



UPPSC AE

Civil Engineering

Mega Mock Challenge

(January 6th - January 7th 2022)

Questions &
Solutions

1. 'बोरौ सवै रघुवंश कुठार की धार में बारन बाजि सरत्थहि।
बान की वायु उड़ाइ कै लच्छन लक्ष्य करौ अरिहा समरत्थहिं।
रामहिं बाम समेत पठै बन कोप के भार में भूजौ भरत्थहिं।
जो धनु हाथ धरै रघुनाथ तो आजु अनाथ करौ दसरत्थहि'।
इस पद्य में कौन-सा रस है?

- A. शान्त रस
B. वीर रस
C. रौद्र रस
D. करुण रस

Ans. C

2. 'चरण कमल बंदौ रघुराई' में कौन सा अलंकार है?
A. श्लेष अलंकार
B. रूपक अलंकार
C. अनुप्रास अलंकार
D. यमक अलंकार

Ans. B

3. शोकग्रस्त में समास है।
A. कर्मधारय तत्पुरुष समास
B. संप्रदान तत्पुरुष समास
C. संबंध तत्पुरुष समास
D. करण तत्पुरुष समास

Ans. D

4. निम्नलिखित पर्यायवाची शब्दों में से 'मछली' का पर्यायवाची नहीं है, उसे चयनित कीजिये-
A. मीन
B. सफरी
C. निलय
D. झष

Ans. C

5. 'परिसीमन' का विलोम है।
A. ससीम
B. निरसीमन
C. असीम
D. ससीमन

Ans. B

6. 'कर्पट' का तदभव रूप कौनसा है?
A. कपट
B. कारपोट
C. कपूर
D. कपड़ा

Ans. D

7. क्षणिक एवं तीव्र आनंद। वाक्य के लिए एक शब्द होगा-
A. आनंद
B. आह्लाद
C. उल्लास
D. प्रसन्नता

Ans. B

8. 'आये थे हरि भजन को ओटन लगे कपास' – मुहावरे का अर्थ क्या है?
- A. उद्देश्य की प्राप्ति में असफल होना
B. ईश्वर भक्ति को छोड़कर व्यापार में लग जाना
C. हरि भक्ति का मार्ग कठिन होता है
D. किसी कार्य विशेष की उपेक्षा कर दूसरे कार्य को करना

Ans. D

9. निम्नलिखित शब्द में से शुद्ध वर्तनी वाले शब्द का चयन कीजिए।

- A. प्रसंशा
B. जिच्हा
C. जुखाम
D. यथेष्ट

Ans. D

10. अशुद्ध वाक्य का चयन करें-

- A. माता-पिता का आदर करना चाहिए।
B. घी बहुत अच्छा नहीं है।
C. वह कक्षा का सर्वश्रेष्ठ छात्र है।
D. पाप बढ़ती है तो वर्षा नहीं होता।

Ans. D

11. निम्न में से 'भ्वादि' शब्द में संधि है?

- A. स्वर संधि
B. व्यंजन संधि
C. विसर्ग संधि
D. यण संधि

Ans. D

12. निम्न में स्त्रीलिंग शब्द है -

- A. पानी
B. रवि
C. कवि
D. तिथि

Ans. D

13. निम्न में से कौन-सा वचन का जोड़ा सही है -

- A. डिबिया - डिबियें
B. सुधि - सुधिजन
C. पाठक - पाठकजन
D. कली - कलियों

Ans. B

14. 'पेड़ से बन्दर कूदा' वाक्य में कौन-सा कारक है?

- A. अपादान कारक
B. कर्म कारक
C. सम्प्रदान कारक
D. करण कारक

Ans. A

15. पुष्कर का अनेकार्थी शब्द है।

- A. मेवा
B. नतीजा
C. कमल
D. पेड़ का फल
E. तलवार

Ans. C

16. निम्न में से 'मतैक्य' शब्द में संधि है?

- A. यण संधि
B. अयादि संधि
C. गुण संधि
D. वृद्धि संधि

Ans. D

17. जन रंजन मंजन दनुज मनुज रूप सुर भूप।

विश्व बदर इव धृत उदर जोवत सोवत सूप।।

इस पद में कौनसा अलंकार है?

