UPPSC-AE
Main Exam 2024

Uttar Pradesh
Public Service Commission

Assistant Engineer

CIVIL ENGINEERING
Paper-I

Questions & Answer Key

Exam held on 28-9-2025

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Q.1 निम्नलिखित में से 'छछूँदर के सिर पर चमेली का तेल' लोकोक्ति का अर्थ है:

(a) अयोग्य व्यक्ति को अच्छी चीज़ मिलना

(b) कुरूप काया को सुगंध के द्वारा सुंदर बनाने का प्रयास करना

(c) छछूँदर को मारने के बजाय उसे बचाना

(d) अयोग्य व्यक्ति को अपमानित करना

Ans. (a)

End of Solution

Q.2 "सिव द्रोही मम दास कहावा। सो नर सपनेहुँ मोहि न भावा।।
संकर बिमुख भगति चह मोरी। सो नारकीय मूढ़ मति थोरी।।"
उपर्युक्त काव्यांष में कौन–सा छंद है?

(a) दोहा (b) चौपाई

(c) सोरठा (d) बरवै

Ans. (b)

End of Solution

Q.3 निम्नलिखित विकल्पों में से सुमेलित **नहीं** है:

(a) आधा तीतर आधा बटेर–एक जैसी चाज़ों का सम्मिश्रण होना

(b) ईद का चाँद–बहुत दिनों बाद दिखाई देने वाला

(c) उल्टे बाँसा बरेली को–विपरीत कार्य करना

(d) एक आने के बर्तन–सब एक जैसे

Ans. (a)

End of Solution

Q.4 "हँसने लगे तब हरि अहा! पूर्णेन्दु–सा मुख खिल गया।"
उपर्युक्त काव्य–पंक्तियों में कौन–सा अलंकार है?

(a) रूपक (b) उपमा

(c) स्मरण (d) उत्प्रेक्षा

Ans. (b)

End of Solution

Q.5 निम्नलिखिते में से 'घर सिर पर उठाना' मुहावरे का अर्थ है:

(a) बहुत मेहनत करना (b) बहुत शोर करना

(c) कठिन काम करना (d) बहुत काम करना

Ans. (b)

End of Solution

Q.6 निम्नलिखित में से स्त्रीलिंग शब्द **नहीं** है:

(a) मंडली (b) प्रार्थना

(c) ऋतु (d) स्त्रीत्व

Ans. (d)

End of Solution

Q.7 निम्नलिखित में से कौन–सा वाक्य शुद्ध है?

(a) यहाँ–वहाँ जाया–आया करो। (b) बिजली आ–जा रही है।

(c) वह अपना सामान लेकर के जायेगा। (d) सभी सदस्य अपनी राय दें।

Ans. (d)

End of Solution

Q.8 ''कृपया आज का अवकाश देने की कृपा करें।''

उपर्युक्त वाक्य का शुद्ध रूप है:

(a) आज का अवकाश अवश्य प्रदान करें।

(b) आज का अवकाश देने की कृपा करें।

(c) संभव हो तो आज का अवकाश देने की कृपा करें।

(d) कृपया करके आज का अवकाश दें।

Ans. (d)

End of Solution

Q.9 काल के बोध का संबंध किससे होता है?

(a) वचन (b) क्रिया

(c) लिंग (d) कारक

Ans. (b)

End of Solution

Q.10 शुद्ध वर्तनी वाला शब्द है:

(a) अनुगृहीत (b) अन्ताक्षरी

(c) अनुगृह (d) अनुग्रहीत

Ans. (a)

End of Solution

Q.11 'कवि' शब्द का स्त्रीलिंग है:

(a) कवित्री (b) कवयित्री

(c) कवियित्री (d) काव्या

Ans. (b)

End of Solution

Q.12 'व' वर्ण है:

(a) अन्तस्थ व्यंजन (b) ऊष्म व्यंजन

(c) संयुक्त व्यंजन (d) नासिक्य व्यंजन

Ans. (a)

End of Solution

Q.13 निम्नलिखित में से 'चिकुर' शब्द का अर्थ है:

(a) केश (b) रंग

(c) दृष्टि (d) हाथ

Ans. (a)

End of Solution

Q.14 निम्नलिखित में से 'प्रतीप' शब्द का समानार्थी विकल्प चुनिए:

(a) प्रत्यक्ष (b) प्रशस्त

(c) विलोम (d) प्रवर

Ans. (c)

End of Solution

Q.15 'इतिवृत्त' शब्द के लिए निम्नलिखित में से कौन–सा एक वाक्यांश प्रयोग किया जाता है?

