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102	**QUESTION BOOKLET** **Post: Jr. Engineer (Civil)** INSTRUCTIONS	Q.B. Number:
Roll Number:		Q.B. Series: A

Please read the following instructions carefully.

1) Mark carefully your Roll Number, Question Booklet Number and series of the paper on the OMR Answer Sheet and sign at the appropriate place. Write your Roll number on the question booklet.

2) Strictly follow the instructions given by the Centre Supervisor / Room invigilator and those given on the Question Booklet. Please ensure you fill all the required details and shade the bubbles correctly on the OMR Answer Sheet.

3) Please mark the right responses ONLY with Blue/Black ball point pen. USE OF PENCIL AND GEL-PEN IS NOT ALLOWED.

4) Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, scanning devices, pagers etc. to the Examination Hall. Any candidate found using, or in possession of such unauthorized material, indulging in copying or impersonation or adopting unfair means, is liable to be summarily disqualified and may be subjected to penal action.

5) After finishing the examination, hand over the complete question booklet and the OMR Answer Sheet. DO NOT carry the question booklet or any part of it, outside the examination room. Doing so, is a punishable offence.

6) The test is of objective type. This Question Booklet contains a total of 150 questions and the total time allotted is 2 hours 30 minutes.

7) Each objective question is followed by four responses. Your task is to choose the correct response and mark your response on the OMR Answer Sheet and NOT on the Question Booklet.

8) All questions are compulsory. There will be no NEGATIVE MARKING.

9) For each answer as shown in the example below. The CORRECT and the WRONG method of darkening the CIRCLE on the OMR sheet are given below.

Correct Method

Wrong Method

10) In view of the tight time span, do not waste your time on a question which you find to be difficult. Go on solving questions one by one and come back to the difficult questions at the end.

11) DO NOT make any stray marks anywhere on the OMR Answer Sheet. DO NOT fold or wrinkle the OMR Answer Sheet. Rough work MUST NOT be done on the answer sheet. Use your question booklet for this purpose.

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1. What is the permissible width of crack in concrete structures as per the IS: 456-2000 for moderate environmental conditions?
   (A) 0.2 mm
   (B) 0.4 mm
   (C) 0.6 mm
   (D) 0.8 mm

2. According to Indian Road Congress recommendation, the maximum limit of super elevation for mixed traffic in plain terrain is
   (A) Equal to camber
   (B) 1 in 10
   (C) 1 in 12.5
   (D) 1 in 15

3. What is the name of the equation, V = sqrt (Cmi), where 'C' is a constant, 'm' is hydraulic mean depth and 'i' is hydraulic depth?
   (A) Euler's equation
   (B) Darcy Weisbach equation
   (C) Chezy's formula
   (D) Navier Stoke's equation

4. If the R.L of a B.M is 50 m, the back sight is 1.25 and foresight is 1.85, then what will be the R.L of the forward station?
   (A) 46.9
   (B) 49.4
   (C) 50.6
   (D) 53.1

5. Which of the following Indian standard code has the Live or Imposed loads specified for different types of floors?
   (A) IS:456
   (B) IS:800
   (C) IS:875
   (D) IS:1893

6. A round steel bar of overall length 20 cm consists of two equal portion of 10 cm each having diameter of 4 cm and 5 cm respectively, if the rod is subjected to a tensile load of 10 tones then what will be the elongation (where modulus of elasticity $E=2X10^6Kg/cm^2$)?
   (A) 1(1/16+1/25)/10π cm
   (B) 2(1/16+1/25)/10π cm
   (C) 3(1/16+1/25)/10π cm
   (D) 4(1/16+1/25)/10π cm

7. If reinforcement in a beam is cut parallel to its length in plan, the reinforcement will be represented in section as which of the following options?
   (A) Small darkened circle
   (B) Two horizontal parallel lines
   (C) Two crossed lines
   (D) Two vertical parallel lines

8. Nagpur road plan formulae were prepared by assuming
   (A) Rectangular or block road pattern
   (B) Radial or star and block road pattern
   (C) Radial or star and circular road pattern
   (D) Radial or star and grid road pattern