- A. यमक
B. श्लेष
C. अनुप्रास
D. इनमें से कोई नहीं।

Ans. C

18. 'दोराहा' में कौन-सा समास है?

- A. द्वंद्व
B. अव्ययीभाव
C. द्विगु
D. तत्पुरुष

Ans. C

19. 'धूसर' शब्द का पर्याय है।

- A. अश्व
B. मेघ
C. गर्दभ
D. अजा

Ans. C

20. दिए गए शब्द का विलोम चुनें।

नूतन

- A. निर्माण
B. पुरातन
C. दूर
D. धीर

Ans. B

21. निम्न में से तत्सम और तद्भव शब्दों का कौन-सा मेल गलत है?

- A. भ्रमर - भौरा
B. भ्रात - भाई
C. भिक्षा - भीख
D. वारिद - पानी

Ans. D

22. **निर्देश:** नीचे कुछ वाक्यांश या शब्द दिए गये हैं और उसके बाद चार शब्द दिए गये हैं जो एक ही शब्द में इस वाक्यांश या शब्द-समूह का अर्थ प्रकट करता है। आपको यह पता लगाना है कि वह शब्द कौन सा है जो वाक्यांश या शब्द समूह का सही अर्थ प्रकट करता है। उस विकल्प का क्रमांक ही आपका उत्तर है। यदि कोई शब्द अर्थ नहीं प्रकट करता है तो उत्तर (5) अर्थात् इनमें से कोई उत्तर नहीं है।

जिसका जन्म कन्या के गर्भ से हुआ हो

- A. कन्यापुत्र
B. अवैधपूर्ण
C. कानीन
D. कुमारीपुत्र
E. इनमें से कोई नहीं

Ans. C

23. 'आँख का अंधा नाम नयनसुख' – लोकोक्ति का क्या अर्थ है?

- A. आँख की रोशनी जाना
B. नामकरण करना
C. गुण के विरुद्ध नाम का होना
D. संतुष्ट होना

Ans. C

24. निर्देश: वर्तनी के अनुसार शुद्ध शब्द का चयन कीजिए:

- A. अलोकित
B. अलौकिक
C. अलोकिक
D. आलौकिक

Ans. B

25. निर्देश:- दिए गए वाक्य का वह भाग ज्ञात करें जिसमें कोई त्रुटि है।

शिक्षक से व्यक्ति के भविष्य को बनाया जाता है।

- A. व्यक्ति के
B. बनाया जाता है
C. शिक्षक से
D. भविष्य को

Ans. C

26. A block of weight 20 kN just begins to move along a horizontal surface on application of 5 kN horizontal force. The coefficient of friction between block and surface is:

- A. 0.10
B. 0.20
C. 0.25
D. 0.50

Ans. C

27. The natural frequency of a system increases with

- A. an increase in the stiffness of the system
B. a decrease in the mass of the system
C. both increase in the stiffness of the system and decrease in the mass of the system
D. neither increase in the stiffness of the system nor decrease in the mass of the system

Ans. C

28. Which one of the following is representing well condition triangle?

- A. $25^\circ, 85^\circ, 110^\circ$
B. $35^\circ, 85^\circ, 110^\circ$
C. $35^\circ, 85^\circ, 130^\circ$
D. $35^\circ, 95^\circ, 140^\circ$

Ans. B

29. The centre of gravity of a quadrant of a circle lies along its central radius at a distance of

- A. 0.3 R
B. 0.44 R
C. 0.5 R
D. 0.6 R

Ans. B

36. A prismatic beam simply supported carries a concentrated load W at mid-span. If the same beam is fixed at its ends, what load at mid-span can produce the same deflection at mid-span?
- A. $4 W$ B. $2 W$
C. $3 W$ D. $5 W$