(a) इतिहास का जानकार

(b) किन्हीं घटनाओं का कालक्रम में किया गया यथातथ्य वर्णन

(c) घटनाओं को बढ़ा–चढ़ाकर बताने वाला

(d) किसी देश या समाज के सार्वजनिक क्षेत्र की घटनाओं, तथ्यों आदि का विवरण

Ans. (b)

End of Solution

Q.16 निम्नलिखित में से 'आंकुचन' शब्द का विलोम क्या है?

(a) प्रसारण (b) विकर्षण

(c) अनाकर्षक (d) विसर्जन

Ans. (a)

End of Solution

Q.17 निम्नलिखित में से 'उबटन' शब्द का तत्सम रूप क्या है?

(a) उबवर्तन (b) उद्वर्तन

(c) उदर्तन (d) उद्दर्तन

Ans. (b)

End of Solution

Q.18 निम्नलिखित में से एक 'देशज' शब्द **नहीं** है:

(a) फ़ैसला (b) फुनगी

(c) कटोरा (d) लोटा

Ans. (a)

End of Solution

Q.19 निम्नलिखित में से 'कर्पट' शब्द का तद्भव रूप है:

(a) कपट (b) कपूर

(c) कडुआ (d) कपड़ा

Ans. (d)

End of Solution

Q.20 वाक्यांश के लिए उपयुक्त शब्द की दृष्टि से निम्नलिखित युग्मों में से **ग़लत** युग्म की पहचान कीजिए:

(a) जिसकी थाह न मिले – अथाह

(b) जो जीता न जा सके – अजेय

(c) जिसके पास कुछ न हो – निर्धन

(d) अण्डे से जन्म लेने वाला – अण्डज

Ans. (c)

End of Solution

Q.21 निम्नलिखित में से 'पर्वत के ऊपर की समतल भूमि' वाक्यांश के लिए एक शब्द है:

(a) उपत्यका (b) अधित्यका

(c) आधिपत्य (d) अथाह

Ans. (b)

End of Solution

Q.22 'उल्लंघन' शब्द में कौन–सा उपसर्ग है?

(a) उ (b) उल्

(c) उत् (d) उल्ल

Ans. (c)

End of Solution

Q.23 'अन्वीक्षण' का संधि–विच्छेद है:

(a) अनु + ईक्षण (b) अना + ईक्षण

(c) अन् + इक्षण (d) अनु + इक्षण

Ans. (a)

End of Solution

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Q.24 'कृत्' प्रत्यय किसके साथ जुड़ते हैं?

(a) सर्वनाम के
(b) संज्ञा के
(c) क्रिया अथवा धातु के
(d) विशेषण के

Ans. (c)

End of Solution

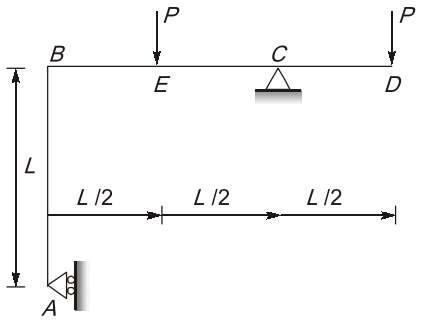
Q.25 'विभागाध्यक्ष' शब्द में समास है:

(a) सम्प्रदान तत्पुरूष
(b) कर्मधारय
(c) संबंध तत्पुरूष
(d) करण तत्पुरूष

Ans. (c)

End of Solution

26. A frame ABCD is supported by a roller at 'A' and is on a hinge at 'C' as shown in the figure. The reaction at the roller end 'A' is:



(a) 2P
(b) P
(c) P/2
(d) Zero

Ans. (d)

End of Solution

27. A beam 10 m long, hinged at both ends is subjected to a clockwise moment of 40 kNm at a distance of 3 m from one end. Shear force at centre of beam is:

(a) 4 kN
(b) 6 kN
(c) 3 kN
(d) 2 kN

Ans. (a)

End of Solution

28. The angular velocity (in rad/s) of a body rotating at 'N' revolutions per minute is _____

(a) $2\pi N/60$
(b) $\pi N/60$
(c) $\pi N/180$
(d) $2\pi N/180$

Ans. (a)

