BKB

PROVISIONAL ANSWER KEY

Name of the post	**Assistant Engineer (Civil), Class-2, Gandhinagar Municipal Corporation**
Advertisement No.	**30/2024-25**
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THE LINK FOR ONLINE OBJECTION SYSTEM WILL START FROM 19-01-2025; 10:00 AM ONWARDS

Instructions / સૂચના

Candidate must ensure compliance to the instructions mentioned below, else objections shall not be considered: -

(1) Candidates have to pay fees of Rs.100/- for each objection. The fees can be paid from the link given herewith.

(2) The Candidate will be able to submit objection only after payment of the fees. The generation of the receipt will only be considered as final submission.

(3) The Candidate must retain the receipt of the payment of the fees. The fees, once paid, will not be refunded under any circumstances.

(4) All the objections should be submitted through **ONLINE OBJECTION SUBMISSION SYSTEM** only. Physical or submission through any other means will not be considered.

(5) All objections are to be submitted with reference to the Master Question Paper published with provisional answer key, published herewith on the website / online objection submission system. Objections should be sent referring to the Question No. & options of the Master Question Paper. Objections regarding question nos. and options other than provisional answer key (Master Question Paper) shall not be considered.

(6) Objections and answers suggested by the candidate should be in compliance with the responses given by him in his answer sheet. Objections shall not be considered, in case, if responses given in the answer sheet /response sheet and submitted objections are differed.

(7) Supportive document to the objection must be uploaded, without which objection will not be considered.

ઉમેદવારે નીચેની સૂચનાઓનું પાલન કરવાની તકેદારી રાખવી, અન્યથા વાંધા-સૂચન અંગે કરેલ રજૂઆતો ધ્યાને લેવાશે નહીં

(1) ઉમેદવારે દરેક વાંધા દીઠ રૂપિયા ૧૦૦/-ફી ભરવાની રહેશે. જે ફી આ સાથે આપેલ લીંક ઉપરથી ભરી શકાશે.

(2) ફી ભર્યા બાદ જ વાંધો સબમીટ થઈ શકશે. ફી ભર્યાની આખરી પહોંચ જ આખરી સબમીશન ગણાશે.

(3) ફી ભર્યાની પહોંચ ઉમેદવારે સાચવી રાખવાની રહેશે. એક વાર ભરેલ ફી કોઈ પણ પરિસ્થિતિમાં પરત આપવામાં આવશે નહિ.

(4) વાંધા ફક્ત **ઓનલાઈન ઓબ્જેકશન સબમીશન સીસ્ટમ** દ્વારા જ સબમીટ કરવાના રહેશે. રૂબરૂ, ટપાલ અથવા ઈ-મેઈલ કે અન્ય કોઈ રીતે આયોગને મોકલવામાં આવેલ વાંધા ધ્યાને લેવામાં આવશે નહીં, જેની ખાસ નોંધ લેવી.

(5) ઉમેદવારે પોતાને પરીક્ષામાં મળેલ પ્રશ્નપુસ્તિકામાં છપાયેલ પ્રશ્નક્રમાંક મુજબ વાંધા-સૂચનો રજૂ ન કરતાં, તમામ વાંધા-સૂચનો વેબસાઈટ પર પ્રસિધ્ધ થયેલ પ્રોવિઝનલ આન્સર કી (માસ્ટર પ્રશ્નપત્ર) ના પ્રશ્નક્રમાંક મુજબ અને તે સંદર્ભમાં રજૂ કરવા. માસ્ટર પ્રશ્નપત્રમાં નિર્દિષ્ટ પ્રશ્ન અને વિકલ્પ સિવાયના વાંધા ધ્યાને લેવામાં આવશે નહીં.

(6) ઉમેદવારે પ્રશ્નના વિકલ્પ પર વાંધો રજૂ કરેલ છે અને વિકલ્પ રૂપે જે જવાબ સૂચવેલ છે એ જવાબ ઉમેદવારે પોતાની ઉત્તરવહીમાં આપેલ હોવો જોઈએ. ઉમેદવારે સૂચવેલ જવાબ અને ઉત્તરવહીનો જવાબ ભિન્ન હશે તો ઉમેદવારે રજૂ કરેલ વાંધા ધ્યાને લેવાશે નહીં.