Ans. A

37. When a shaft is subjected to torsion, the relation between maximum shear stress (τ), modulus of rigidity I and angle of twist (θ) is given by
Where, L -length shaft, R -radius of shaft
- A. $\frac{C\theta}{\tau} = \frac{R}{L}$ B. $\frac{C\theta}{L} = \frac{\tau}{R}$
C. $\frac{C\theta}{R} = \frac{\tau}{L}$ D. $\frac{C}{L\theta} = \frac{\tau}{R}$

Ans. B

38. Which one of the following method is convenient for determining deflection of beam of non uniform flexural rigidity?
- A. Macaulay's method B. Conjugate beam method
C. Moment area method D. Double integration method

Ans. B

39. The greatest eccentricity which a load w can have without tension on the cross-section of a short column of external diameter D and internal diameter d , is
- A. $\frac{D^2 + d^2}{8D}$ B. $\frac{D^2 - d^2}{8D}$
C. $\frac{\pi(D^2 + d^2)}{8D}$ D. $\frac{D^2 + d^2}{8\pi D}$

Ans. A

40. In the conjugate beam method, the fixed support in actual beam is considered as _____ support in the conjugate beam.
- A. Free B. Hinge
C. Fixed D. Roller

Ans. A

41. Volumetric strain is defined as which of the following?
- A. $\frac{\delta V}{V}$ B. $\frac{V}{\delta V}$
C. $\frac{m}{\delta V}$ D. $\frac{\delta V}{m}$

Ans. A

42. Maximum deflection for a cantilever of length L , carrying a load of W at its free end is
- A. $\frac{WL^3}{2EI}$ B. $\frac{WL^3}{4EI}$
C. $\frac{WL^3}{3EI}$ D. $\frac{WL^3}{5EI}$

Ans. C

43. If the temperature of a rod of length L is increased by $T^\circ\text{C}$, whose coefficient of linear expansion is α and Young's modulus is E , then free expansion of the rod due to increase in temperature is given by which of the following expressions?

- A. $\alpha TE^2 L$
- B. $\frac{\alpha T}{L}$
- C. $\frac{\alpha T}{E}$
- D. None of the above

Ans. D

44. The work done in producing strain on a material per unit volume is called:

- A. Resilience
- B. Plasticity
- C. Elasticity
- D. Ductility

Ans. A

45. The ratio of modulus of rigidity to modulus of elasticity for a Poisson's ratio of 0.25 would be:

- A. 0.4
- B. 0.5
- C. 0.2
- D. 0.1

Ans. A

46. Maximum deflection at the mid-span of a simply-supported beam of span l , with uniformly distributed load (w) all over the beam span, and flexural rigidity EI , is (modulus of elasticity = E ; moment of inertia of beam = I)

- A. $\frac{5wl^4}{48EI}$
- B. $\frac{5wl^4}{384EI}$
- C. $\frac{wl^3}{48EI}$
- D. $\frac{wl^3}{3EI}$

Ans. B

47. Maximum deflection of a cantilever due to pure moment 'M' at its free end, is:

- A. $\frac{ML^2}{3EI}$
- B. $\frac{ML^2}{4EI}$
- C. $\frac{ML^2}{2EI}$
- D. $\frac{ML^2}{6EI}$

Ans. C

48. A given determinate truss is loaded with gravity loads. Under these loads different nodes undergo deflection horizontally and vertically. Thereafter the truss is subjected to a temperature drop of 50°C in the lower chord only. The coefficient of expansion or contraction $\alpha = 11.7 \times 10^{-6}/^\circ\text{C}$. Which of the following statements is true?

- A. Vertical and horizontal deflection along lower chord nodes remains the same.
- B. Vertical and horizontal deflections along lower chord nodes shall change.
- C. Horizontal deflection along lower chord nodes shall change but vertical deflection shall not change.
- D. None of the above

Ans. B

49. Substitute frame method is used to analyse the building frame if the frame is subjected to _____.

- A. Lateral loads due to wind
- B. Lateral loads due to earthquake
- C. Vertical live load only
- D. Vertical dead load and live loads

Ans. D

50. Which of the following is an incorrect assumption in the analysis of truss?

- A. All joints are pinned
- B. Loads applied at joints only
- C. All members are straight
- D. Weights of members are acting at their centres

