

- Q26. A cycle load test is performed to determine a pile's
- (a) Skin resistance
- (b) Tip resistance
- (c) Ultimate load capacity under repetition
- (d) Skin resistance and tip resistance

Q27. A vane, 10.8 cm long, 7.2 cm in dia, was pressed into a soft clay at the bottom of a bore hole. Torque was applied and the value at failure was 45 Nm. Find the shear strength of the clay on a horizontal plane (a) $21 \text{ KN}/\text{m}^2$

- (b) $42 \text{ KN}/\text{m}^2$
- (c) $14 \text{ KN}/\text{m}^2$
- (d) $84 \text{ KN}/m^2$

Q28. The ratio of moment of inertia of inertia of a circular plate to that of a square plate for equal depth is

- (a) less than one
- (b) equal to one
- (c) greater than one
- (d) none of the above

Q29. In moment area method, the deflection of a point 'A' from a tangent at 'B' is equal to the

- (a) Area of $\frac{M}{FI}$ diagram between 'A' and 'B'
- (b) Moment of $\frac{M}{EI}$ diagram between 'A' and 'B' about point 'A' (c) Moment of $\frac{M}{EI}$ diagram between 'A' and 'B' about point 'B' (d) $\frac{1}{2} \times \text{area of } \frac{M}{EI}$ diagram between 'A' and 'B'
- Q30. Hot bitumen is used for damp-proofing course in the building. It can be applied with a minimum thickness of
- (a) 2 mm
- (b) 3 mm
- (c) 5 mm
- (d) 6 mm

Q31. The short-term modulus of elasticity of concrete (in N/mm²) as per IS 456 : 2000 is given by

- (a) $5000\sqrt{f_{cu}}$
- (b) $5700\sqrt{f_{cu}}$
- (c) $3000\sqrt{f_{cu}}$
- (d) $3700\sqrt{f_{cu}}$

Where f_{cu} is characteristic strength of concrete.

Q32. In limit state design of concrete structure, the stress distribution of concrete is assumed to be (a) Linear

(b) Rectangular

(c) Parabolic

(d) Parabolic and rectangular

Q33. The fixed support in an existing beam will change to ______ in the related conjugate beam.

- (a) Hinge support
- (b) Roller support
- (c) Free end
- (d) None of the above

Q34. The deterioration of the properties of a material when subjected to repeatedly applied stresses is termed as

(a) Creep

- (b) Fatigue
- (c) Isotropic
- (d) Elasticity

Q35. The maximum number of steps in a flight should NOT be more than

- (a) 12
- (b) 15
- (c) 10
- (d) 8

Q36. Consider the following methods of preservation of timber.

- 1. Dipping
- 2. Brushing or spraying
- 3. Pressure impregnation

The correct sequence in decreasing order of the effectiveness of these methods of preservation is

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

Q37. Lug angles are used to connect the members to

- (a) Reduce the length of connection
- (b) Increase the length of connection
- (c) Increase the strength of rivet connection
- (d) Reduce the strength of rivet connection

Q38. Initial load tests and routine tests are carried out on

- (a) Working piles and test piles respectively
- (b) Test piles and working piles respectively
- (c) Working piles
- (d) Test piles

Q39. Which one of the following parameters can be used as a rough guide to determine the type of failure in soil?

- (a) Angle of shearing resistance
- (b) Density index
- (c) Penetration test

(d) Plate load test

Q40. A bar of 4 cm diameter is subjected to an axial load of 4T. The extension of the bar over a gauge length of 20 cm is 0.03 cm. The decrease in diameter is 0.0018 cm. The Poisson's ratio is (a) 0.06

- (a) 0.06
- (b) 0.03
- (c) 0.33
- (d) 0.35

Q41. A course of stone provided just below a Cornice is known as

- (a) Frieze
- (b) Toothing
- (c) Pilaster
- (d) Carbell
- Q42. The process of compaction of a soil involves
- (a) Expulsion of pore water
- (b) Expulsion of pore air
- (c) Expulsion of both pore air and pore water
- (d) None of the above

Q43. The effective length of fillet weld should NOT be less than

- (a) Size of weld
- (b) Two times the size of weld
- (c) Three times the size of weld
- (d) Four times the size of weld