9. Which of the following is a permanent adjustment in the Compass Survey Instrument?
   (A) Vertical pivot axis
   (B) Centering
   (C) Leveling
   (D) Focusing

10. The actual velocity of water flowing through the voids called as
    (A) Seepage velocity
    (B) Infiltration velocity
    (C) Flow velocity
    (D) Void velocity

11. The characteristic strength of a material is defined as
(A) The value below which not more than 10% of sample may fail
(B) The value below which not more than 5% of sample may fail
(C) The value below which not more than 15% of sample may fail
(D) The value below which not more than 2.5% of sample may fail

12. What are the effects on the body with mass immersed in a fluid which is under motion?
(A) Lift and drag
(B) Drag and friction
(C) Lift and friction
(D) Friction and shear

13. A fixed beam AB is subjected to a triangular load varying from zero at end A to W per unit length at end B. What is the ratio of fixed end moment at A to B?
(A) 1/3
(B) 1
(C) 2/3
(D) 3/2

14. Which of the following is the Coulomb shear strength equation?
(A) $S= c + \Omega \cos \varphi$
(B) $S= \Omega + c \tan \varphi$
(C) $S= c + \Omega \tan \varphi$
(D) $S= \Omega + c \cos \varphi$

15. A Plot of land measures 30 cm x 60 cm on a map drawn to scale 1 cm= 50 m. What will be the area of the map when placed on a topographical map drawn to a scale of 1 cm = 600 m?
(A) 15.0 sq.cm
(B) 22.5 sq.cm
(C) 12.5 sq.cm
(D) 24.0 sq.cm

16. Which of the following is a statically determinate structural member?
(A) Fixed beam
(B) Continuous beam
(C) Simply supported beam
(D) Portal frame

17. Which of the following rule in a network is true?
(A) Event can occur even if all activities leading to it are not completed.
(B) An event can occur twice
(C) There can be dead ends
(D) There must be only single initial node

18. If the design speed is V kmph and deviation angle is N radians, then the total length of a valley curve in meter is expressed as
(A) $3.8\ NV^{1/2}$
(B) $3.8\ (NV^3)^{1/2}$
(C) $0.38\ (NV^3)^{1/2}$
(D) $0.38\ NV^{3/2}$

19. Highway facilities are designed for which of the following?
(A) Annual average hourly volume
(B) Annual average daily traffic
(C) Thirtieth highest hourly volume
(D) Peak hourly volume of the year

20. If the compacting factor of a concrete is 0.90, then what will be the workability according to Indian Standards?
(A) Very low
(B) Low
(C) Medium
(D) High

21. What is the pH value of a water logged field, if the top soil has become alkaline and water logged?
(A) 8
(B) 9
(C) 10
(D) 11

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22. For construction of buildings in seismic prone areas, the structural engineer should refer which of the following codes along with IS 456?
(A) 13920-1994
(B) 13910-1993
(C) 13910-1994
(D) 13920-1993

23. What is the intensity of irrigation, if the total area of the field is 1000 acres and the cultivable commanded area is 65 acres?
(A) 6.50%
(B) 0.65%
(C) 65%
(D) 0.065%

24. What is the minimum clear cover (in mm) to the main steel bars in column?
(A) 10
(B) 15
(C) 25
(D) 40

25. What is the detention period and overflow rate for plain sedimentation tank compared to sedimentation with coagulation?
(A) Less and more respectively
(B) Less and less respectively
(C) More and less respectively
(D) More and more respectively

26. The method of analysis of distribution system in which domestic supply is neglected and fire demand is considered is
(A) Equivalent method
(B) Circle method
(C) Electrical analysis method
(D) Hardy-cross method

27. What shall be the maximum spacing of vertical shear reinforcement in a structural member along the axis of the member, if "d" is the effective depth of the section?
(A) 0.25d
(B) 0.5d
(C) 0.75d
(D) 1.0d

28. Vertical curves are provided where algebraic difference between grades is equal to or
(A) More than 4 mm/m
(B) Less than 4 mm/m
(C) More than 2 mm/m
(D) Less than 2 mm/m