End of Solution

29. The permissible load for short column with helical reinforcement shall be _____ times as compared to load in a similar member with lateral ties.
(a) 1.41 (b) 2
(c) 1.05 (d) 1.01

Ans. (c)

End of Solution

30. In T-Section — ISNT 100, 100 represents _____ of tee bar (in mm).
(a) Length (b) Depth
(c) Width (d) None of the above

Ans. (b)

End of Solution

31. According to IS 456, the maximum strain in concrete at the outermost compression fibre is taken as:
(a) 0.002 (b) 0.003
(c) 0.0035 (d) 0.0025

Ans. (c)

End of Solution

32. According to IS 456, spacing of longitudinal bars measured along the periphery of the column shall not exceed ___ mm.
(a) 250 (b) 300
(c) 350 (d) 200

Ans. (b)

End of Solution

33. Moment of inertia of a triangle of base 6 m and height 3 m is _____ m^4.
(a) 13.5 (b) 27.0
(c) 9.0 (d) 4.5

Ans. (d)

End of Solution

34. As per IS 456, maximum shear stress (τ_c max) is ___ N/mm^2 for concrete grade of M40 and above.
(a) 2.5 (b) 1.5
(c) 3.0 (d) 2.0

Ans. (*)

End of Solution

35. A structure is to be constructed where basic wind speed is 47 m/s, risk factor = 1.0, terrain and size factor = 0.98, topographic factor = 1.
Basic wind pressure will be ___ N/mm^2 (approximately).
(a) 2120 (b) 46
(c) 1272 (d) 15.6

Ans. (c)

End of Solution

36. In reinforced concrete beam, concrete is assumed to take no ___
(a) Shear (b) Tension
(c) Compression (d) None of the above

Ans. (b)

End of Solution

37. For connecting lacing flats to column sections with 18 mm diameter bolt, the minimum width of flat should be ___ mm.
(a) 60 (b) 59
(c) 54 (d) 36

Ans. (c)

End of Solution

38. In a bolted connection, ___ pattern will give maximum efficiency.
(a) Chain (b) Staggered
(c) Diamond (d) None of the above

Ans. (c)

End of Solution

39. A steel plate is 30 cm wide and 10 mm thick. If the diameter of the bolt hole is 20 mm, then the net section area of the plate is ___ cm^2.
(a) 280 (b) 300
(c) 28 (d) 32.42

Ans. (c)

End of Solution

40. Butt weld is also known as
(a) Lap weld (b) Green weld
(c) Groove weld (d) None of the above

Ans. (c)

End of Solution

41. In a conjugate beam, the free end of a real (actual) beam will become the ___ end.
(a) Hinged (b) Free
(c) Fixed (d) None of the above

Ans. (c)

End of Solution

42. The top chord of a roof truss is inclined at an angle of 22°. No access is provided for maintenance. The live load to be considered for design will be ___ kN/m^2.
(a) 0.75 (b) 0.61
(c) 1.50 (d) Zero

Ans. (a)

End of Solution

43. As per IS 456, the ratio of allowable bond stress in tension in deformed bars to that of plain bars is about:
(a) 1.2 (b) 1.3
(c) 1.6 (d) 1.4

Ans. (c)

End of Solution

44. A simply supported beam prestressed with a force of 2500 kN is designed by load balancing concept for an effective span of 10 m and to carry a total UDL of 40 kN/m. The central dip of the cable profile should be ___ mm.
(a) 200 (b) 100
(c) 300 (d) 400

Ans. (a)

End of Solution

45. When geotextiles are placed under water, the minimum overlap should be ___ mm.
(a) 750 (b) 600
(c) 900 (d) 450

Ans. (c)

End of Solution

46. If flownet of a cofferdam foundation has h = 6 m, N_f = 6, N_d = 18 and K = 4 × 10^{-5} m/min, then discharge (in m^3/day) per m length will be ___
(a) 1.2304 (b) 2.304
(c) 0.1152 (d) 1.0368

Ans. (c)

End of Solution

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47. Test pit in a plate load test at foundation level is generally of width ___ times the test plate.

