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| **Question Booklet Number**<br>**22203276** | **QUESTION BOOKLET**<br>**PAPER – II (C02)** | **Question Booklet Series**<br>**D** |
| **This booklet contains 120 questions in 24 pages** | | **Maximum Marks : 360** |
| **Time Allowed :- 2:00 Hours (120 Minutes)** | | |

**Before answering the questions, read the instructions given below carefully.**

## IMPORTANT INSTRUCTIONS

1. The candidates are advised to check carefully the exam time allowed, Nos. of questions and maximum marks mentioned on the top of Booklet and also check the nos. of questions and marks section wise mentioned on the top of every section.
2. Immediately after the commencement of the examination, you should check that this **Question Booklet** does not have any unprinted or torn or missing pages or items, etc. If so, get it replaced by a **New Question Booklet** of the same discipline/post and series.
3. Encode clearly the **Question Booklet Series A, B, C or D** as the case may be in the appropriate place in the answer sheet.
4. The question paper for written examination shall be bilingual (English & Hindi) and the applicant will have the option to undertake the examination in either of the language. In case of discrepancy of questions in Hindi and English language, the English version shall prevail.
5. Use only **Black ink ball point pen** to write Name, Roll Number, Question Booklet No., signature and also to fill up ovals in the OMR Answer Sheet. Do not use pencil.
6. This examination is of objective type. All questions are mandatory in nature.
7. The Question-Booklet contains 120 questions. Each question carries ***three*** marks.
   **Every correct answer will get *three* marks and for every wrong answer *one* mark will be deducted.**
8. Each Question comprises four options (answers). You will have to select the correct option (answer) which you want to mark on the **OMR** Answer Sheet. **Choose ONLY ONE APPROPRIATE RESPONSE** for each objective type question.
9. OMR Answer sheet will be processed by electronic scanner. Any folding/stapling/putting stray remarks, not filling the ovals completely, doing rough work, may invalidate the OMR answer sheet and the same will be the responsibility of the candidate.
10. Rough Work is to be done in any blank space in the Question Booklet. No other papers will be allowed/provided.
11. Candidates are not allowed to carry any blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers, Wrist Watch and electronic gadgets in any form etc. to the Examination Hall. Any candidate found using, or in possession of such unauthorized material or involved in copying or impersonation or adopting unfair means or behaviours will be disqualified and may be subjected to penal action.
12. Please carefully go through the instructions given above and in the admit card before filling of the OMR Answer sheet.
13. The candidates are provided with three-layer carbon OMR Answer Sheet. They must submit the **Triplicate** copy to the **invigilator** and take the candidate's carbon copy *from the invigilator*, the candidates are permitted to take away the Question Booklet with them.

**Name of the candidate (in Capital letters) :** VIKRAM KUMAR RAWANI

**Roll Number (in figures) :**

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**Candidate's Signature :** Vikram Kumar Rawani

**Invigilator's Signature :** Sobha 3107

नोट : हिन्दी संस्करण का निर्देश इस पुस्तिका के पिछले आवरण पर छपा हुआ है।

1. Which joint is used for AC (Asbestos cement) pipes ?
(A) CID joint
(B) Flanged joint or Expansion joint
(C) Collar joints with Cement mortar
(D) None of the above

2. The meander pattern of a river is developed by
(A) Average or Critical discharge
(B) Dominant discharge
(C) Maximum discharge
(D) More than one of the above

3. For cereal crops the most commonly adopted method of irrigation is
(A) Free flowing method
(B) Furrow or Sprinkling method
(C) Check method
(D) None of the above

4. For reinforced concrete section the shape of shear stress diagram is
(A) Parabolic above neutral axis and rectangular below neutral axis
(B) Rectangular above neutral axis and parabolic below neutral axis
(C) Wholly parabolic or Wholly rectangular
(D) None of the above