29. What shall be the back bearing of a line, if its fore bearing is 280 degree?
(A) 80 degree
(B) 100 degree
(C) 190 degree
(D) 200 degree

30. Which type of operation in a network requires neither any time nor any resources?
(A) Parallel
(B) Dummy
(C) Serial
(D) Redundancy

31. Which type of frame it will be, if it has 3 joints & 4 members?
(A) Deficient
(B) Perfect
(C) Redundant
(D) Efficient

32. The y component of velocity in a two dimensional incompressible flow is given by v=2y. At the point (0, 1) the x component of velocity u=0. What is the equation for the x component of velocity?
(A) u=0
(B) u=2x
(C) u=-2x
(D) u=2y

33. What is the minimum grade of concrete used in pre-stressed concrete for pre-tensioned members?
(A) M15
(B) M20
(C) M30
(D) M40

34. The number of independent equations to be satisfied for static equilibrium of a plane structure is
(A) 4
(B) 7
(C) 3
(D) 5

35. The rate of filtration through slow sand filters in million liter/day/hectare is
(A) 50 - 60
(B) 100 - 150
(C) 500 - 600
(D) 1400 - 1500

36. Composite sleeper index is the index of
(A) Toughness and Wear resistance
(B) Strength and Toughness
(C) Hardness and Strength
(D) Wear resistance and Hardness

37. Wear of rails is maximum in
(A) Tangent track
(B) Tunnels
(C) Sharp curve
(D) Coastal area

38. In the limit state design as per IS 456:2000, the shape of the compressive stress block of concrete is a combination of rectangular and
(A) Elliptical shape
(B) Circular shape
(C) Parabolic shape
(D) Trapezoidal shape

39. As per IS 456: 2000 recommendations, the latest time by which the formwork can be removed from columns, walls and beams is given by which of the following choices?
(A) 10 hours
(B) 12 hours
(C) 16 hours
(D) 15 hours

40. While measuring linear distance with a tape by applying normal tension, which of the following corrections is automatically rectified?
(A) Correction due to sag only
(B) Correction due to pull only
(C) Correction due to sag and pull
(D) Correction due to alignment

41. Which one of the following failures is caused by loose fish bolts at expansion joints?
(A) Angular break
(B) Crushed head
(C) Split head
(D) Transverse fissures

42. What is the correction for refraction as applied to staff reading (where R is radius of earth)?
(A) $d^2/2R$
(B) $1/7(d^2/2R)$
(C) $6/7(d^2/2R)$
(D) $1/7(d^2/R)$

43. What is the basic span / depth ratio specified in the code for control of deflection limit state in structural concrete members for continuous support?
(A) 7
(B) 20
(C) 26
(D) 36

44. For which of the following reasons, the water shed line is abandoned for aligning an irrigation canal?
(A) It is densely populated
(B) The terrain is plain
(C) Canal is independent of river
(D) Irrigation canal is deep

45. Which type of survey facilitates field observations and the plotting on a sheet simultaneously?
(A) Compass
(B) Chain
(C) Theodolite
(D) Plane Table

46. A channel has a mean velocity of 0.6 m/s, which will keep the channel free from silting and scouring. This means the velocity is referred as
(A) Critical velocity
(B) Terminal velocity
(C) Scouring velocity
(D) Settling velocity

47. The time dependent deformation on soil is known as?
(A) Crack
(B) Creep
(C) Cut
(D) Condensation

48. What is the expression for toughness index (It) (where I_p, I_l and I_f are plasticity index, liquidity index and flow index respectively)?
(A) I_p/I_l
(B) I_l/I_f
(C) I_p/I_f
(D) I_f/I_p

49. CPM in project management stands for
(A) Critical Path Method
(B) Construction Planning & Management
(C) Control Project Management
(D) Construction Project Manpower

50. Which one of these is used for measurement of base line?
(A) Metric chain
(B) Invar tape
(C) Steel tape
(D) Engineer's chain

51. What is Compound curve?
(A) Two or more arcs of same radii meeting each other at common tangent point
(B) Two or more arcs of same radii meeting each other at initial tangent point
(C) Two or more arcs of different radii meeting each other at common tangent point
(D) Two or more arcs of different radii meeting each other at different tangent points