(7) વાંધા માટે સંદર્ભ જોડવો આવશ્યક છે, જેના વિના વાંધો ધ્યાને લેવામાં આવશે નહીં.

Website link for online objection submission system: https://www.formonline.co.in/GPSC_TRACK/SearchPage.aspx

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1. Which of the following failure theories is useful for Brittle materials?

(A) Maximum principal stress theory

(B) Maximum shear stress theory

(C) Maximum total strain energy theory

(D) Maximum distortion energy theory

2. When a square element in the strained material is subjected to two equal tensile stresses of 30 N/mm^2 each in x and y directions without any shear stress, the radius of Mohr's stress circle will be _____.

(A) zero

(B) 60

(C) 30

(D) 15

3. In a theory of bending of straight beams, neutral axis is the axis where _____.

(A) bending stress is maximum

(B) shear stress is minimum

(C) bending stress is zero

(D) shear stress is zero

4. Modulus of rigidity of material is defined as

(A) shear stress / shear strain

(B) normal stress / normal strain

(C) volumetric stress / volumetric strain

(D) bending stress / bending strain

5. Poisson's ratio is defined as the ratio of _____.

(A) linear strain to lateral strain

(B) shear strain to normal strain

(C) lateral strain to linear strain

(D) tensile strain to compressive strain

6. A rectangular bar of width b and depth d is being used as a cantilever beam. The loading is parallel to width b. The section modulus required to calculate the bending stress in this beam is _____.

(A) $bd^3/12$

(B) $bd^2/6$

(C) $db^2/6$

(D) $db^3/12$

7. If the bolt is subjected to shear force P and if the bolt is in double shear, then the shear stress induced in the bolt of cross-sectional area A will be _____.

(A) 2P/A

(B) P/A

(C) P/(2A)

(D) 1.5P/A

8. Under torsion test, brittle material specimen fails due to _____.

(A) pure shear

(B) diagonal tension

(C) diagonal compression

(D) diagonal shear

9. Ductility of material is measured in terms of _____.

(A) tensile stress

(B) compressive stress

(C) shear stress

(D) percentage elongation

10. The bending stress in a beam _____ to bending moment.

(A) is inversely proportional

(B) is directly proportional

(C) is equal

(D) is not related

11. Vertical fall at a point in the bending moment diagram of a beam shows _____.

(A) point load at that point

(B) zero shear force at that point

(C) couple at that point

(D) sudden change of flexural rigidity of beam at that point

12. A cantilever beam of length L is subjected to a point load P at its free end. If the length of beam is made 2L, then rotation (slope) at the free end will _____. (Assume other parameters as constant)

(A) decrease by 4 times

(B) decrease by 3 times

(C) increase by 4 times

(D) remain same

13. If a simply supported beam of span L is subjected to clockwise couple M at its left-end support, the bending moment at a distance x from left end support will be _____. (Consider hogging bending moment as negative)

(A) M / x

(B) –M . x / L

(C) –M . x / L + M

(D) M . x / L

14. In a cantilever beam of span L and subjected to clockwise couple M at its free end, the shear force at a distance x from fixed support is _____ .

(A) M / L
(B) M . x / L
(C) 2M / L
(D) zero

15. For buildings carrying imposed load greater than 3 kN/m^2, the percentage of imposed load considered for calculation of seismic weight of building is

(A) 20%
(B) 30%
(C) 50%
(D) 25%

16. In a moment distribution method, the sum of distribution factor of all the members meeting at a joint is

(A) zero
(B) less than 1
(C) 1
(D) greater than 1

17. Fixed end moment M_A for the fixed beam AB of length L subjected to uniformly distributed load w is

(A) $wL^2/16$
(B) $wL^2/8$
(C) $wL^2/4$
(D) $wL^2/12$

18. Maximum ordinate of influence line diagram for bending moment at a section 4m from left end support of a simply supported beam of 10m span is _____.