Ans. D

51. Match the List-I with List-II and select your correct answer using the codes given below:

List-I (Name of the associated with the methods)

- a. G.N. Maney
- b. Hardy cross
- c. Euler
- d. Clapeyron

List-II (Method)

- 1) Moment distribution
 - 2) Slope deflection method
 - 3) Theorem of three moments
 - 4) Crippling load on column
- A. a-2 b-1 c-4 d-3
 - B. a-1 b-2 c-3 d-4
 - C. a-1 b-2 c-4 d-3
 - D. a-2 b-1 c-3 d-4

Ans. A

52. Three prismatic members AB, BC and BD meet at a joint for a rigid frame to be analyzed using moment distribution method. The distribution factors for members AB and BC are 0.5 and 0.3 respectively. The distribution factor for member BD shall be:

- A. 0.2
- B. 1.67
- C. 0.6
- D. 0.15

Ans. A

53. A continuous beam ABC is simply supported at supports A, B and C . Portion AB has span of 6 m and BC 4 m. Portion AB is loaded with a concentrated load of 120 kN downward at 3m from A . The qualitative reactions shall be

- A. Reactions at A and B shall be upward and reaction at C shall be zero
- B. Reactions at A and B shall be upward
- C. All reactions i.e., at A, B and C shall be upwards
- D. None of the above

Ans. B

54. What is the allowable direct tensile stress in structural steel ? (where f_y = proof stress or yield stress)

- A. $0.6 f_y$
- B. $0.66 f_y$
- C. $0.45 f_y$
- D. $0.8 f_y$

Ans. A

55. As per the Indian Standard (IS) 800:2007, a maximum effective slenderness ratio for member carrying compressive loads resulting from dead loads and imposed loads.
- A. 250
B. 300
C. 180
D. 350

Ans. C

56. A compression member having gross and effective cross-sectional areas of 1500 mm² and 1250 mm², respectively. If the design compressive stress is 150 MPa, the design compressive strength of the column will be
- A. 8.33 kN
B. 10 kN
C. 188 kN
D. 225 kN

Ans. D

57. Wind load on steel roof truss for an industrial building will depend on
- A. Location of the structure
B. Height of the structure
C. Shape of the structure
D. All of these

Ans. D

58. A bolt is subjected to a shear stress of f_{sb} and a tensile stress of f_{tb} . If the permissible stresses in shear and tension are f_{asb} and f_{atb} respectively then the stress should satisfy:

A. $\frac{f_{sb}}{f_{asb}} + \frac{f_{tb}}{f_{atb}} \leq 1.0$

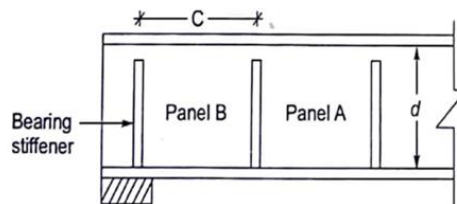
B. $\left(\frac{f_{sb}}{f_{asb}}\right)^{1.4} + \left(\frac{f_{tb}}{f_{atb}}\right)^{1.4} \leq 1.0$

C. $\frac{f_{sb}}{f_{asb}} + \frac{f_{tb}}{f_{atb}} \leq 1.4$

D. $\left(\frac{f_{sb}}{f_{asb}}\right)^2 + \left(\frac{f_{tb}}{f_{atb}}\right)^2 \leq 1.0$

Ans. D

59. For plate girder shown in figure below by using what action is Panel A designed?



- A. Simple post critical action
B. Tension field action
C. Bearing force action
D. None of the above

Ans. B

60. For economical spacing of roof truss, if t, p and r are the costs of truss, purlin and roof covering respectively then:

- A. $t=p+r$
B. $t=2p+r$
C. $t=p+3r$
D. $t=p+2r$

Ans. B

61. The minimum thickness of a base palte, t_s in case of slab base can be calculated by the formula

A. $t_s = \sqrt{2.5w(b^2 - 0.3a^2)f_y l \gamma m_o}$

B. $t_s = \sqrt{[2.5w(b^2 - 0.3b^2)y_{mo} / f_y]}$

C. $t_s = \sqrt{[2.5w(a^2 - 0.3b^2)y_{mo} / f_y]}$

D. $t_s = \sqrt{2.5w(a^2 - 0.3b^2)f_y l y_{mo}}$

Ans. C

62. The diameter of bolt hole for a bolt of nominal size 12 mm is:
- A. 12.0 mm
 - B. 12.5 mm
 - C. 13.0 mm
 - D. 14.0 mm