52. What will be the curve lead for a 1 in 8.5 turnout taking off from a straight B G track?
(A) 28.49 m
(B) 21.04 m
(C) 14.24 m
(D) 7.45 m

53. What is the least count of a vernier scale?
(A) Difference of the smallest division of main and vernier scales
(B) Sum of the smallest division of main and vernier scales
(C) Value of one division of vernier scale divided by the total number of division of primary scale
(D) Value of one division of primary scale divided by the total number of division of vernier scale

54. What will happen if there is upward migration of water table towards the capillary fringe and the atmospheric pressure falls to the freezing point?
(A) Frost Bulb
(B) Capillary Heave
(C) Frost Heave
(D) Capillary Bulb

55. What are the factors on which the calculation of the depth of foundation depends, as per Rankine's formula?
(A) Elasticity of soil, unit weight of soil & angle of repose
(B) Shear strength of soil, dry density & intensity of loading
(C) Plasticity of soil, dry density & intensity of loading
(D) Permissible pressure, unit weight of soil & angle of repose

56. While designing superelevation for mixed traffic conditions, the speed gets reduced by
(A) 25%
(B) 2%
(C) 15%
(D) 1%

57. At points and crossings, the total number of sleepers for 1 in 12 turnouts in broad gauge is
(A) 51
(B) 62
(C) 70
(D) 78

58. Which theorem states that, “In any beam the deflection at any point D due to load W at any other point C is same as the deflection at C due to the same load W applied at D”?
(A) Castigliano's theorem
(B) Conjugate Beam Theorem
(C) Strain Energy Theorem
(D) Maxwell's Reciprocal deflection theorem

59. It was found that the critical angle of a dam against seepage pressure with respect to normal was 45 degrees. According to Khosla creep theory, what can you say about the structure?
(A) The dam is stable against seepage pressure
(B) The dam is stable against overturning
(C) The dam is stable against lateral pressure
(D) The dam is stable against heave pressure

60. Hydraulic ram is used for lifting heavy vehicles or items. What is the principle behind the application of hydraulic ram?
(A) Pascal's law
(B) Bernoulli's law
(C) Newton's law
(D) Navier-Stoke's law

61. The Moody's chart is a logarithmic chart plotted against Darcy Weisbach friction factor and which one of the following parameters?
(A) Density of fluids
(B) Reynolds number
(C) Viscosity of the fluid
(D) Slope of the inclination of the fluid

62. In column analogy method, what is the area of an analogous column for a fixed beam of span 2L and flexural rigidity 2EI?
(A) L/EI
(B) L/2EI
(C) 2L/EI
(D) L/4EI

63. Ringelmann scale is used to
(A) Measure CO
(B) Measure SO_2
(C) Grade density of smoke
(D) Grade automobile exhaust gas

64. What shall be the maximum Bending Moment in a cantilever beam of span 4 m having uniformly distributed load of 2 KN/m?
(A) 8 KN.m
(B) 4 KN.m
(C) 16 KN.m
(D) 2 KN.m

65. Which condition applies for statically indeterminate beams?
(A) No. of equilibrium conditions are more than no. of reactions
(B) No. of reactions are more than no. of equilibrium conditions
(C) No. of reactions are equal to no. of equilibrium conditions
(D) No. Of reactions are more than no. of forces

66. What is the slope of A-line in the plasticity chart?
(A) 0.53
(B) 0.63
(C) 0.73
(D) 0.83

67. Which method in network analysis deals with uncertainties associated with the activities?
(A) PERT
(B) CPM
(C) Bar Chart
(D) Graph

68. Which network analysis method is more useful for the projects having fairly accurate estimate of time for completion?
(A) PERT
(B) Bar charts
(C) Graphs
(D) CPM

69. If a rectangular bar has been subjected to torsion, then maximum shear stress will occur
(A) At the centre
(B) At the corner
(C) At the middle of longer side
(D) Along the diagonal

70. Compared to a level surface, the stopping sight distance on a descending gradient is
(A) Less
(B) More
(C) Same
(D) Depends on the speed