(A) 0.4
(B) 2.4
(C) 0.6
(D) 1

19. A fixed beam AB is subjected to a triangular load varying from zero at end A to w per unit length at end B. The ratio of fixed end moment at B to that at A will be

(A) 1/2
(B) 1/3
(C) 2/3
(D) 3/2

20. Bentonite is a material which forms due to weathering of

(A) limestone
(B) quartzite
(C) volcanic ash
(D) shales

21. According to IS classification, the particle size range for silt is

(A) 4.76 mm to 2.0 mm
(B) 2.0 mm to 0.425 mm
(C) 0.425 mm to 0.075 mm
(D) 0.075 mm to 0.002 mm

22. A clay sample has a void ratio 0.54 in dry state. The specific gravity of soil solids is 2.7. What is the shrinkage limit of the soil?

(A) 8.5%
(B) 10%
(C) 17%
(D) 20%

23. A soil has a liquid limit of 38% and plasticity index of 15%. The plastic limit of the soil will be

(A) 23%
(B) 53%
(C) 4%
(D) 30.5%

24. When the compactive effort is increased in a standard compaction test, the Optimum Moisture Content (OMC)

(A) decreases
(B) increases
(C) does not change
(D) is unpredictable

25. Why are sheep foot rollers more effective in compacting clayey soil?

(A) There is differential expulsion of water under the roller
(B) Roller speed is high
(C) Contact pressure is high
(D) Drum width is large

26. The coefficient of permeability increases when

(A) the viscosity of fluid increases
(B) the viscosity of fluid decreases
(C) the temperature condition decreases
(D) the length of sample decreases

27. Capillary rise is maximum for

(A) coarse grained soils
(B) fine grained soils
(C) well graded soils
(D) gap graded soils

28. The Swedish circle method used in stability analysis of slope was first introduced by

(A) Fellenius
(B) Mohr
(C) Beltrami
(D) von Mises

29. For fully saturated soil mass, the Skempton's pore pressure parameter B is

(A) nearly zero

(B) nearly 0.5

(C) nearly 1

(D) nearly infinite (∞)

30. In the friction circle method, the radius of the friction circle is given by

(A) r tanϕ (B) r cosϕ

(C) r sinϕ (D) r

31. Multi-underreamed piles are generally provided in

(A) Non-expansive clayey soil

(B) Sandy soil

(C) Expansive clayey soil

(D) Gravelly sandy soil

32. Partial safety factor for concrete and steel are 1.5 and 1.15 respectively, because

(A) concrete is heterogeneous while steel is homogeneous

(B) concrete is weak in tension

(C) voids in concrete are 0.5% while those in steel are 0.15%

(D) quality control of concrete is not as good as that of steel

33. The main reinforcement of a reinforced concrete slab (125 mm thick) consists of 10 mm bars at 100 mm spacing. If it is desired to replace 10 mm bars by 12 mm bars, then the theoretical spacing of 12 mm bars would be

(A) 122 mm (B) 165 mm

(C) 155 mm (D) 144 mm

34. The maximum depth of neutral axis for a beam of effective depth d in limit state method of design for Fe415 steel is

(A) 0.38d (B) 0.446d

(C) 0.48d (D) 0.53d

35. Doubly reinforced beams are recommended when

(A) the breadth of the beam is restricted

(B) the depth of the beam is restricted

(C) the span of the beam is restricted

(D) the shear is high

36. Permissible shear stress in reinforced concrete is a function of

(A) grade of concrete only

(B) grade of steel only

(C) percentage of steel only

(D) percentage of steel and grade of concrete

37. Lateral ties in reinforced concrete columns are provided to resist

(A) bending moment

(B) shear

(C) both bending moment and shear

(D) buckling of longitudinal steel bars

38. While designing combined footing, the resultant of the column loads passes through the center of gravity of the footing slab such that the net soil pressure obtained is

(A) parabolic

(B) trapezoidal

(C) sinusoidal

(D) uniform

39. The critical section for punching shear of isolated reinforced concrete footing is at a distance of _____ from the face of column. (d is the effective depth of footing)

(A) d

(B) d/4

(C) d/2

(D) 2d

40. Which one of the following is the correct statement about reinforced concrete cantilever retaining wall ?

(A) toe slab and heel slab are provided with reinforcements at top face

(B) toe slab and heel slab are provided with reinforcement at bottom face

(C) toe slab is provided with reinforcement at top face and heel slab at bottom face

(D) toe slab is provided with reinforcement at bottom face and heel slab at top face

41. What is the allowable total upward deflection in a prestressed concrete member under serviceability limit state condition?