5. The maximum surface drying time (min) for class A type plastic emulsion paint as per the Indian standards is :
(A) 240 (B) 45
(C) 60 (D) 75

6. Which properties of asbestos used for building construction is incorrectly stated ?
(A) It is incombustible
(B) It is a good conductor of electricity
(C) It is fire resistant
(D) It is rust free

7. The number of zones in India for classifying allowable moisture content for building timber as per the Indian Standard are :–
(A) Four (B) Six or five
(C) Three (D) Two or one

8. Percentage content of silica in window glass, is _____
(A) 85 to 90 (B) 45 to 55
(C) 55 to 60 (D) 70 to 75

9. Capacity of an irrigation tank depends on _____
(A) The topography of the land
(B) The population in that region
(C) Contour of the place
(D) Types of crop and duty

10. For a number of columns constructed in a row, the type of foundation provided is
(A) Footing
(B) Strip
(C) Raft and Strap
(D) More than one of the above

11. When the reservoir is full, the maximum compressive force in a gravity dam is produced
(A) At the toe
(B) At the heel or at centre of base
(C) Within the middle third of the base
(D) None of the above

12. A canal which is aligned at right angles to the contours is called
(A) Contour canal
(B) Branch canal
(C) Watershed canal
(D) None of the above

13. Which of the following is not a water borne disease?
(A) Dysentery and Malaria
(B) Cholera and Typhoid
(C) Malaria
(D) Typhoid and Dysentery

14. Turbidity is measured on
(A) Standard cobalt scale
(B) Standard platinum scale
(C) Standard silica scale
(D) Platinum cobalt scale

15. Water flows into a large tank with flat bottom at the rate of $0.7 \times 10^{-4} m^3 s^{-1}$. Water is also leaking out of a hole of area $0.5 cm^2$ at its bottom. If the height of the water in the tank remains steady, then the height is :

(A) 10.0 cm (B) 15.0 cm
(C) 5.0 cm (D) 7.5 cm

16. The torsional longitudinal reinforcement in RCC beams should be placed at _____

(A) Each corner of the beam
(B) Middle of each face
(C) Middle of the beam
(D) Both (B) and (C)

17. The variation of the hoop stress across the thickness of a thick cylinder is

(A) Ecliptic
(B) Linear
(C) Parabolic
(D) Hyperbolic

18. The tilt displacement in an aerial photograph is radial distance from _____

(A) Isocentric point
(B) Nadir point
(C) Principal point or Plumb point
(D) None of the above

19. For under-water construction _____ cement is used.

(A) Quick setting
(B) Ordinary Portland or expansive
(C) Portland Pozzolana
(D) More than one of the above

20. The thickness of a sharp crested weir is kept

(A) less than one-third of height of water on the sill
(B) less than one-half of height of water on the sill
(C) less than one-fourth of height of water on the sill
(D) less than two-third of height of water on the sill

21. The diagonal scale is used to represents _____?

(A) three consecutive units
(B) two consecutive units
(C) diagonal of square
(D) diagonal of rectangle

22. Centre lines, section lines are drawn using _____ Pencil

(A) H (B) 2H
(C) 3H or 4H (D) HB

23. A cantilever beam carries a uniformly distributed load (W) over its whole length (L) and a force (W) acts at its free end in the upward direction. What will be the net deflection of the free end?

(A) $\frac{5WL^3}{24EI}$ upward

(B) $\frac{3WL^3}{8EI}$ downward

(C) Zero

(D) $\frac{5WL^2}{24EI}$ upward

where E is the Young's modulus and I is the second moment of area about an axis passing through centroid

24. Nominal cover to RCC column of size 200 x 200 mm using 12 mm diameter longitudinal bars is _____.

(A) 25 mm (B) 15 mm
(C) 30 mm (D) None of the above

25. What should be the minimum compressive strength of First class bricks?

(A) 75 $kg/cm^2$
(B) 130 $kg/cm^2$
(C) 100 $kg/cm^2$
(D) 120 $kg/cm^2$

26. The crystallization test is performed on stones to find out its _____

(A) Durability
(B) Weather resistance
(C) Hardness and Specific gravity
(D) More than one of the above