(a) 3 (b) 6
(c) 4 (d) 5

Ans. (a)

End of Solution

48. Electro-osmosis for a clayey soil generally leads to:

(a) Increase in water content
(b) Increase in plasticity
(c) Decrease in shear strength
(d) Increase in shear strength

Ans. (d)

End of Solution

49. For a Standard Proctor compaction test, the mass of hammer (in kg) and drop of hammer (in mm) are respectively:

(a) 2.6 and 450 (b) 4.8 and 310
(c) 4.89 and 450 (d) 2.6 and 310

Ans. (d)

End of Solution

50. A soil has a liquid limit of 30. The corresponding plasticity index given by A-line is:

(a) 9.5 (b) 9.8
(c) 7.3 (d) 7.6

Ans. (c)

End of Solution

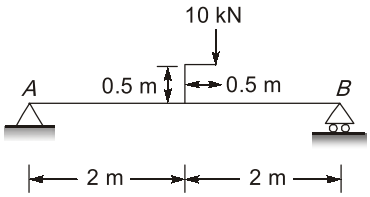
51. A soil sample has LL = 45%, PL = 25% and SL = 15%. For a natural water content of 30%, the consistency index will be:

(a) 25% (b) 40%
(c) 50% (d) 75%

Ans. (d)

End of Solution

52. The reaction at support 'B' of the statically determinate beam shown below is ___ kN.

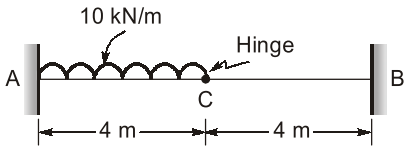


(a) 4.25
(b) 5.75
(c) 3.75
(d) 6.25

Ans. (d)

End of Solution

53. Determine the reactions at 'C' of the beam shown below:



(a) 6.5 kN
(b) 7.5 kN
(c) 8.5 kN
(d) 5.5 kN

Ans. (b)

End of Solution

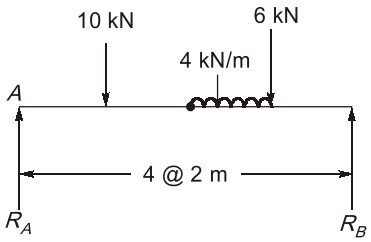
54. A simply supported beam is acted upon by a concentrated load at the centre. It causes a maximum deflection of 10 mm and slope at ends of 0.002 radians. The span of the beam is ___ m.

(a) 10
(b) 15
(c) 16
(d) 12

Ans. (b)

End of Solution

55. The ratio of reactions R_A and R_B in the simply supported beam shown in the figure is _____.



(a) 1.50
(b) 0.75
(c) 0.50
(d) 1.00

Ans. (d)

End of Solution

56. The capillary rise in silt is 50 cm and that of fine sand is 30 cm. The difference in pore size of these two soils is:

(a) 6.00×10^{-3} cm (b) 3.00×10^{-3} cm
(c) 8.00×10^{-3} cm (d) 4.00×10^{-3} cm

Ans. (d)

End of Solution

57. The re-compression index is about ___ of the compression index.

(a) 1/2 (b) 1/20
(c) 1/10 to 1/5 (d) 5 times

Ans. (c)

End of Solution

58. A soil has a discharge velocity of 6×10^{-7} m/s and a void ratio of 0.5. Its seepage velocity is _____ m/s.

(a) 12×10^{-7} (b) 18×10^{-7}
(c) 36×10^{-7} (d) 24×10^{-7}

Ans. (b)

End of Solution

59. The range of optimum moisture content for the Standard Proctor test for clayey soil is:

(a) 14% to 20% (b) 12% to 16%
(c) 6% to 10% (d) 8% to 12%

Ans. (a)

End of Solution

60. A concentrated load of 50 kN acts on the surface of ground. The vertical stresses directly below the load at a depth of 4 m will be ___ kN/m^2. The value of influence factor is 0.48.