(A) span/180

(B) span/300

(C) span/350

(D) span/450

42. For residential or commercial building having occupancy of more than 200 persons, the Importance factor (I) as per IS 1893: 2016 is

(A) 1.1

(B) 1.3

(C) 1.2

(D) 1.5

43. If a nominal diameter of bolt is 20 mm, then diameter of bolt hole for standard clearance hole as per IS 800: 2007 is

(A) 25 mm
(B) 20 mm
(C) 22 mm
(D) 30 mm

44. For a laterally unsupported steel beam, the design bending strength M_d is the function of

(A) design axial compressive stress
(B) design bending compressive stress
(C) design bending tensile stress
(D) design axial tensile stress

45. The effective slenderness ratio of battened column is taken more than maximum actual slenderness ratio of a column to account for _____.

(A) axial deformation effects
(B) shear deformation effects
(C) flexural deformation effects
(D) torsional deformation effects

46. For calculating design strength in tension of a steel plate governed by rupture of net cross-sectional area, the material safety factor used is

(A) 1.25
(B) 1.1
(C) 1.35
(D) 1.5

47. Shear lag width for single angle tension member connected through only one leg by welded connection is equal to the

(A) width of outstanding leg
(B) width of connected leg
(C) width of outstanding leg + width of connected leg
(D) width of outstanding leg – width of connected leg

48. Maximum effective slenderness ratio (KL/r) for a member carrying compressive loads resulting from dead loads and imposed loads is

(A) 250
(B) 350
(C) 400
(D) 180

49. In block shear strength of tension member,

(A) only shear strength is considered
(B) only tensile strength is considered
(C) only flexural strength is considered
(D) both tensile and shear strengths are considered

50. In a roof truss, the purlins are designed for

(A) uniaxial bending

(B) biaxial bending

(C) compression

(D) tension

51. The standard project flood is

(A) greater than probable maximum flood by a factor implying safety factor

(B) less than probable maximum flood

(C) less than ordinary flood

(D) none of the above

52. The duty is largest

(A) on the field

(B) at the head of water course

(C) at the head of a main canal

(D) same at all places

53. The amount of irrigation water required to meet the evapotranspiration needs of the crop during its full growth is called

(A) effective rainfall

(B) consumptive use

(C) net irrigation requirement

(D) consumptive irrigation requirement

54. Which of the following types of rain gauges is used for measuring rain in remote hilly inaccessible areas?

(A) weighing type

(B) tipping bucket type mean

(C) floating type

(D) Simon's rain gauge

55. Lysimeter is used to measure

(A) infiltration

(B) evaporation

(C) vapour pressure

(D) evapotranspiration

56. The unit hydrograph of a specified duration can be used to evaluate the hydrograph of storms of

(A) same duration only

(B) same and shorter duration

(C) any duration

(D) same and longer duration

57. For a flood control reservoir, the effective storage is equal to

(A) useful storage – valley storage

(B) useful storage + surcharge storage

(C) useful storage + surcharge storage – valley storage

(D) useful storage + surcharge storage + valley storage

58. Which of the following spillways is least suitable for an earthen dam?

(A) chute spillway

(B) ogee spillway

(C) side channel spillway

(D) shaft spillway

59. Which of the following canal structures is used to remove surplus water from an irrigation channel into a natural drain?