Q44. In Newmark's influence chart for stress distribution, there are eight concentric circles and ten radial lines. The influence factor of the chart is

- (a) 0.1
- (b) 0.01
- (c) 0.125
- (d) 0.0125

Q45. In a plate load test, the ultimate load is estimated from the load-settlement curve on a log-log graph

- (a) By drawing tangents to the curve at the initial and final points
- (b) Directly
- (c) By the secant method
- (d) Simply at 0.2% of the maximum settlement

Q46. The product E and I is known as

- (a) Polar moment
- (b) Flexural rigidity
- (c) Modulus of repture
- (d) Modulus of rigidity

Q47. The number of funicular polygons which can be drawn to pass through two specified points in the space diagram are

- (a) One
- (b) Two

- (c) Three
- (d) Infinity
- Q48. The strength of timber is maximum
- (a) Parallel to the grain
- (b) Perpendicular to the grain
- (c) 45° to the grain
- (d) Same in all direction

Q49. Weep holes are provided in retaining and breast walls

- (a) To drain off the water from the filling
- (b) To ventilate the stone masonry
- (c) To add architectural beauty
- (d) To increase compaction of the earth

Q50. Collapse load for the beam shown in fig. is



(d) 01.325

Q53. The strain energy stored in a simply supported beam of span 'l' and flexural rigidity 'EI' due to a central concentrated load 'w' is

(a) $\frac{w^2 l^3}{45EI}$ (b) $\frac{w^2 l^2}{45EI}$ (c) $\frac{w^2 l^3}{96EI}$ (d) $\frac{w^2 l^2}{96EI}$ Q54. Which one of the following is unstratified rock?

(a) quartz

(b) granite

(c) lime stone

(d) slate

Q55. As per IS : 456 : 2000, the chloride content for plain concrete should NOT be more than

- (a) 400 mg/L
- (b) 500 mg/L
- (c) 2000 mg/L
- (d) 3000 mg/L

Q56. The grain size (mm) of medium grained sand lies between

- (a) 0.425 to 0.075
- (b) 2.0 to 0.425
- (c) 4.75 to 2.0
- (d) 20 to 4.75

Q57. The toughness index of clayey soils is given by

- (a) Plasticity index/flow index
- (b) Liquid limit/plastic limit
- (c) Liquidity index/plastic limit
- (d) Plastic limit/liquidity index

8. The ratio of the deflection of the free end of a cantilever beam having span 'L', due to a concentrated
d 'W' at $\frac{1}{3}^{rd}$ and $\frac{2^{rd}}{3}$ span from free end of the span is
$\frac{3}{7}$
is constant
1.9 to 2.2

(b) 2.5 to 3.0

(c) 3.0 to 3.5

(d) 3.5 to 4.5

Q60. As per IS 456 : 2000, maximum water-cement ratio and minimum cement content for moderate exposure condition used in plain cement concrete are ______ respectively.

- (a) 0.6 and 220 kg/m³
- (b) 0.6 and 240 kg/m³
- (c) 0.5 and 250 kg/m³
- (d) 0.55 and 260 kg/m³

Q61. Maximum area of tension reinforcement in beam of size b \times D, shall NOT exceed (a) 0.04 bD

(b) 0.02 bD
(c) 0.08 bD
(d)01.10 bD
Where b is width and D is depth of beam.

Q62. In a saturated soil deposit having a density of 20 KN/m^3 , the effective normal stress on a horizontal plane at 5m depth will be

- (a) 20 KN/m² (b) 40 KN/m²
- (c) 50 KN/m^2
- $(d)100 \text{ KN/m}^2$

Q63. Pick the incorrect statement.

- (a) On a principal plane, only normal stress acts.
- (b) Isotropic state of stress is independent of frame of reference.
- (c) On the plane which carries maximum shear stress, the normal stress is zero.
- (d) On the plane which carries maximum normal stress, the shear stress is zero.