(a) 1.5 (b) 15.0
(c) 150.0 (d) 0.15

Ans. (a)

End of Solution

61. For a highly over-consolidated clay, the pore water pressure coefficient 'A_f' is in the range of:

(a) 0.7 to 1.3 (b) –1.0 to –0.5
(c) –0.5 to 0.0 (d) 0.3 to 0.7

Ans. (c)

End of Solution

62. For finding final setting time of cement by Vicat Apparatus, diameter of the needle used is _____ mm.

(a) 1
(b) 0.1
(c) 0.5
(d) 5

Ans. (d)

End of Solution

63. Barkan's Relation (formula) is given by:
[where:
K = Stiffness
E = Young's Modulus
μ = Poisson's Ratio
A = Base area of machine]

(a) $K=\left(\frac{1.13E}{1-\mu^2}\right)A$
(b) $K=\left(\frac{1.13E}{1+\mu^2}\right)A$
(c) $K=\left(\frac{1.13E}{1-\mu^2}\right)\sqrt{A}$
(d) $K=\left(\frac{1.13E}{1+\mu^2}\right)\sqrt{A}$

Ans. (a)

End of Solution

64. To find the efficiency of the utilization of resources on the project, cost performance indicator (CPI) can be calculated as:
[where:
PV = Planned value
AC = Actual cost
EV = Earned value]

(a) Ratio of EV and AC
(b) AC/PV
(c) AC/EV
(d) PV/AC

Ans. (a)

End of Solution

65. As per IS code, the depth of well foundations should not be less than _____ times the maximum scour depth.

(a) 1.2
(b) 1.5
(c) 1.75
(d) 1.33

Ans. (d)

End of Solution

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66. Relation between E, K and C is given by:
[E, K and C have usual meaning.]

(a) $E = \frac{3K + C}{6KC}$ (b) $E = \frac{3KC}{3K + C}$

(c) $E = \frac{6KC}{3K + C}$ (d) $E = \frac{9KC}{3K + C}$

Ans. (d)

End of Solution

67. A cantilever beam 6 m long carries a point load of 100 kN at its free end and a point load 'W' at its middle. If the maximum bending moment in the cantilever beam is 900 kNm, the value of load 'W' will be _____ kN.

(a) 100 (b) 150
(c) 250 (d) None of the above

Ans. (a)

End of Solution

68. The state of 2D stress at a point is given by a matrix:

$$\begin{bmatrix} \sigma_{xx} & \tau_{xy} \\ \tau_{yx} & \sigma_{yy} \end{bmatrix} = \begin{bmatrix} 100 & 30 \\ 30 & 20 \end{bmatrix} \text{MPa}$$

The maximum shear stress will be ___ MPa.

(a) 100 (b) 110
(c) 50 (d) 75

Ans. (c)

End of Solution

69. The diameter of kernel of a hollow circular section is:
[where:
d = internal diameter
D = external diameter]

(a) $\frac{D^2 + d^2}{D}$ (b) $\frac{D^2 + d^2}{4D}$

(c) $\frac{D^2 + d^2}{2D}$ (d) $\frac{D + d}{2}$

Ans. (b)

End of Solution

70. Gantt Chart has ___ coordinates.
(a) 4 (b) 5
(c) 2 (d) 3

Ans. (c)

End of Solution

71. In a roof, queen post truss is commonly used for spans:
(a) up to 3.5 m (b) from 5.0 m to 8.0 m
(c) from 8.0 m to 12.0 m (d) from 3.5 m to 5.0 m

Ans. (c)

End of Solution

72. The damp-proof course:
I. may be horizontal or vertical
II. should be continuous
III. should be of good impervious material
Choose the correct option:
(a) I, II and III are correct (b) I and III are correct
(c) II and III are correct (d) I and II are correct

Ans. (a)

End of Solution

73. The process of sulphate attack causes/effects ___ in concrete.
(a) compression and cracking (b) expansion and cracking
(c) compression (d) None of the above

Ans. (b)

End of Solution

74. A moulding provided under the nosing to beautify the elevation of a step and to provide strength to nosing is called:
(a) Newel Post (b) Soffit
(c) Baluster (d) Scotia

Ans. (d)

End of Solution

75. The lowest part of a structure which transmits the load to the soil is known as:
(a) Plinth (b) Superstructure
(c) Basement (d) Substructure

Ans. (d)

End of Solution

76. The unit of coefficient of consolidation (C_v) is:

(a) cm/s (b) cm^2/s

(c) cm/s^2 (d) None of the above

Ans. (b)

End of Solution

77. A 30 cm diameter concrete pile is driven into a homogeneous consolidated clay deposit ($c = 40\ kN/m^2$ and $\alpha = 0.7$). If the embedded length of the pile is 10 m, estimate the safe load (FOS = 2.5) in kN.