(A) canal fall

(B) canal escape

(C) canal outlet

(D) canal regulator

60. If the R.L. of canal bed level and high flood level of drainage are 212.0 m and 210.0 m respectively, then cross drainage work will be

(A) aqueduct

(B) super passage

(C) syphon

(D) syphon aqueduct

61. Cross-regulators in main canals are provided to

(A) regulate water supply in the offtaking channel

(B) regulate water supply in the main channel

(C) regulate excessive flood water

(D) head up water for adequate supply into the offtaking channel

62. Permanent wilting point is

(A) a characteristic of the plant

(B) a soil characteristic

(C) a soil characteristic modified by the crop

(D) dependent on soil water plant fertilizer interaction

63. The intensity of irrigation means

(A) percentage of gross commanded area to be irrigated annually

(B) percentage of culturable commanded area to be irrigated annually

(C) percentage of the mean of culturable commanded area and the gross commanded area to be irrigated annually

(D) total depth of water supplied by the number of waterings

64. The best alignment for a canal is when it is aligned along

(A) Valley line

(B) Contour line

(C) Stream line

(D) Ridge line

65. Canal drops are required to

(A) Dissipate excess energy

(B) Dissipate inadequate land slope

(C) Dissipate excess land slope

(D) None of the above

66. A unit hydrograph has one unit of

(A) peak discharge

(B) rainfall duration

(C) direct runoff

(D) the time base of direct runoff

67. The volume of water that can be extracted by force of gravity from a unit volume of aquifer material is called

(A) specific retention

(B) specific yield

(C) specific storage

(D) specific capacity

68. A hyetograph is a graph representing

(A) rainfall volume with time

(B) rainfall intensity with time

(C) rainfall intensity with duration

(D) rainfall intensity over an area

69. Irrigation efficiency of an irrigation system/water use is the ratio of

(A) Water actually stored in root zone to water delivered to the farm

(B) Water reaching the farm to water delivered from the source

(C) Water actually utilized by growing crops to water delivered from the source

(D) Crop yield to total amount of water used in a field

70. Conjunctive use of water in a basin means

(A) combined use of water for irrigation and for hydropower generation

(B) combined use of surface and groundwater resources

(C) combined water demand of industry and irrigation

(D) use of irrigation water by cooperative of farmers

71. The 'safety valve' of a dam is its

(A) Drainage gallery

(B) Inspection gallery

(C) Spillway

(D) Outlet sluices

72. Canal normally used for diversion of flood water of a river is _____

(A) Feeder canal

(B) Inundation canal

(C) Ridge canal

(D) Contour canal

73. Terra cotta in buildings is used for

(A) wall construction

(B) ornamental work

(C) sewage lines

(D) sanitary services

74. The impact tests are used to determine _____.

(A) ultimate crushing strength

(B) toughness

(C) ductility

(D) tenacity

75. A concrete having a slump of 6.5 cm is said to be

(A) dry

(B) earth moist

(C) semi-plastic

(D) plastic

76. The lime which contains mainly calcium oxide and slacks with water is

(A) fat lime

(B) hydraulic lime

(C) quick lime

(D) poor lime

77. Bulking of sand is caused due to

(A) viscosity

(B) surface moisture

(C) air voids

(D) clay contents

78. Rebound hammer also known as surface hardness test is used to find _____ of Concrete

(A) Hardness

(B) Compressive strength

(C) Workability

(D) Thickness

79. The type of bond in which every course contains both headers and stretchers is called

(A) Flemish bond

(B) English bond

(C) Dutch bond

(D) Mixed bond

80. The term King Post is related to

(A) Brick masonry

(B) Stone masonry

(C) Arch

(D) Roof

81. The vertical member running through the middle of a shutter frame is