27. In case of paints, the change characterised by an appreciable reduction in the initial flexibility, cohesion and adhesion at the film is formed as _____

(A) Brittleness (B) Rupture
(C) Viscosity loss (D) Fracture

28. Which type of flooring is suitable for use in churches, theatres, public libraries and other places where noiseless floor covering is desried ?
(A) Cork flooring
(B) Wooden flooring or Glass flooring
(C) Linoleum flooring
(D) More than one of the above

29. A device installed in a drainage system to prevent reverse flow is _____
(A) back water valve
(B) back-siphonage
(C) backflow preventer
(D) back-vent pipe

30. Alum when added as a coagulant in water
(A) Does not require alkalinity in water for flocculation
(B) Decreases pH value of water
(C) Increases pH value of water
(D) Does not affect pH value of water

31. Soundness of cement is tested by
(A) Vicat apparatus
(B) Hopper apparatus
(C) Le-Chatelier apparatus
(D) Izod apparatus

32. To the calculated area of cover plates of a built-up beam, an allowance for rivet holes to be added is _____
(A) 7% or 10% (B) 13%
(C) 15% or 18% (D) None of the above

33. A plate of rainfall intensity versus time is known as
(A) Mass flow curve
(B) Duration curve
(C) Hyetograph
(D) Unit hydrograph

34. The cavitation and pitting can be prevented by creating which one of the following conditions?
(A) Reducing the pressure head
(B) Reducing the velocity head
(C) Increasing the elevation head
(D) Reducing the piezo metric head

35. Hydraulic lime is obtained by
(A) Fly ash
(B) Burning of Kankar
(C) Red stone
(D) Calcination of Pure clay

36. For lime concrete _____
(A) Slump is 50 to 75 mm
(B) Flexural strength at 90 days is 0.2 $N/mm^2$
(C) Compressive strength at 90 days is 1.5 $N/mm^2$
(D) All options are correct

37. The permissible stress to which a structural member can be subjected to, is known as
(A) Bearing stress
(B) Effective stress
(C) Working stress
(D) None of these

38. The external wind pressure acting on a roof depends on
(A) Roughness of roof
(B) Degree of permeability of roof
(C) Slope of roof
(D) None of the above

39. In roof trusses the horizontal beam spanning between the two adjacent trusses are known as
(A) Principal rafter
(B) Common rafter
(C) Both (A) and (B)
(D) Purlin

40. Which properties is enhanced by Tetracalcium Alumina ferrite in cement?
(A) Flash setting
(B) Delay in setting
(C) Final setting
(D) None of the above

41. Desalination is usually done for _____
(A) Well water and Lake water
(B) Sea water
(C) River water or Lake water
(D) More than one of the above

42. Bitumen felt is used for
(A) water proofing
(B) damp proofing
(C) both (A) and (B)
(D) none of these

43. Acrylic sheets
(A) possess 10 to 17 times greater breakage resistance than that of glass of equivalent thickness
(B) are generally unaffected by most household ingredients
(C) possess the light transmission rate of 93%
(D) all the above

44. The deep structural members subjected to transverse loads are called
(A) Beam or Columns
(B) Plate girders
(C) Trusses and Beam
(D) Only Trusses

45. If the foundations of all the columns of a structure are designed on the total live and dead load basis, then
(A) There will be no settlements of columns
(B) There will be no differential settlement
(C) The settlement of interior columns will be more than exterior columns
(D) The settlement of exterior columns will be more than interior columns