71. In construction drawings, C_t is commonly referred as
(A) Compression tie
(B) Continuous tie
(C) Concrete tie
(D) Column tie

72. If the axial load carrying capacity of a column with lateral ties is PT and for column with spiral reinforcement is PS then as per IS 456:2000, how much more does PS have strength over PT?
(A) 1%
(B) 2%
(C) 3%
(D) 5%

73. Maximum value of 'throw of switch' for Broad gauge track is
(A) 89 mm
(B) 95 mm
(C) 100 mm
(D) 115 mm

74. In limit state design method, the limiting values of the depth of neutral axis for Fe 415 steel is given by which of the following equations?
(A) 0.53 d
(B) 0.48 d
(C) 0.46 d
(D) 0.36 d

75. If the stopping distance and average length of a vehicle are 18 m and 6 m respectively, then the theoretical maximum capacity of a traffic lane at a speed of 10 m/sec is
(A) 1000 vehicles/hr
(B) 1500 vehicles/hr
(C) 2000 vehicles/hr
(D) 3000 vehicles/hr

76. What is the dimension of dynamic viscosity?
(A) $ML^{-1}T^{-1}$
(B) MLT^{-1}
(C) $ML^{-1}T$
(D) MLT

77. In the Hill roads, if several alternate alignments are surveyed which fulfill the geometric standards, then the preferred alignment is the one which has resisting length as
(A) Maximum
(B) Minimum
(C) Very near to average resisting length of all the alignments
(D) Zero

78. The degree of saturation is a ratio between which of the following parameters?
(A) Volume of pores by volume of water
(B) Volume of water by volume of pores
(C) Volume of solids by volume of pores
(D) Volume of air by volume of pores

79. Scientific planning of transport system and mass transit facilities in cities is based on
(A) Spot speed data
(B) Origin and destination data
(C) Traffic volume data
(D) Accident data

80. The ratio of volumetric strain with compressive stress is defined as
(A) Fluid energy
(B) Force
(C) Compressibility
(D) Pressure

81. What is the Cardinal Principle of Surveying?
(A) Working from Whole to Part
(B) Working from Part to Whole
(C) Working from Part to Part
(D) Working from Whole to Whole

82. The depth of water standing for crop, during the time, the crop grows in the field is defined as
(A) Duty
(B) Crop ratio
(C) Delta
(D) Base period

83. Which of the following compounds is widely used for algae control?
(A) Sodium sulphate
(B) Copper sulphate
(C) Sodium chloride
(D) Calcium chloride

84. A pipe conveying domestic wastewater from plumbing fixtures of a single building to common sewer or point of immediate disposal is known as
(A) House sewer
(B) Lateral sewer
(C) Main sewer
(D) Sub main sewer

85. A critical path in PERT analysis is one which connects the events having slack as
(A) More than 1
(B) More than 2
(C) More than 3
(D) Zero

86. What shall be the maximum deflection in a simply supported beam of size 50 x 100mm & span 10 m having a point load 1 KN at the centre?
Assume E= 100000 N/sq.mm
(A) 60 mm
(B) 50 mm
(C) 70 mm
(D) 80 mm

87. The cross-sectional area of 52 kg flat-footed rail is
(A) 7235 mm^2
(B) 7825 mm^2
(C) 6615 mm^2
(D) 6155 mm^2

88. The Percentage of bacterial load that is removed through plain sedimentation is about
(A) 25
(B) 50
(C) 75
(D) 85

89. The permissible standards of air quality fixed in India for residential areas for SPM, SO_2, NO and CO in $\mu g/m^3$ respectively are
(A) 200, 80, 80, 2000
(B) 500, 120, 120, 5000
(C) 100, 30, 30, 1000
(D) 160, 80, 100, 10000

90. In Network Analysis the commencement or completion of an activity is called
(A) Time
(B) Duration
(C) Event
(D) Period

91. Which network analysis method is more useful for the projects of repetitive in nature?
(A) CPM
(B) PERT
(C) Bar Charts
(D) Mile Stone Charts