(A) style

(B) mullion

(C) reveal

(D) post

82. The window which is provided on a sloping roof of a building is called

(A) Bay window

(B) Dormer window

(C) Louvered window

(D) Lantern window

83. Asphalt tank method is used for

(A) Plumbing

(B) Damp proofing

(C) Sound insulation

(D) Formwork

84. Cofferdam constructed when the depth of water is about 3 metres

(A) single-walled

(B) rockfill

(C) crib

(D) cellular

85. Kinematic viscosity is defined as equal to

(A) dynamic viscosity × density

(B) dynamic viscosity/density

(C) dynamic viscosity pressure

(D) pressure × density

86. Fluid statics deals with

(A) viscous and pressure forces

(B) viscous and gravity forces

(C) gravity and pressure forces

(D) surface tension and gravity forces

87. Gauge pressure at a point is equal to

(A) absolute pressure minus atmospheric pressure

(B) vacuum pressure plus absolute pressure

(C) absolute pressure plus atmospheric pressure

(D) none of the above

88. Continuity equation deals with the law of conservation of

(A) mass

(B) energy

(C) momentum

(D) internal energy

89. When the pipes are connected in series, the total rate of flow

(A) is equal to the sum of the rate of flow in each pipe

(B) is equal to the reciprocal of the sum of the rate of flow in each pipe

(C) is the same as flowing through each pipe

(D) none of the above.

90. Kinematic similarity between model and prototype means

(A) the similarity of shape

(B) the similarity of forces

(C) the similarity of motion

(D) the similarity of discharge.

91. Thickness of Boundary layer can be classified with

(A) Reynolds number (B) Froude number

(C) Mach number (D) Euler number.

92. If the fluid particles move in parallel lines, the flow is _____

(A) steady (B) uniform

(C) laminar (D) compressible

93. If the velocity in a fluid flow changes with respect to length of direction of flow, it is called

(A) compressible flow (B) irrotational flow

(C) unsteady flow (D) steady flow.

94. Model analysis of free surface flows are based on

(A) Reynolds number

(B) Froude number

(C) Euler number

(D) Mach number

95. Most economical section is one which for a given cross-sectional area, slope of bed and co-efficient of resistance has

(A) maximum wetted perimeter

(B) maximum depth of flow

(C) maximum discharge

(D) none of the above.

96. The specific energy in an open channel corresponding to the critical depth is

(A) zero
(B) minimum
(C) maximum
(D) None of the above

97. If the Froude number for a hydraulic jump is 5.2, the type of jump is _____

(A) Oscillating jump
(B) Steady jump
(C) Strong jump
(D) Weak jump

98. If the Reynolds number in pipe flow is 2200, the flow is

(A) Laminar
(B) Turbulent
(C) Transition
(D) Uniform

99. The losses in open channel vary as proportional to _____

(A) velocity (V)
(B) V^2
(C) V^1/2
(D) V^4

100. The hydraulic mean depth for a circular pipe of diameter (d) is

(A) d/2
(B) d/3
(C) d/4
(D) d/6

101. If the speed of the traffic stream increases, then the minimum spacing of vehicles

(A) Increases
(B) Decreases
(C) First increases then decreases after reaching a maximum value at optimum speed
(D) First decreases then increases after reaching a minimum value at optimum speed

102. If the average center-to-center spacing of vehicle is 40 meter, then the traffic volume of a traffic lane at a speed of 50 kmph is _____

(A) 2000 vehicles per hour
(B) 1250 vehicles per day
(C) 1250 vehicles per hour
(D) 2000 vehicles per day

103. Bitumen grade VG 30 indicates that under the standard test condition, absolute viscosity value of bitumen as per IS 73 would vary from _____

(A) 2400 poise to 3600 poise
(B) 2000 poise to 4000 poise
(C) 2500 poise to 3500 poise
(D) 20 poise to 40 poise

104. Which of the following criteria is not correct for Marshal Mix design for Dense graded Bituminous Mix design as per IRC guidelines?