Q64. The slow setting cement will have higher percentage of

- (a) Tri calcium aluminate
- (b) Tri calcium silicate
- (c) Gypsum
- (d) Di-calcium silicate

Q65. Lifting of the corners of the slabs is prevented by providing ______ reinforcement. (a) torsion

- (a) torsio
- (b) shear(c) transverse
- (d) longitudinal
- (u) iongituuma

Q66. Moment of inertia of a square of side 'b' about an axis through its centre of gravity is (a) $b^3/3$

- (a) $b^{3}/3$ (b) $b^{4}/3$
- $(D) D^{4}/3$ (c) b4/12
- (c) $b^4/12$
- (d) b⁴/8
- Q67. Cavity wall is generally provided for
- 1. heat insulation
- 2. sound insulation
- 3. prevention of dampness of these statement
- (a) 1 and 2 are correct
- (b) 2 and 3 are correct
- (c) 1, 2 and 3 are correct
- (d) None of the above are correct

Q68. Which combination is NOT considered in the design of steel structure?

- (a) Dead load + Imposed load
- (b) Dead load + Imposed load + Wind load
- (c) Dead load + Erection load
- (d) Dead load + Imposed load + Wind load + Earthquake load

Q69. Coefficient of curvature (C_c) is given by

- (a) $C_c = \frac{(D_{30})^2}{D_{10} \times D_{20}}$ (b) $C_c = \frac{(D_{20})^2}{D_{10} \times D_{60}}$ (c) $C_c = \frac{(D_{30})^2}{D_{10} \times D_{40}}$
- (d) $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

Q70. The principle of virtual work can be applied to elastic system by considering the virtual work of

- (a) Internal forces only
- (b) External forces only
- (c) Internal as well as external forces
- (d) None of these

Q71. In limit state method, spacing of main reinforcement control primarily

- (a) durability
- (b) deflection
- (c) collapse
- (d) cracking

Q72. A three hinged parabolic arch will have no bending moment if it is hinged at ______ in addition to those at the supports.

- (a) One quarter of span
- (b) The crown
- (c) Anywhere
- (d) None of these

Q73. A PERT network has 9 activities on its critical path. The standard deviations of each activity on the critical path is 3. The standard deviation of the critical path is

- (a) 3
- (b) √3
- (c) $3\sqrt{3}$
- (d) 9
- Q74. The exit gradient for the seepage of water through a soil medium is given by
- (a) The slope of the flow lines
- (b) The slope of the equipotential lines
- (c) The ratio of total head to the height of seepage
- (d) The ratio of head loss to the height of seepage

Q75. Rankine-Gordon formula which covers all cases of struts, is

(a)
$$P = \frac{fcA}{1 + \left(\frac{a}{K}\right)^2 l}$$

(b)
$$P = \frac{fcA}{1 + a\left(\frac{l^2}{k^2}\right)}$$

(c) P =
$$\frac{1011}{k^2 + a^2 l^2}$$

(d)
$$P = \frac{fcA}{1 + \frac{a^2l}{k^2}}$$

where notation are as usual.

- Q76. Wide and deep cracks in concrete members may be repaired by
- (a) Grouting
- (b) Shotcreting or guniting
- (c) Mortar replacement
- (d) Epoxy injection

Q77. Which of the following condition is to be satisfied both in elastic and plastic analysis?

- (a) Equilibrium condition
- (b) Yield condition
- (c) Plastic moment condition
- (d) Mechanism condition

Q78. Percentage of steel for balanced section of a singly reinforced rectangular section by limit state method does NOT depend on

- (a) Characteristic strength of concrete
- (b) Yield strength of concrete
- (c) Modulus of elasticity of steel
- (d) Geometry of the section

Q79. Which test is to be conducted in the laboratory for the determination of shear strength parameters 'C' and ' ϕ ' soil?