92. Slope deflection method can be used for analyzing which of the following?
(A) Statically determinate Structure
(B) Statically Indeterminate Structure
(C) Unstable Structure
(D) Simply Supported Structure

93. What shall be the maximum Shear force in a simply supported beam of span 3 m having a point load of 4 KN at the centre of the beam?
(A) 4 KN
(B) 2 KN
(C) 6 KN
(D) 8 KN

94. Estimate the value of k of a soil with an effective diameter of 0.2 mm.
(A) 0.5 cm/sec
(B) 0.05 cm/sec
(C) 0.05 mm/sec
(D) 0.57 mm/sec

95. The amount of residual chlorine left in treated water is about
(A) 0.01 to 0.05 ppm
(B) 0.05 to 0.5 ppm
(C) 0.5 to 1.0 ppm
(D) 1.0 to 2.0 ppm

96. The layout of distribution system which conveys water flow towards the outer periphery is
(A) Radial system
(B) Dead end system
(C) Ring system
(D) Grid iron system

97. Where will the capillary zone lie, if the water table is at a point 3.5 m from the ground level?
(A) 3.8 m
(B) 3.6 m
(C) 3.5 m
(D) 3.4 m

98. Grain size, viscosity, temperature and void ratio are the important factors influencing which of the following property of soil?
(A) Infiltration
(B) Seepage
(C) Permeability
(D) Porosity

99. How many poise is 1 Pascal-Second?
(A) 12
(B) 13
(C) 14
(D) 10

100. What is the expression of continuity equation for steady flow and incompressible flow?
(A) $d(\rho u/dx) + d(\rho v/dy) + d(\rho w/dz) + d\rho/dt = 0$
(B) $d(\rho u/dx) + d(\rho v/dy) + d(\rho w/dz) = 0$
(C) $\rho du/dx + \rho dv/dy + \rho dw/dz + dp/dt = 0$
(D) $du/dx + dv/dy + dw/dz = 0$

101. Enoscope is used to determine
(A) Spot speed
(B) Average speed
(C) Space-mean speed
(D) Time-mean speed

102. What shall be the moment required in a propped cantilever of span L to produce unit slope at the propped end, if E is young's modulus & I is the moment of inertia?
(A) 4EI/L
(B) 3EI/L
(C) 2EI/L
(D) EI/L

103. How many links are recommended in a 20 m Metric chain as per IS: 1492-1970?
(A) 75
(B) 100
(C) 50
(D) 25

104. To express sound levels in decibels, sound pressure levels are usually adopted on a reference scale of
(A) 10 μPa
(B) 20 μPa
(C) 50 μPa
(D) 100 μPa

105. The rate of BOD exerted at any time is
(A) Directly proportional to BOD satisfied
(B) Directly proportional to BOD remaining
(C) Inversely proportional to BOD satisfied
(D) Inversely proportional to BOD remaining

106. The shoulder provided along the road edge should be
(A) Rougher than the traffic lanes
(B) Smoother than the traffic lanes
(C) Of same colour as that of the pavement
(D) Of very low load bearing capacity

107. What will be the difference of level between point C & D if the Back sight & Fore sight at points C & D are 3.565 & 2.865 respectively?
(A) Fall of 0.700 m from C to D
(B) Rise of 1.700 m from C to D
(C) Rise of 0.700 m from C to D
(D) Fall of 1.700 m from C to D

108. What is the relation between modulus of rigidity (G), bulk modulus (K) and Poisson's ratio (μ)?
(A) $G=K(1-2\mu)/2(1+\mu)$
(B) $G=3K(1-2\mu)/2(1+\mu)$
(C) $G=3K(1-2\mu)/(1+\mu)$
(D) $G=3K(1-\mu)/2(1+\mu)$

109. Which of the following is NOT the displacement
(A) Slope deflection method
(B) Moment distribution method
(C) Kani's method
(D) Column analogy method

110. The formation width for a single line meter gauge track in embankment as adopted on Indian Railways is
(A) 4.27 m
(B) 4.88 m
(C) 5.49 m
(D) 6.10 m