Ans. C

63. The angle of dispersion of a concentrated load on the flange to the web plate of a steel beam is
- A. 70 Degrees with horizontal
 - B. 60 Degrees with vertical
 - C. 45 Degrees with vertical
 - D. 30 Degrees with vertical

Ans. B

64. As per IS-875, where access is not provided except for maintenance, live load on roofs, while designing a truss, in respect of its plan area is adopted as
- A. 100 N/sq.m
 - B. 400 N/sq.m
 - C. 750 N/sq.m
 - D. 1500 N/sq.m

Ans. C

65. The minimum thickness of web plate from corrosion point of view should be
- A. 12 mm
 - B. 6 mm
 - C. 3 mm
 - D. 20 mm

Ans. B

66. Gauge of bolt is the distance between two consecutive bolts in
- A. the direction perpendicular to the direction of load/stress
 - B. the direction of load/stress
 - C. the direction at 45 to the line of action of force
 - D. an inclined direction

Ans. A

67. A rectangular beam section of 300 mm width and 500 mm effective depth has tensile reinforcement of 1346 mm². The beam M is constructed using M20 grade concrete and Fe 415 steel. Calculate the depth of neutral axis.
- A. 225 mm
 - B. 222 mm
 - C. 135 mm
 - D. 240 mm

Ans. A

68. The permissible stress in steel (σ_{st}) is 130 MPa in a water tank of diameter 1.3 m which is designed to resist direct tensile force (T) of 260 kN per meter width. Determine the required area of tension steel in mm²/m.
- A. 500
 - B. 2000
 - C. 33800
 - D. 2×10^9

Ans. B

69. Determine the volume of a 5m diameter bunker to store 50 tonnes of coal having density of 10 kN/m³
- A. 5 m³
 - B. 20 m³
 - C. 50 m³
 - D. 500 m³

Ans. C

70. As per the Indian Standard (IS) 3370 : 2009, the minimum grade of concrete to be used in liquid retaining structures should be
- A. M20
C. M30
B. M25
D. M15

Ans. C

71. A rigid frame detailed to provide good ductility and support for both lateral and gravity loads by flexural action is called:
- A. Ordinary moment resisting frame
C. Special moment resisting frame
B. Intermediate moment resisting frame
D. All of the above

Ans. D

72. Dead weight of waist slab of a stair case spanning longitudinally is calculated as:

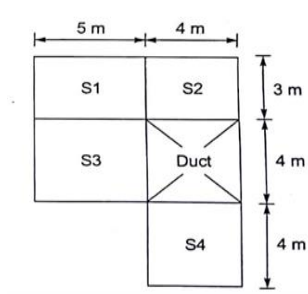
A. $25D\sqrt{1+\left(\frac{R}{T}\right)^2}$
 B. $25d\sqrt{1+\left(\frac{R}{T}\right)^2}$
 C. $25D\sqrt{1+\left(\frac{T}{R}\right)^2}$
 D. $25d\sqrt{1+\left(\frac{T}{R}\right)^2}$

Ans. A

73. In singly reinforced sections, when the section is under-reinforced, the relation between depth of neutral axis (x_u) and the limiting value of depth of neutral axis ($x_{u, \max}$) is:
- A. $x_u = x_{u, \max}$
 B. $x_u < x_{u, \max}$
 C. $x_u > x_{u, \max}$
 D. None of the above

Ans. B

74. Match the end conditions for restrained slab panels:



- (a) S1 I. Four edges continuous
 (b) S2 II. One long edge continuous
 (c) S3 III. Two adjacent edges discontinuous
 (d) S4 IV. Four edges discontinuous
 V. One short edge continuous