- (a) Tri-axial compression test
- (b) Atterbarg limit test
- (c) Proctor compaction test
- (d) Relative density test

Q80. The Mullar Breslar principal in structural analysis is use<mark>d</mark> for

- (a) Writing virtual work equation
- (b) Superimposition of load effect
- (c) Drawing influence line diagram of any force function
- (d) None of the above

Q81. The minimum number of observation wells required to determine the permeability of a stratum in the field by a pumping test

- (a) One
- (b) Two
- (c) Three
- (d) None of the above

Q82. D' Alembert's principle is used for

- (a) Determining stresses is the truss
- (b) Reducing the problem of kinetics to equivalent static problem
- (c) Stability of floating bodies
- (d) Designing safe structures

Q83. The vertical sides of door and window opening are known as

- (a) Intrados
- (b) Tombs
- (c) Reveals
- (d) None of the above

Q84. A reinforced concrete beam having width of 250 mm and effective depth of 400 mm, is reinforced with 415 of steel grade (Fe 415). As per the provisions of IS : 456 : 2000, the minimum and maximum amount of tensile reinforcement for the section are respectively?

- (a) 250 mm² and 3500 mm²
- (b) 205 mm^2 and 4000 mm^2
- (c) 270 mm^2 and 2000 mm^2
- (d) 300 mm^2 and 2500 mm^2

Q85. Web crippling in beams generally occur at the point where

- (a) Concentrated loads acts
- (b) Bending moment is maximum
- (c) Shear force is maximum
- (d) Deflection is maximum

Q86. Which one of the following rollers is suitable for soil cement stabilized construction?

- (a) Vibratory roller
- (b) Sheep foot roller
- (c) Pneumatic roller
- (d) Smooth wheel roller

Q87. The coefficient of consolidation is determined by

- (a) Penetrometer method
- (b) Casagrand's apparatus
- (c) Square root of time fitting method
- (d) Differentiation method

Q88. A particle moves in a straight line. Its position is defined by the equation $x = 6t^2 - t^3$ where t in seconds and x is in meters. The maximum velocity of the particle during its motion will be (a) 12 m/s

- (b) 6 m/s
- $(D) \circ III/S$
- (c) 24 m/s
- (d) 48 m/s
- Q89. The change in shearing force between two points on the beam is equal to the area of
- (a) Loading diagram between two points
- (b) Shear force diagram between two points
- (c) Bending moment diagram between two points
- (d) $\frac{M}{ET}$ diagram between two points

Q90. If 'P' is the percentage of water required for determination of normal consistency of cement, then percentage of water to be added for determination of initial setting time is

- (a) 0.70 P
- (b) 0.75 P
- (c) 0.80 P

(d) 0.85 P

Q91. The maximum percentage of ingradient in cement is that of

(a) Lime

(b) Iron oxide

(c) Aluminium

(d) Silica

Q92. A column of unsupported length L has both the ends fully restrained. The effective length of column will be

(a) 0.55 L

(b) 0.65 L

(c) 0.80 L

(d) 2.0 L

Q93. The flexural tensile strength of concret<mark>e can be given as p</mark>er IS : 456 : 2000

- (a) $0.45/\sqrt{f_{cu}}$
- (b) $0.7/\sqrt{f_{cu}}$

(c) $0.7 \times \sqrt{f_{cu}}$

(d) $0.45 \times \sqrt{f_{cu}}$

Q94. The group efficiency of a pile group

(a) will be always less than 100%

(b) will be always greater than 100%

(c) may be less than 100% or more than 100% depending upon other factors

(d) is more than 100% in cohesionless soil and less than 100% in cohesive soil

Q95. What is the virtual quantity in case of virtual work method?

(a) Slope

(b) Load

(c) Displacement

(d) Moment

Q96. In airconditional building, the glass recommended for use, is

(a) Plate glass

(b) Wired glass

- (c) Foam glass
- (d) Glass wool

Q97. Which of the following is the most correct method of estimate?

- (a) Building cost index estimate
- (b) Analysis of rate estimate
- (c) Cube rate estimate
- (d) Plinth area estimate

Q98. The maximum value of slenderness ratio of compression number carrying loads resulting from dead load and superimposed load is

(a) 150

(b) 180

(c) 200 (d) 250

Q99. The side face reinforcement in the deep beam shall NOT be less than

(a) $0.1 \times \text{web}$ area

(b) $0.01 \times \text{web}$ area

(c) $0.001 \times \text{web}$ area

(d) $0.012 \times \text{web}$ area

Q100. In a compaction test, as the compactive effort is increased the optimum moisture content