111. What is the moisture depth available for evapo--transpiration in root zone of 1 m depth soil, if dry weight of soil is 1.5 gm/cc, field capacity is 35% and permanent wilting point is 15%?
(A) 450 mm
(B) 300 mm
(C) 200 mm
(D) 150 mm

112. What shall be the section modulus of a rectangular beam having width 2 m and depth 3 m?
(A) 6 cubic m
(B) 3 cubic m
(C) 18 cubic m
(D) 21 cubic m

113. For the construction of water bound macadam roads, the correct sequence of operation after spreading coarse aggregates is
(A) Dry rolling, wet rolling, application of screening and application of filler
(B) Dry rolling, application of filler wet rolling, and application of screening
(C) Dry rolling, application of screening, wet rolling, and application of filler
(D) Dry rolling, application of screening, application of filler and wet rolling

114. The maximum amount of time that an activity can be delayed without extending the completion time of the overall project is called:
(A) Duration
(B) Time Limit
(C) Float
(D) Critical path

115. Rigidity factor is defined as
(A) The product of contact pressure & tyre pressure
(B) The difference between contact pressure & tyre pressure
(C) The sum of contact pressure & tyre pressure
(D) The ratio of contact pressure to tyre pressure

116. The required slope correction for a length of 60 m along a gradient of 1 in 20 is
(A) 7.5 m
(B) 7.5 cm
(C) 0.75 cm
(D) 5.75 cm

117. Which is the correct sequence of jobs in construction management?
(A) Planning, Scheduling & Controlling
(B) Planning, Controlling & Scheduling
(C) Scheduling, Planning & Controlling
(D) Controlling, Planning & Scheduling

118. What is the use of orifice meter?
(A) Measure pressure
(B) Measure discharge
(C) Measure average speed
(D) Measure velocity

119. The frictional resistance caused by the shear force between fluid particles and boundary walls of the pipe as well as the viscosity of the fluid is called
(A) Minor loss
(B) Major loss
(C) Fringe loss
(D) Surface loss

120. Irrigation canals are aligned along with which of the following geographical feature?
(A) Straight line
(B) Valley line
(C) Contour line
(D) Ridge line

121. In CPM, the Earliest Finish Time (EFT) is calculated by
(A) Earliest start time + activity duration
(B) Activity duration - earliest start time
(C) Earliest start time - activity duration
(D) Earliest start time - latest finish time

122. The rail is designated by its
(A) Length
(B) Weight
(C) Cross-section
(D) Weight per unit length

123. Two important constituents in composition of steel used in rail are
(A) Carbon and Manganese
(B) Carbon and Sulfur
(C) Carbon and Silica
(D) Manganese and Phosphorus

124. Switch angle is the angle between
(A) The outer face of the stock rail and the gauge face of the tongue rail
(B) The outer face of the stock rail and tongue rail
(C) The gauge face of the stock rail and outer face of the tongue rail
(D) The gauge face of the stock rail and tongue rail

125. The distribution mains are designed for
(A) Maximum daily demand
(B) Maximum hourly demand
(C) Average daily demand
(D) Maximum hourly demand on maximum day

126. Which of the following is the Kennedy critical velocity equation?
(A) $V_o = 0.55\ m\ D^{0.64}$
(B) $V_o = 0.55\ m\ D^{0.56}$
(C) $V_o = 0.64\ m\ D^{0.56}$
(D) $V_o = 0.64\ m\ D^{0.64}$

127. What shall be the Quadrantal bearing, if the whole circle bearing is 112 degree?
(A) S 68 degree E
(B) N 112 degree S
(C) E 22 degree S
(D) N 258 degree S

128. The delta for a crop having base period of 100 days is 75 cm. What is the duty?
(A) 2304 hectare/cumec
(B) 1152 hectare/cumec
(C) 115.2 hectare/cumec
(D) 11.52 hectare/cumec

129. The hourly variation factor is usually taken as
(A) 1.5
(B) 1.8
(C) 2
(D) 2.7

130. If a canal runs parallel to road which has natural drain along its edges. Then the canal is defined as
(A) Aqueduct
(B) Syphon
(C) Syphon aqueduct
(D) Super passage