Select the correct response

- a b c d
 A. IV II V I
 C. III V II IV
 a b c d
 B. II V I IV
 D. III IV II V

Ans. C

75. Minimum reinforcement required in either direction in slabs reinforce with high strength deformed bars is :

- A. 0.11
- B. 0.12
- C. 0.15
- D. 0.17

Ans. B

76. A Pigeaud's coefficient method for the analysis of an interior panel of a T-beam bridge

- A. Notation for coefficient as $a_y/4$ includes suffix 4 since panel is continues on all the 4 edges
- B. Poisson's ratio of concrete has no contribution
- C. Applicability is restricted, to the case when wheel load is centrally placed
- D. Dispersion of load is considered through wearing coat only

Ans. C

77. Pedestal columns are

- A. Very short columns with effective length less than three times least lateral dimension
- B. Very long columns with effective length more than four times least lateral dimensions
- C. Very short Columns with effective length more than three times least lateral dimension,
- D. Very short columns with effective length more than the least lateral dimensions.

Ans. A

78. Drops are provided in flat slab to resist

- A. Bending moment
- B. Thrust
- C. Shear
- D. Torsion

Ans. C

79. In a beam M20 Grade of concrete and fe415 HYSD deformed bars has development length 500 mm, if 20 mm diameter bars are used as main reinforcement, then the length of lap of reinforcement bars in tension is

- A. 600 mm
- B. 500 mm
- C. 480 mm
- D. 400 mm

Ans. A

80. Design of foundation for a large generator is guided, primarily, by

- A. Frequency
- B. Deformation
- C. Strength
- D. Stiffness

Ans. A

81. In the design of Isolated column footing of thickness d the critical section from the consideration of single shear is

- A. at column facet
- B. at distance $d/4$ from the column face.
- C. at distance from the face of column.
- D. at distance d from the face of column.

Ans. D

82. A per the stress block defined in IS 456-2000, the limiting depth of neutral axis in a flexural member having effective depth ' d ' reinforced with Fe 550 grade steel in tension side is

- A. 0.48 d
- B. 0.53 d
- C. 0.42 d
- D. 0.44 d

Ans. D

83. In foundations rested on hard rock, minimum diameter of bar to be used for doweling is:
A. 16 mm
B. 20 mm
C. 25 mm
D. 32 mm
- Ans. A
84. Maximum spacing of shear stirrups should not exceed lesser of (where d = effective depth)
A. $0.75 d$ or 300 mm
B. $0.75 d$ only
C. 300 mm only
D. 450 mm
- Ans. A
85. Maximum depth of neutral axis for singly reinforced beam with Fe500 is (here, depth of the beam = d)
A. $0.44 d$
B. $0.46 d$
C. $0.48 d$
D. $0.53 d$
- Ans. B
86. The capacity of a "28 S type" concrete mixer is 0.8 m^3 . For mixing one cubic metre of concrete, the quantity of cement required is 5.5 bags. In order to avoid fractional usage of cement bags, the volume of concrete (m^3) to be mixed per batch will be
A. 0.78
B. 0.49
C. 0.73
D. 0.44
- Ans. C
87. Identify which grade of cement is not available in Indian market.
A. 33 grade
B. 23 grade
C. 43 grade
D. 53 grade
- Ans. B
88. Rock formed by the process of gradual deposition are known as
A. igneous rocks
B. volcanic rocks
C. sedimentary rocks
D. metamorphic rocks
- Ans. C
89. Excess of silica makes brick
A. to melt on burning
B. to crack on drying
C. to warp
D. brittle on burning
- Ans. D
90. The reason for adding gypsum in cement is:
A. To increase the rate of hydration
B. To avoid flash set
C. To decrease the soundness of cement
D. To increase the head of hydration
- Ans. B
91. Assertion (A) : Use of cement lime mortar is generally preferred to cement mortar.
Reason (R) : Cement-lime mortar has higher workability and water retentivity characteristics than cement mortar.
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.
- Ans. A