(a) 222π (b) 148π

(c) 74π (d) 37π

Ans. (d)

End of Solution

78. In the case of silty fine sands, when the observed value of penetration number (N) exceeds 15, the corrected penetration number (N_C) will be:

(a) $15-\left(\frac{N-15}{2}\right)$ (b) $15+\left(\frac{N-15}{2}\right)$

(c) $15-\left(\frac{N+15}{2}\right)$ (d) $15+\left(\frac{N+15}{2}\right)$

Ans. (b)

End of Solution

79. According to Rankine's formula, the minimum depth of foundation when $q = 180\ kN/m^2$, $\gamma = 20\ kN/m^3$ and $\phi = 30°$, is _____ m.

(a) 1.0 (b) 4.0

(c) 2.0 (d) 0.5

Ans. (a)

End of Solution

80. Single-sheet pile cofferdams are suitable up to a height of _____ m.

(a) 15 (b) 4

(c) >15 (d) 10

Ans. (b)

End of Solution

81. Equipment productivity refers to:
(a) The cost-effectiveness of construction materials
(b) The output achieved by construction equipment in a given time
(c) The efficiency of construction workers
(d) The safety measures implemented on a construction site

Ans. (b)

End of Solution

82. The costs associated with accidents on construction sites are:
(a) Both direct costs and indirect costs
(b) Only indirect costs
(c) Only direct costs
(d) None of the above

Ans. (a)

End of Solution

83. Slip Forming is commonly used for constructing:
(a) One-storey residential buildings
(b) Bridges
(c) Tall buildings
(d) Steel buildings

Ans. (c)

End of Solution

84. The angle of inclination of a stair with the floor is known as:
(a) Pitch
(b) Rise
(c) Run
(d) Landing

Ans. (a)

End of Solution

85. A ___ graded aggregate is an aggregate in which one or more intermediate sizes are missing.
(a) Dense
(b) Gap
(c) Open
(d) Normally

Ans. (b)

End of Solution

86. The horizontal upper portion of a step on a staircase is known as:
(a) Waist
(b) Soffit
(c) Tread
(d) None of the above

Ans. (c)

End of Solution

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87. For a stair, the sum of riser and tread, in centimetres, should be:
(a) 40 - 45 (b) 25 - 35
(c) 10 - 20 (d) 20 - 25

Ans. (a)

End of Solution

88. The minimum frequency limit of sampling of concrete of each grade for volume 6 – 15 m^3 shall be:
(a) 1 (b) 4
(c) 3 (d) 2

Ans. (d)

End of Solution

89. What is the permissible tolerance as per IS code for the reinforcement placed for effective depth 200 mm or less?
(a) ± 5 mm (b) ± 15 mm
(c) ± 10 mm (d) None of the above

Ans. (c)

End of Solution

90. What is the minimum grade of concrete for reinforced concrete work (for severe exposure)?
(a) M15 (b) M25
(c) M10 (d) M20

Ans. (*)

End of Solution

91. What is the maximum effective slenderness ratio of a beam, strut or tension member in which reversal of direct stress occurs due to loads other than wind or seismic force?
(a) 180 (b) 250
(c) 300 (d) 350

Ans. (a)

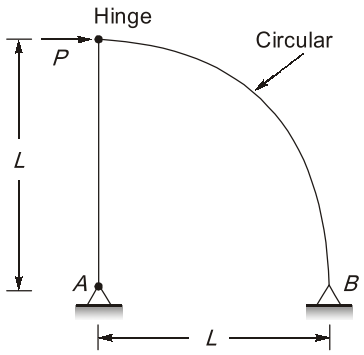
End of Solution

92. Allowable average shear stress in an unstiffened web of beams made of steel of grade 250 N/mm^2 is ___ N/mm^2.
(a) 165 (b) 250
(c) 100 (d) 150

Ans. (c)

End of Solution

93. Reaction at support 'B' of the structure shown in the figure is:



(a) $P\sqrt{2}$ (b) P

(c) $\frac{P}{2}$ (d) $\frac{P}{\sqrt{2}}$

Ans. (b)

End of Solution

94. General equation for finding deflection in a beam is given by the equation: (Symbols have usual meaning)

(a) $M = EI\frac{d^2y}{dx^2}$ (b) $M = EI\frac{dy}{dx}$

(c) $\frac{M}{EI^2} = \frac{d^2y}{dx^2}$ (d) None of the above

Ans. (a)

End of Solution

95. An isotropic soil has the vertical permeability of 'k' and horizontal permeability of '4k'. The equivalent permeability of the transformed section is:

(a) 2.0 k (b) 1.5 k

(c) 8.0 k (d) 0.5 k

Ans. (a)

End of Solution

96. What is the minimum value of reinforcement for design of machine foundation of the machines that pump explosive gases?