(a) decreases

- (b) remain same
- (c) increases
- (d) increase first and thereafter decrease

Q101. If the resultant of two equal forces has the same magnitude as either of the forces, then the angle between the two forces is

(a) 30°

(b) 60°

(c) 90°

(d) 120°

Q102. A cantilever beam of rectangular cross-section is subjected to a concentrated load 'w' at its free end. If the width of the beam is doubled, the deflection at the free end as compared to earlier case, will be (a) 8 times

(b) 4 times

- (c) 2 times
- (d) half

Q103. Which of the following is NOT a drier in paints? (a) Leatharge (b) Lead oxide (c) Red lead (d) Copper sulphate Q104. With the usual notation, sinking fund factor is given by (a) $(1 + i)^n$ (b) $i/[(1+i)^n - 1]$ (c) $\frac{1}{(1+i)^n}$ (d) $\frac{(1+i)^n}{[(1+i)^n-1]}$

Q105. A singly reinforced rectangular concrete beam of width 300 mm and effective depth 400 mm, is to be designed using M 25 grade concrete and Fe 500 grade steel. For the beam to be under reinforced, the maximum number of 16 mm diameter reinforcing bars that can be provided

(a) 3

(b) 4

(c) 5

(d) 6

Q106. In an isolated reinforced concrete column footing of effective depth d, the stress in punching shear is checked

- (a) At the centre of column
- (b) At the face of column
- (c) At a distance d/2 away from face of the column
- (d) At a distance d away from face of the column

Q107. As per Indian standard soil classification system, a sample of silty clay with liquid limit of 40% and plasticity Index of 28% is classified as

(a) CH

(b) CI

(c) CL

(d) CL-ML

Q108. Which one of the method is NOT classified as force method?

- (a) The theorem of three moments
- (b) The moment distribution method
- (c) The method of consistent deformation
- (d) Castigliano's theorem

Q109. A critical activity has

- (a) Minimum float
- (b) Zero float
- (c) Maximum float
- (d) None of the above

Q110. Which of the following pairs is NOT matched correctly with regards to coarse aggregate 10 mm size?

- (a) Strength
- (b) Toughness
- (c) Hardness
- 10 percent fine Impact test Abrasion test
- (d) Specific gravity Pyconometer

Q111. Reinforcement provided in a rectangular RCC beam of effective depth 500 mm is such that actual depth of neutral axis is at 300 mm from extreme compression fibre Fe 415 steel is used and provided on tension face only. It is a

- (a) Doubly reinforced section
- (b) Under reinforced section
- (c) Over reinforced section
- (d) Balanced section
- Q112. Sensitivity of a clay can be defined as
- (a) percentage of volume change of soil under saturated condition
- (b) ratio of unconfined compressive strength of undistructed soil to that of soil in a remoulded state
- (c) ratio of volume of voids to volume of solids
- (d) none of the above

Q113. During seepage through an earth mass, the direction of seepage is

- (a) Parallel to the equipotential lines
- (b) Perpendicular to the stream lines

- (c) Perpendicular to the equipotential lines
- (d) Along the direction of gravity

Q114. When two0 concurrent forces 20 kg and 15 kg act at right angles on a particle, then their resultant will be equal to

- (a) 35 kg
- (b) 25 kg
- (c) 5 kg
- (d) $20\sqrt{15}$ kg

Q115. Defects such as blisters and cracks in bitumen may be caused by natural agencies such as

- 1. Water
- 2. Air
- 3. Light
- Of the above, the correct agency (ies) is/are
- (a) 1 alone
- (b) 1 and 2
- (c) 1 and 3
- (d) 1, 2 and 3

Q116. Horizontal web stiffener are used in plate girders if depth to thickness ratio of web is greater than

- (a) 100
- (b) 180
- (c) 200
- (d) 300

Q117. The constant of proportionality between seepage velocity and hydraulic gradient is called

- (a) Seepage coefficient
- (b) Coefficient of transmissibility
- (c) Coefficient of percolation
- (d) Modified coefficient of permeability

Q118. If forces of 1N, 2N, 3N, 4N, 5N and 6N act in order along the sides of a regular hexagon, their resultant is