92. King Closers are related to
- A. door and windows
 - B. king post truss
 - C. queen post truss
 - D. brick masonry

Ans. D

93. Blast furnace slag has approximately
- A. 45% calcium oxide and about 35% silica
 - B. 50% alumina and 20% calcium oxide
 - C. 25% magnesia and 15% silica
 - D. Calcium sulphate and 15% alumina

Ans. A

94. Ribs are made on steel wires to increase
- A. strength in compression
 - B. strength in tension
 - C. bond strength
 - D. fatigue quality

Ans. C

95. Add it ion of Pozzolana to Portland cement causes
- A. increase in heat of hydration.
 - B. increase in early strength.
 - C. increase in water tightness.
 - D. All the above

Ans. C

96. Enamel paint is prepared by adding white lead or zinc to
- A. Varnish
 - B. Polyesterene
 - C. Spirit
 - D. None of these

Ans. A

97. Polymerization is the process of
- A. combine monomers to form a large chain-like molecule.
 - B. combine monomers to form a small chain-like molecule.
 - C. break a polymer into a number of small monomers.
 - D. break a polymer to form into a number of long monomers.

Ans. A

98. Syenite is
- A. Plutonic rock
 - B. Hypabyssal rock
 - C. Volcanic igneous rock
 - D. None of these

Ans. A

99. How much in the covering capacity of cement paint?
- A. About 18 m²/kg per coat
 - B. About 20 m²/kg per coat
 - C. About 12 m²/kg per coat
 - D. About 4 m²/kg per coat

Ans. D

100. To what, is Ease related in concrete technology?
- A. Geology of fresh concrete
 - B. Rheology of fresh concrete
 - C. Mineralogy of fresh concrete
 - D. Ecology of fresh concrete

Ans. B

101. What is the minimum crushing strength of Granite used in India?

- A. 200 N/mm²
- B. 100 N/mm²
- C. 50 N/mm²
- D. 250 N/mm²

Ans. B

102. Gypsum is added to Portland cement during its manufacturing so that it may

- A. Accelerate the setting time
- B. Retard the setting time
- C. Decreases the burning temperature
- D. Facilitate grinding

Ans. B

103. Honey comb brick wall is measured in

- A. Metres
- B. Square metres
- C. Cube metres
- D. Number

Ans. B

104. The main constituent of cement which is responsible for initial setting of cement is

- A. Dicalcium silicate
- B. Tricalcium silicate
- C. Tricalcium aluminate
- D. None of the given answers

Ans. C

105. Drag lines are used to excavate

- A. Hard earth below ground level
- B. Soft earth below ground level
- C. Hard earth above ground level
- D. Soft earth above ground level

Ans. B

106. Brick earth contains major quantity of

- A. Silica
- B. Aluminium
- C. Calcium
- D. Magnesium

Ans. A

107. Among the following excavators the most suitable excavator for hard digging above track level will be

- A. Back hoe
- B. Front shovel
- C. Scraper
- D. Dragline

Ans. B

108. Physical life of an equipment is defined as

- A. age at which the equipment is worn out and it can no longer reliably produce
- B. the life over which the equipment can earn a profit
- C. time period that maximizes the profit over the equipment life
- D. age at which depreciation cost exceeds the purchase cost

Ans. A

109. Cavity or hollow space in a wall is provided for:

- 1) Prevention of dampness
 - 2) Heat insulation
 - 3) Sound insulation
 - 4) Efflorescence
- A. 1 and 2
 - B. 1 and 3
 - C. 1,2 and 4
 - D. 1,2,3 and 4

Ans. D

110. What are the advantages of a good site layout or job layout?

- A. Smooth and economical working of project
- B. It reduces the completion time of project.
- C. Provides more safety on site.
- D. All the above

Ans. D

111. Service plan:

- A. Is drawn to a scale not less than that of site plan
- B. Include layout of existing water supply system
- C. Shows predominant wind direction
- D. All the above

Ans. D

112. A window that projects outside the external walls of a room is:

- A. Gable window
- B. Sash window
- C. Dormer window
- D. bay window

Ans. D

113. If the void ratio and discharge velocity for soil is 0.5 and 5×10^{-7} m/s respectively, what will be the seepage velocity in m/s?

