

B : $0.125 \ell_x \times 0.25 \ell_y$

C : $0.25 \ell_x \times 0.125 \ell_y$

D : $0.25 \ell_x \times 0.20 \ell_y$

Q : 25) The main reinforcement in an RC slab consist of 10 mm bars 100 mm spacing centre to centre if it is desired to replace the 10 mm bars by 12 mm bars, then the spacing of the 12 mm bar will be

A : 100 mm

B : 120 mm

C : 144 mm

D : 240 mm

Q : 26) In an interior span of flat slab, the negative design moment is taken as _____ times the total design moment.

A : 0.35

B : 0.70

C : 0.65

D : 0.50

Q : 27) In a monolithic slab-beam RC constructions transverse reinforcement to be provided in the slab shall be :

A : 40% of main reinforcement at mid span

B : 25% of main reinforcement at mid span

C : 60% of main reinforcement at mid span

D : 50% of main reinforcement at mid span

Q : 28) In limit state method, the failure criterion for reinforced concrete beam and column is based on

A : Maximum principle stress theory

B : Maximum principle strain theory

C : Maximum shear stress theory

D : Maximum normal stress theory

Q : 29) Consider the following statements:

- 1. The minimum steel requirements of slab are based on considerations of shrinkage and temperature effects alone, and not on strength**
- 2. Providing excessive reinforcement in beams can result in congestion, thereby adversely affecting the proper placement and compaction of concrete**

Which of the above statements is/are correct?

A : 1 only

B : 2 only

C : Both 1 and 2

D : Neither 1 nor 2

Q : 30) According to IS 456, two-way slabs with corners held down are assumed to be divided in each direction into middle strips and edge strips such that the width of middle strip is,

A : half of the width of the slab

B : Two-third of the width of the slab

C : Three-fourth of the width of the slab

D : Four-fifth of the width of the slab

Q : 31) As per IS 456-2000, span to overall depth ratio for two-way simply supported slabs (with HYSD bars) satisfying vertical deflection limits is

A : 28

B : 32

C : 30

D : 35



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