- (a) 0
- (b) 6N
- (c) 12N
- (d) 21N

Q119. For centring of R.C.C. structures the bricks used should be

- (a) 1st Class
- (b) 2nd Class
- (c) 3rd Class
- (d) 4th Class

Q120. In design of steel structure, the design wind speed in 45 m/sec, the basic wind pressure to be considered will be (a) 27.0 N/m^2 (b) 29.25 N/m^2 (c) 1.215 N/m^2 (d) 1.316 N/m²

Q121. For a base failure, the Depth Factor D_f is

(a) Zero

(b) 1

(c) $0 < D_f < 1$

(d) $D_f > 1$

Q122. A borrow soil has a dry density of 1.76 t/m³. How many cubic meters of this soil will be required to construct an embankment (with dry density 1.68 t/m³) of 100 m³?

(a) 95 m³

(b) 100 m³

(c) 105 m³

(d) 110 m³

Q123. The minimum thickness of the wall where single Flemish bond is used

(a) One brick thick

(b) One and a half brick thick

(c) Two and a half brick thick

(d) None of the above

Q124. Consider the following oxides.

 $1.\,Al_2O_3$

2. CaO

3. SiO₂

The correct sequence in increasing order of their percentage in an ordinary Portland cement is (a) 1, 3, 2

(a) 1, 3, 2 (b) 2, 1, 3

(c) 3, 1, 2

(d) 1, 2, 3

Q125. For a single point load 'W' moving on a symmetrical parabolic three hinged arch of span 'L', the maximum sagging moment occurs at a distance 'x' fromd ends. The value of x is

(a) 0.211 L (b) 0.250 L

(c) 0.234 L (d) 0.50 L ENGINEERS

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S26. Ans.(d) S27. Ans.(b) S28. Ans.(a) S29. Ans.(b) S30. Ans.(b) S31. Ans.(a) S32. Ans.(d) S33. Ans.(c) S34. Ans.(b) S35. Ans.(a) S36. Ans.(c) S37. Ans.(a) S38. Ans.(b) S39. Ans.(a) S40. Ans.(No option is correct) S41. Ans.(a) S42. Ans.(b) S43. Ans.(b) S44. Ans.(d) S45. Ans.(b) S46. Ans.(b) S47. Ans.(d) S48. Ans.(a) S49. Ans.(a) S50. Ans.(c) S51. Ans.(c) S52. Ans.(b) S53. Ans.(c) S54. Ans.(b) S55. Ans.(c) S56. Ans.(b) S57. Ans.(a) S58. Ans.(d) S59. Ans.(b) S60. Ans.(b) S61. Ans.(a) S62. Ans.(c) S63. Ans.(c) S64. Ans.(d) S65. Ans.(a) S66. Ans.(c) S67. Ans.(c) S68. Ans.(d) S69. Ans.(d) S70. Ans.(c) S71. Ans.(c) S72. Ans.(d) S73. Ans.(d)

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S74. Ans.(d) S75. Ans.(b) S76. Ans.(a) S77. Ans.(a) S78. Ans.(b) S79. Ans.(a) S80. Ans.(c) S81. Ans.(b) S82. Ans.(b) S83. Ans.(d) S84. Ans.(b) S85. Ans.(a) S86. Ans.(d) S87. Ans.(c) S88. Ans.(a) S89. Ans.(a) S90. Ans.(d) S91. Ans.(a) S92. Ans.(b) S93. Ans.(c) S94. Ans.(d) S95. Ans.(c) S96. Ans.(c) S97. Ans.(c) S98. Ans.(b) S99. Ans.(c) S100. Ans.(a) S101. Ans.(d) S102. Ans.(d) S103. Ans.(d) S104. Ans.(b) S105. Ans.(c) S106. Ans.(c) S107. Ans.(b) S108. Ans.(b) S109. Ans.(b) S110. Ans.(a) S111. Ans.(c) S112. Ans.(b) S113. Ans.(c) S114. Ans.(b) S115. Ans.(d) S116. Ans.(c) S117. Ans.(c) S118. Ans.(b) S119. Ans.(b) S120. Ans.(c) S121. Ans.(d) S122. Ans.(a) S123. Ans.(b)

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S124. Ans.(a) S125. Ans.(a)

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