46. A liquid of density $\rho$ is coming out of a hose pipe of radius 'a' with horizontal speed 'v' and hits a mesh. 40% of the liquid passes through the mesh unaffected. 30% looses all of its momentum and 30% comes back with the same speed. The resultant pressure on the mesh will be :
(A) $\frac{3}{4}\rho v^2$ (B) $\frac{9}{10}\rho v^2$
(C) $\frac{11}{8}\rho v^2$ (D) None of the above

47. The ultimate bearing capacity of a soil, is
(A) Total load on the bearing area
(B) Safe load on the bearing area
(C) Load at which soils fails
(D) Load at which soils consolidates

48. The type of pollution that gets increased during the day time and in the presence of $O_3$ is :
(A) Acid rain
(B) Oxidising smog
(C) Reducing smog
(D) Global warming

49. Hydrographic surveys deal with the mapping of
(A) Large water bodies
(B) Heavenly bodies
(C) Mountainous or Canal system
(D) None of the above

50. Steel of yield strength 450 MPa has been used in a structure. What is the value of maximum allowable tensile strength?
(A) 269.46 MPa
(B) 289.86 MPa
(C) 245.43 MPa
(D) None of the above

51. In a singly reinforced beam, the effective depth is measured from its compression edge to _____
(A) Tensile edge or Neutral axis of the beam
(B) Tensile reinforcement
(C) Longitudinal central axis
(D) More than one of the above

52. The shear stress between two fixed parallel plates with a laminar flow between them
(A) Varies hyperbolically across the gap
(B) Remains constant across the gap
(C) Varies directly as distance from the mid-plane
(D) Varies inversely as distance from the mid-plane

53. The amount of irrigation water required to meet the evapotranspiration needs of the crop during its full growth is called
(A) Net irrigation requirement
(B) Effective rainfall
(C) Consumptive use
(D) Consumptive irrigation requirement

54. The time interval for which the cement products remains in plastic condition is known as
(A) Final setting time
(B) Initial setting time
(C) Expansion time or Contraction time
(D) None of the above

55. Principle of surveying followed to prevent accumulation of error is :
(A) To work from whole to part
(B) To work from part to whole
(C) Both (A) and (B)
(D) None of the above

56. The process used for the removal of dissolved carbon dioxide from the supply water is
(A) Coagulation or Agitation
(B) Aeration
(C) Sedimentation
(D) More than one of the above

57. First class timber has an average life of
(A) less than 3 years
(B) 3 to 6 years
(C) 6 to 10 years
(D) more than 10 years

58. What is the unit weight of broken bricks ?
(A) $200 \times 10^3$ N/m$^3$
(B) $20 \times 10^3$ N/m$^3$
(C) $14.2 \times 10^3$ N/m$^3$
(D) $142 \times 10^3$ N/m$^3$

59. Which technique of water distribution in farms is also called trickle irrigation ?
(A) Border flooding
(B) Sprinkle irrigation
(C) Drip irrigation
(D) Free flooding

60. Critical speed of a turbine is
(A) Speed at which natural frequency of vibrations equals the number of revolutions in the same time
(B) Speed that will cause mechanical failure of the shaft
(C) Speed equal to synchronous speed of the generator
(D) Same as run away speed

61. The specific speed, $N_s = \frac{N \times \sqrt{Q}}{H^{3/4}}$ for a double suction pump is to be evaluated the discharge would be taken as _____
(A) Square of the actual discharge
(B) Half the actual discharge
(C) Actual or Double the actual discharge
(D) None of the above

62. According to IS : 800-1962 the permissible bending stress in steel slab plates, is _____
(A) 1500 kg/mm$^2$
(B) 1420 kg/cm$^2$
(C) 2125 kg/mm$^2$
(D) 1890 kg/cm$^2$

63. Expansion joints are provided if the length of concrete structures exceeds _____
(A) 10 m
(B) 45 m
(C) 5 m
(D) None of the above

64. The type of steel used for precision levelling staff is
(A) Titanium steel
(B) Carbon steel or Stainless steel
(C) Invar
(D) More than one of the above