(a) 25 kg/m^3 (b) 50 kg/m^3

(c) 40 kg/m^3 (d) 30 kg/m^3

Ans. (c)

End of Solution

97. A dry sand specimen was tested in a triaxial machine with cell pressure of 50 kPa. If the deviator stress at failure was 100 kPa, then the angle of shearing resistance is:
(a) 40° (b) 15°
(c) 60° (d) 30°

Ans. (c)

End of Solution

98. Deadweight used for applying a test load on a pile is known as:
(a) Safe load (b) Working load
(c) Allowable load (d) Kentledge

Ans. (d)

End of Solution

99. For a void ratio of 0.60, the relationship between the specific gravity of solids (G) and the hydraulic gradient (i) for quicksand condition is _____.
(a) $G = 0.6i + 1$ (b) $G = 1.6i - 1$
(c) $G = i + 0.6$ (d) $G = 1.6i + 1$

Ans. (d)

End of Solution

100. Kani's method is an excellent extension of:
(a) Moment Area method (b) Slope-Deflection method
(c) Unit Load method (d) None of the above

Ans. (b)

End of Solution

101. A cantilever beam of length 4 m carries a UDL of intensity 'w' kN/m throughout its length. If the maximum bending moment in the cantilever beam is 80 kNm, slope at the free end of the cantilever beam will be _____.
(a) $\frac{320}{3EI}$ (b) $\frac{640}{3EI}$
(c) $\frac{160}{3EI}$ (d) None of the above

Ans. (a)

End of Solution

102. A strut of length 'L' is fixed at one end and free at the other. Euler's buckling load for this strut is 10 kN. If both the ends of the strut are now fixed, what will be its Euler's buckling load?

(a) 180 kN
(b) 120 kN
(c) 160 kN
(d) 25 kN

Ans. (c)

End of Solution

103. The frequency of oscillation of a compound pendulum is:
[where:
K_G = Radius of gyration about the centroidal axis, and
h = Distance between the point of suspension from centre of gravity]

(a) $2\pi\sqrt{\frac{gh}{K_G^2+h^2}}$
(b) $2\pi\sqrt{\frac{K_G^2+h^2}{gh}}$
(c) $\frac{1}{2\pi}\sqrt{\frac{K_G^2+h^2}{gh}}$
(d) $\frac{1}{2\pi}\sqrt{\frac{gh}{K_G^2+h^2}}$

Ans. (d)

End of Solution

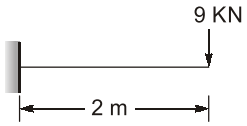
104. The energy possessed by a body for doing work by virtue of its position is known as:

(a) Kinetic Energy
(b) Angular Kinetic Energy
(c) Strain Energy
(d) Potential Energy

Ans. (d)

End of Solution

105. A cantilever beam is shown in the figure. The moment to be applied at the free end of the beam for zero deflection at that point is _____.



(a) 12 kN-m
(b) 9 kN(-)
(c) 12 kN-m(-)
(d) 9 kN(-)

Ans. (c)

End of Solution

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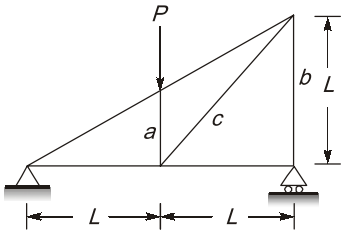
106. As shown in the figure, the forces in members a, b, c in the truss are respectively:



(a) $\frac{P}{2}, P,$ zero

(b) $P, \frac{P}{2},$ zero

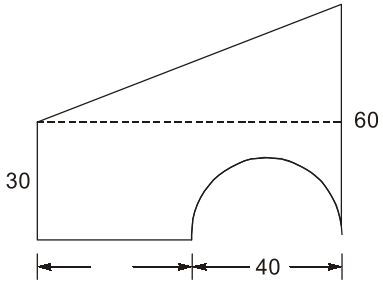
(c) $\frac{P}{2}, \frac{P}{2}, P$

(d) P, P, P

Ans. (b)