131. On a stressed body there are points on which shear stress is zero. These planes are known as
(A) Orthogonal planes
(B) Normal planes
(C) Shear planes
(D) Principal planes

132. Orifice meter uses which of the following principle/law for its operations?
(A) Pascal law
(B) Darcy's Law
(C) Bernoulli's law
(D) Newton's law

133. Tensile strength of steel used in rails should NOT be less than
(A) 850 Mpa
(B) 700 Mpa
(C) 500 Mpa
(D) 450 Mpa

134. For California Bearing Ratio test, the soil should be soaked for how many days?
(A) 2
(B) 2.5
(C) 4.5
(D) 4

135. The graphical pattern obtained by the intersection of stream lines and equipotential lines is defined as
(A) Flow net
(B) Flow lines
(C) Flow potential lines
(D) Flow stream lines

136. Certain key events in the life of a project are called:
(A) Dummies
(B) Critical events
(C) Nodes
(D) Milestones

137. What is the relation between Consumptive Irrigation Requirement (CIR), Net Irrigation Requirement (NIR), Field Irrigation Requirement (FIR) and Gross Irrigation Requirement (GIR)?
(A) CIR>FIR>GIR>NIR
(B) CIR>GIR>FIR>NIR
(C) GIR>FIR>CIR>NIR
(D) GIR>FIR>NIR>CIR

138. What is the most commonly used shape for a lined canal?
(A) Circular
(B) Parabolic
(C) Elliptical
(D) Trapezoidal

139. For water bound macadam roads in localities of heavy rainfall, the recommended value of camber is
(A) 1 in 30
(B) 1 in 36
(C) 1 in 48
(D) 1 in 60

140. In an activity, if the latest start time is 28 days & the earliest start time is 18 days then the total float shall be
(A) 46 days
(B) 10 days
(C) 14 days
(D) 9 days

141. The hydraulic gradient line is sum of which of the following terms?
(A) Pressure head, velocity head with respect to a reference line
(B) Pressure head, datum head with respect to a reference line
(C) Velocity head, datum head with respect to a reference line
(D) Pressure head with respect to a reference line

142. At a point in a strained material, if two mutually perpendicular tensile stresses of 200 N/mm^2 and 100 N/mm^2 is acting, then what will be the intensity of tangential stress on a plane inclined at 15^o to the axis of the minor stress?
(A) 12.5 Nmm^2
(B) 25 Nmm^2
(C) 350 Nmm^2
(D) 300 Nmm^2

143. During the survey of metro rail line, it was observed that a canal and drainage intersect at almost same level, while aligning the metro line from one point to another. What structure needs to be built for this feature?
(A) Inlet and outlet
(B) A syphon
(C) Aqueduct
(D) A level crossing

144. What is the name of the equation which makes a relationship with the value of loss of head in a pipe of length 'L' due to viscosity in laminar flow?
(A) Navier Stoke's equation
(B) Hagen Poiseuille equation
(C) Bernoulli equation
(D) Euler's equation

145. When an ascending gradient of 1 in 50 meets a descending gradient of 1 in 50, the length of summit curve for a stopping sight distance of 80 m will be
(A) Zero
(B) 64 m
(C) 60 m
(D) 80 m

146. Number of fish bolts per fish plate is
(A) 2
(B) 4
(C) 5
(D) 6

147. In project management PERT stands for
(A) Project Equipment & Revenue Technique
(B) Project Evaluation & Resource Technique
(C) Program Evaluation & Review Technique
(D) Program Estimate & Review Technique

148. Creep is the
(A) Lateral movement of rail
(B) Vertical movement of rail
(C) Longitudinal movement of rail
(D) Difference in level of two rails

149. The characteristics of fresh and septic wastewater respectively are
(A) Acidic and Alkaline
(B) Both acidic
(C) Alkaline and Acidic
(D) Both alkaline

150. In a project activity for completion, if the most optimistic time is 4 days, most likely time is 6 days & most pessimistic time is 11 days, then the Expected time shall be
(A) 5.5 days
(B) 6.5 days
(C) 8 days
(D) 7 days

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