65. Deflection limitations over beams are imposed because excessive deflection may cause
(A) Undesirable twisting and distortion of end connections
(B) Problems in drainage system and Psychological effect on users
(C) Both (A) and (B)
(D) None of the above

66. When surface of transpiration is submerged under water, then potential evapotranspiration is
(A) Equal to or less than evapotranspiration
(B) Much more than evapotranspiration
(C) Much less than evapotranspiration
(D) Equal to evapotranspiration

67. Surveys which are carried out to provide a national grid of control for preparation of accurate maps of large areas are known as
(A) Plane surveys or Geographical surveys
(B) Topographical surveys
(C) Geodetic surveys
(D) None of the above

68. In chain surveying a tie line is primarily provided
(A) To increase the number of chain lines
(B) To take offsets for detail survey
(C) To check the accuracy of the survey
(D) To avoid long offset from chain lines

69. Theodolite is an instrument used for
(A) Tightening the capstan–headed nuts of level tube
(B) Measurement of horizontal angles or vertical angles
(C) Measurement of horizontal and vertical angles
(D) None of the above

70. Plywood is obtained by gluing wooden sheets at a pressure of _____.
(A) 100 to 150 $N/cm^2$
(B) 100 to 130°C
(C) Neither (A) nor (B)
(D) More than one of the above

71. Cohesive soils
(A) Gain shear strength on wetting
(B) Lose shear strength on wetting
(C) Become inelastic on wetting
(D) Decrease in shear strength on wetting

72. The best method of interpolation of contours, is by
(A) Estimation
(B) Computation
(C) Graphical means
(D) More than one of the above

73. The latitude of a traverse leg is obtained by multiplying its length by _____
(A) Cosine of its reduced bearing
(B) Tangent of its reduced bearing
(C) Sine of its reduced bearing
(D) Cosecant of its reduced bearing

74. Where is the tacheometer usually adopted for surveying?
(A) direct levelling places
(B) Plain surfaces and direct levelling places
(C) direct chaining places
(D) Difficult terrain places

75. Sensitivity of a soil can be defined as _____
(A) Ratio of volume of voids to volume of solids
(B) Percentage of volume change of soil under saturated condition
(C) Ratio of compressive strength of unconfined undisturbed soil to that of soil in a remoulded state
(D) None of the above

76. Pickup the explosive used for tunnelling in soft rock from the following
(A) Blasting gelatin
(B) Special gelatin
(C) Ammonia dynamite
(D) Semi-gelatin

77. The normal size of ballast used for points and crossings is
(A) 12 mm (B) 35 mm
(C) 15 mm (D) 25 mm

78. Cross – staff is used for _____
(A) Taking levels
(B) Measuring contours
(C) Measuring distance
(D) Setting out right angles

79. Profile levelling is usually for the determining
(A) Contours of an area
(B) Elevations along a straight line
(C) Boundaries of property
(D) Capacity of a reservoir

80. In flow through a pipe, the transition from laminar to turbulent flow does not depend on
(A) Velocity and density of the fluid
(B) Diameter of the fluid
(C) Length of the fluid
(D) More than one of the above

81. The depth of flow for maximum velocity in a circular channel section with diameter equal to 1.5 m is
(A) 0.750 m (B) 1.215 m
(C) 1.500 m (D) None of these

82. If there are n pipes of same diameter d, laid in parallel in place of a single pipe of diameter D, then
(A) $d = \frac{D}{n^{5/2}}$ (B) $n = \left(\frac{D}{d}\right)^{5/2}$
(C) $D = \frac{d}{n^{2/5}}$ (D) $n = \left(\frac{d}{D}\right)^{5/2}$

83. Which of the following unit works in anaerobic conditions?
(A) Sludge digestion tank
(B) Sedimentation tank or Trickling filters
(C) Activated sludge treatment
(D) More than one of the above