End of Solution

107. A semi-circular area is removed from a trapezium as shown in the figure. The centroid of the remaining area with reference to the base of trapezium will be approximately:



(a) 31.2

(b) 28.7

(c) 24.3

(d) 26.5

Ans. (a)

End of Solution

108. In order to double the period of simple pendulum, the length of the string should be:

(a) Tripled

(b) Doubled

(c) Halved

(d) Quadrupled

Ans. (d)

End of Solution

109. One Watt is equal to _____

(a) 1 WN-s

(b) 1 N-m^2/s

(c) 1 N-m/s

(d) 1 N/m-s

Ans. (c)

End of Solution

110. The value of coefficient of restitution (e) for neither perfectly inelastic nor perfectly elastic body is _____.

(a) 1
(b) Between 0 and 1
(c) 0
(d) None of the above

Ans. (b)

End of Solution

111. Maximum deflection 'y' in a cantilever beam of length 'L' carrying a point load 'W' at free end is given by:
['E' and 'I' have usual meaning.]

(a) $y = \frac{5}{384}\frac{WL^4}{EI}$
(b) $y = \frac{3WL^5}{48EI}$
(c) $y = \frac{WL^3}{3EI}$
(d) $y = \frac{WL^3}{48EI}$

Ans. (c)

End of Solution

112. Which of the following glass is most suitable to withstand high temperature?

(a) Lead glass
(b) Tempered glass
(c) Soda-lime glass
(d) Borosilicate glass

Ans. (d)

End of Solution

113. In a water tank design, (internal diameter < 6 m), minimum thickness of concrete shell for shaft type staging shall be _____ mm.

(a) 180
(b) 200
(c) 160
(d) 225

Ans. (c)

End of Solution

114. Minimum pitch in riveted connection shall not be less than _____ times the nominal diameter of rivet.

(a) 3.0
(b) 3.20
(c) 2.50
(d) None of the above

Ans. (c)

End of Solution

115. For fire-resistant masonry, which stone from the following should be preferred?
(a) Compacted sandstone (b) Limestone
(c) Fine grained granite (d) None of the above

Ans. (a)

End of Solution

116. When maximum stresses in both steel and concrete simultaneously reach their allowable values, the section is said to be a/an:
(a) Underground section (b) Unbalanced section
(c) Balanced section (d) Over-reinforced section

Ans. (c)

End of Solution

117. Limiting value of depth of neutral axis for Fe 415 is:
[where d = effective depth]
(a) 0.48 d (b) 0.42 d
(c) 0.46 d (d) 0.53 d

Ans. (a)

End of Solution

118. Bored compaction piles are modification of:
(a) Under-reamed pile (b) Sheet pile
(c) Sand pile (d) None of the above

Ans. (c)

End of Solution

119. The weight of Portland cement for standard purposes is taken as:
(a) 0.55 kg/m^3 (b) 1000 kg/m^3
(c) 1430 kg/m^3 (d) 2000 kg/m^3

Ans. (c)

End of Solution

120. As per Indian Standards, OPC cement is available in _____ grade(s).
(a) 4 (b) 2
(c) 3 (d) 1

Ans. (b)

End of Solution

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121. For 'Acid test' of stones, stones are kept in 1% hydrochloric acid (HCl) for _____ day(s).
(a) 7 (b) 3
(c) 1 (d) 14

Ans. (a)

End of Solution

122. Density of solid concrete blocks to be used as load-bearing walls should be:
(a) More than 1800 kg/m^3 (b) Approximately 1000 kg/m^3
(c) Exactly 2400 N/m^2 (d) Less than 1800 kg/m^3

Ans. (a)

End of Solution

123. Barbed wire fencing is measured in _____ units.
(a) Gauge (b) Square metre
(c) Cubic metre (d) Metre

Ans. (d)

End of Solution

124. While conducting the 'Smith Test' for stones, stones are to be kept immersed in water for a minimum period of _____ hours.
(a) 12 (b) 48
(c) 8 (d) 24

Ans. (d)

End of Solution

125. What does steel jacketing refer to?
(a) Wrapping the entire building in 'FRP'
(b) Base isolation
(c) Encasement of individual columns with steel plates
(d) Adding shear walls

Ans. (c)

End of Solution

■■■■