- A. 6×10^{-7}
- B. 15×10^{-7}
- C. 12×10^{-7}
- D. 3×10^{-7}

Ans. B

114. Following results are obtained from particle size analysis:

Uniformity coefficient = 8

Coefficient of curvature = 2.8

Percentage of soil passing through 75 μ IS sieve = 10%

Percentage of soil passing through 4.75 mm IS sieve = 70%

If liquid limit and plastic limit for the soil are 38% and 34.2% respectively, the soil can be classified as per IS soil classification system as

- A. SP-SM
- B. SW-SM
- C. SP-SC
- D. SW-SC

Ans. B

115. In laboratory compaction tests, the optimum moisture content of soil decreases

- A. With increase of compaction energy and with decrease of coarse grains in the soil
- B. With decrease of compaction energy and with increase of coarse grains in the soil
- C. With increase of both compaction energy and coarse grains in the soil
- D. With decrease of both compaction energy and coarse grains in the soil

Ans. C

116. To provide safety against piping failure, with a factor of safety of 5, what should be the maximum permissible exit gradient for soil with specific gravity of 2.5 and porosity of 0.35?

- A. 0.176
- B. 0.195
- C. 0.882
- D. 0.980

Ans. B

117. From a flownet which of the following information can be obtained?

- 1) Rate of flow
- 2) Pore water pressure
- 3) Exit gradient
- 4) Permeability

Select the correct answer using the codes given below:

- | | |
|-------------------|--------------|
| A. 1,2,3 and 4 | B. 1,2 and 3 |
| C. 2,3 and 4 only | D. 1 only |

Ans. B

118. Consider the following statements:

1. Dynamic cone penetration test for site investigation is based on the principle that elastic shock waves travel in different material at different velocities.
2. Electrical resistivity method of subsurface investigation is capable of detecting only the strata having different electrical resistivity.
3. In-situ vane shear test is useful for determining the shear strength of very soft soil and sensitive clays and is unsuitable for sandy soil.

Which of these statements is/are correct?

- | | |
|------------|------------|
| A. 1 and 2 | B. 2 and 3 |
| C. 1 and 3 | D. 2 alone |

Ans. B

119. Hygroscopic water is defined

- A. The water held by the soil under capillary action
- B. The readily available water for the use of plants
- C. The water which is absorbed by the particles of dry soil from the atmosphere
- D. Total water content of the soil filled with water

Ans. C

120. A flownet of a cofferdam foundation has 6 flow channels and 18 equipotential drops. The head loss during seepage is 6 m. If the coefficient of permeability of soil is 4×10^{-5} m/min, then the seepage loss (m^3/day) is

- | | |
|----------|----------|
| A. 72 | B. 8 |
| C. 0.115 | D. 1.037 |

Ans. C

121. A concentrated load of 50 kN acts vertically at a point on the soil surface. If Boussinesq's equation is applied for computation of stress, then the ratio of vertical stresses at depths of 3 m and 5 m respectively vertically below the point of application of load is

- | | |
|---------|---------|
| A. 0.36 | B. 0.60 |
| C. 1.66 | D. 2.77 |

Ans. D

122. The intensity of vertical stress at depth z below a concentrated load Q , by Boussinesq equation is:

A. $\sigma_z = 0.5775 \frac{Q}{z^2}$

B. $\sigma = 0.4775 Qz^2$

C. $\sigma_z = 0.4775 \frac{Q}{z^2}$

D. $\sigma = 0.5775 Qz^2$

Ans. C

123. An important hydraulic failure of earth dams is

- A. Piping
- B. Sloughing
- C. Upstream slope failure due to sudden drawdown
- D. Overtopping

Ans. D

124. The collapsible soil is associated with

- A. Dune sands
- B. Laterite soils
- C. Loess
- D. Black cotton soils

Ans. C

125. A layer of soil having $G = 2.67$ and $e = 0.67$ is subjected to an upward head of 1.5 m due to seepage of water. The depth of the soil layer required to provide a factor of safety 2 against piping is

- A. 1.5 m
- B. 2.0 m
- C. 3.0
- D. 0.75 m

Ans. C