84. The biochemical treatment of sewage effluents is essentially a process of
(A) Oxidation and Reduction
(B) Reduction and Dehydration
(C) Dehydration and Alkalinization
(D) Oxidation

85. The compressibility of clays, is caused due to
(A) Bending of particles as elastic sheets
(B) Slipping of particles to new positions of greater density
(C) Expulsion of double layer water from in between the grains
(D) All of the above

86. For a loose sand sample and a dense sand sample consolidated to the same effective stress
(A) Ultimate strength is same but peak strength of dense sand is greater than that of loose sand
(B) Ultimate strength is same but peak strength of loose sand is greater than that of dense sand
(C) Ultimate strength is same and also peak strength is same
(D) Ultimate strength is different but peak strength is same

87. The compression index of a soil
(A) Decreases with an increase in the liquid limit
(B) Increases with an increase in the liquid limit
(C) Decreases with an increase in the plastic limit
(D) Is not at all related with plastic limit

88. The activity of clay is equal to
(A) Reaction of clay with alkali salts
(B) Rate of flow of clay at optimum moisture content
(C) Ratio of the percentage of the plasticity index to the percentage of the clay fraction
(D) Ratio of the natural water content minus the plastic limit to the liquid limit minus the plastic limit

89. If the natural water content of a soil mass lies between its liquid limit and plastic limit, the soil mass is said to be in
(A) Liquid state
(B) Solid state
(C) Plastic state
(D) Semi–solid state

90. According to the classification of ordinary Portland cement by Indian Standard Bureau which of the following is not a grade of cement?
(A) Grade 53 and Grade 43
(B) Grade 33 and Grade 43
(C) Grade 33
(D) Grade 63

91. The bulk density of cement is :
(A) 1.62 (B) 1.44
(C) 1.21 (D) 1.68

92. For coastal protection works such as break-water and tetrapod, which of the following types of cement is advisable?
(A) Portland Pozzolona
(B) Low heat and Ordinary Portland cement
(C) Sulphate resisting cement
(D) None of the above

93. What is the type of bond which gets developed due to variation of bending moment along the beam ?
(A) Development bond
(B) Anchorage bond
(C) Flexural bond
(D) More than one of the above

94. What is the span to depth ratio for simply supported deep beam ?
(A) < 2.0 (B) < 2.5
(C) < 3.5 (D) = 1.4

95. Before testing the setting time of cement one should test its _____
(A) Soundness
(B) Consistency
(C) Fineness
(D) Strength

96. What is the minimum water-cement ratio required for full hydration of cement?
(A) 0.24
(B) 0.36
(C) 0.46
(D) 0.55

97. Bottommost layer of pavement is known as:
(A) wearing course
(B) base course
(C) sub-base course
(D) subgrade

98. A hydraulic jump occurs at the top of spillway. The depth before jump is 0.275 m. The sequent depth is 2.275 m. What is the energy dissipated in _____ 'm' (approximately)?
(A) 10.79 m
(B) 15.50 m
(C) 22.53 m
(D) none of these

99. As per IS 456:2000 the maximum area of steel in compression in beams is equal to:
(A) 0.02bD (B) 0.15bD
(C) 0 .03bD (D) 0.04bD

100. For a hydraulically efficient rectangular channel of bed width 5.0 m, the depth of flow and hydraulic radius is:
(A) 0.5 m, 1.25 m
(B) 2.5 m, 1.25 m
(C) 1 m, 2.5 m
(D) 3.5 m, 2.5 m

101. The wind load on a steel truss for an industrial building will depend upon
(A) Only location of the structure
(B) Only shape of the structure
(C) Only height of the structure
(D) More than one of the above

102. The ratio of the diameter of reinforcement bars and the slab thickness is:
(A) 1 : 8 (B) 1 : 12
(C) 1 : 2 (D) 1 : 4

103. What does the bitumen of grade 80/100 means?
(A) Its penetration value is 6 to 8 mm
(B) Its penetration value is 10 mm
(C) Its penetration value is 8 to 10 mm
(D) Its penetration value is 8 to 10 cm

104. As per Indian Road Congress, what should be the camber on cement concrete road?
(A) 1 in 60 to 1 in 50
(B) 1 in 50 to 1 in 40
(C) 1 in 12 to 1 in 16
(D) 1 in 12 to 1 in 24

105. A shaft turns at 300 rpm under torque of 1500 Nm. The power transmitted by shaft is
(A) 52.1 kW
(B) 47.1 kW
(C) 42.7 kW
(D) (1.5 x 3.14) kW

106. The ratio of volume of air voids to the volume of voids, is known as _____
(A) Air content
(B) Porosity and Percentage voids
(C) Percentage voids
(D) Percentage air voids

107. If the hydraulic gradient is unity, then the ratio of flow across unit area of soil is called
(A) Coefficient of permeability
(B) Coefficient of discharge
(C) Coefficient of seepage
(D) Coefficient of viscosity

108. The general requirement in constructing a reinforced concrete road is to place a single layer of reinforcement _____
(A) Near the bottom of the slab
(B) Near the top of the slab
(C) At the middle
(D) Equally distributed at the top and the bottom

109. In which of the following traffic signal systems are the cycle length and cycle division automatically varied?
(A) Simultaneous system
(B) Alternate system
(C) Simple progressive system
(D) Flexible progressive system

110. To mop-clean a floor, a cleaning machine presses a circular mop of radius R vertically down with a total force F and rotates it with a constant angular speed about its axis. If the force F is distributed uniformly over the mop and if coefficient of friction between the mop and the floor is $\mu$, the torque, applied by the machine on the mop is :
(A) $\mu$ FR/2
(B) $\mu$ FR/6
(C) 2FR/3
(D) 2 $\mu$ FR/3

111. The building stone can be dressed very easily :
(A) after seasoning
(B) any time
(C) after some month of quarrying
(D) Just after quarrying

112. The coefficient of hardness of stones used in road work should be greater than _____
(A) 8 (B) 11
(C) 13 (D) 17

113. In case of rain water is discharged into sewer, it is connected before _____
(A) manhole
(B) chamber or bend
(C) gully trap
(D) none of the above

114. The moment of inertia of a uniform semi-circular disc of mass 10 kg and radius 2 m about a line perpendicular to the plane of the disc through the centre is
(A) 25 kg $m^2$
(B) 30 kg $m^2$
(C) 20 kg $m^2$
(D) 15 kg $m^2$

115. When tested for 7 days as per I.S. 4031, the heat of hydration of low heat Portland cement shall not be more than _____
(A) 55 cal/g
(B) 95 cal/g
(C) 35 cal/g
(D) 65 cal/g

116. A compression member has a centre to centre length of 6.0 m. It is fixed at one end and hinged at the other end. The effective length of column is

(A) 4.8 m
(B) 3.6 m
(C) 5.4 m
(D) 2.4 m

117. It is common practice to design a highway to accommodate the traffic volume corresponding to :

(A) ADT
(B) Peak hour
(C) $30^{th}$ hour
(D) 15 min-peak period

118. Which one of the following equipments is useful in determining spot speed in traffic engineering?

(A) Enoscope
(B) Periscope and Tachometer
(C) Radar, Periscope or Tachometer
(D) None of the above

119. In turbulent flows through rough pipes, the ratio of the maximum velocity to the mean velocity is

(A) Dependent on the friction factor
(B) 4/3
(C) 1.1 or 2
(D) None of these

120. The delta for a crop having base period 130 days is 65 cm. What is the duty?

(A) < 1715 hectare/cumec
(B) (1715 < duty < 1728) hectare/cumec
(C) > 1730 hectare/cumec
(D) = 1728 hectare/cumec