(A) Stability 9 kN minimum

(B) Flow 8-10 mm

(C) VFB 65%-75%

(D) Air voids 3%-5%

105. The value of lateral friction or side friction used in the design of horizontal curve as per IRC guideline is

(A) 0.40 (B) 0.35

(C) 0.24 (D) 0.15

106. The load sustained by a remolded soil specimen at 5.0 mm penetration is 205 kg during CBR test. So, the CBR value of soil is

(A) 10% (B) 5.0%

(C) 4.0% (D) 15%

107. Road roughness is measured using which of the following instrument?

(A) Benkelman beam

(B) Fifth Wheel Bump integrator

(C) Dynamic cone penetrometer

(D) Falling weight deflectometer

108. As per the IRC 67-2012, a traffic sign indicating the speed limit on a road should be of

(A) Circular shape with white Background and red border

(B) Circular shape with red Background and white border

(C) Triangular shape with white Background and red border

(D) Triangular shape with red Background and white border

109. For the flexible pavement design as per IRC 37-2018, vertical compressive strain is considered critical at

(A) Top of bituminous wearing course

(B) Bottom of bituminous wearing course

(C) Top of subgrade layer

(D) Any point in the pavement section

110. The effect of grade on safe overtaking sight distance is to

(A) Increase it on descending grades and to decrease it on ascending grades

(B) Increase it on both descending and ascending grades

(C) Decrease it on both descending and ascending grades

(D) Decrease it on descending grades and to increase it on ascending grades

111. Which of the following is taken into consideration while determining overtaking sight distance for two-lane two-way highway?

(A) Distance covered during reaction time

(B) Distance covered during overtaking operation

(C) Reaction distance plus overtaking distance

(D) Distance covered during reaction time plus distance covered during operation plus the distance covered by the opposite traffic

112. As per IRC 383, the maximum utilization of recycled concrete aggregate as coarse aggregate when used in plain cement concrete is

(A) 25%

(B) 50%

(C) 75%

(D) 100 %

113. The level difference between level of the crown of bridge at its lowest point (formation level) and high flood level is known as

(A) Rail Level

(B) Free Board

(C) Bed Level

(D) Danger Level

114. What type of bridge is known for its long, uninterrupted spans and is often used for crossing wide bodies of water?

(A) Cable Stayed Bridge

(B) Arch Bridge

(C) Truss Beam

(D) Beam Bridge

115. When the path travelled along the road surface is more than the circumferential movement of the wheels due to rotation is known as

(A) slipping

(B) skidding

(C) turning

(D) revolving

116. For bridge construction, the afflux at site for a contracted water stream width can be computed by

(A) Unwin's formula

(B) Broad-crested weir formula

(C) Orifice formula

(D) Molesworth formula

117. From the following, the best-suited wing wall for bridge constructed to a wide river is

(A) Straight wing wall

(B) Splayed wing wall

(C) Return wing wall

(D) C-shaped wing wall

118. From the following, which is the vertical load considered for the design of a well foundation for bridge construction?

(A) Buoyancy

(B) Wind force

(C) Earth pressure

(D) Centrifugal force

119. The type of surveying in which curvature of the earth is taken into account is called

(A) Plane Surveying

(B) Preliminary Surveying

(C) Geodetic Surveying

(D) Topographical Surveying

120. From the following lines, which is not a fundamental line of transit theodolite?

(A) Axis of plate levels and bubble line of telescope

(B) Vertical axis

(C) Horizontal axis

(D) True Bearing line

121. The height of instrument in leveling survey is the

(A) Height of telescope above the ground at the time of observation

(B) Height of leveling staff

(C) Elevation of plane of collimation

(D) Sum of reduced level of BM and foresight

122. Which of the following statements best defines a level surface?

(A) A horizontal surface, every element of which is normal to plumb line

(B) A curved surface, every element of which is perpendicular to the spheroidal shape of the earth

(C) A plane surface which is perpendicular at all points to the direction of gravity

(D) A curved surface which is perpendicular to the direction of gravity at every point

123. If the coordinates of A are 150 N and 250 E and those of C are 150 S and 250 E, then the length of AC is

(A) 300 (B) 200

(C) 280 (D) 400

124. If standard meridian is 82°30' E and standard time at longitude 90° E is known to be 8 hr 30 min, then corresponding local mean time at the place will be

(A) 7 hr 00 min (B) 8 hr 00 min

(C) 8 hr 30 min (D) 9 hr 00 min

125. The Sun's electromagnetic radiation which is reflected by different objects is received by sensors on satellite to create image is known as

(A) Passive remote sensing

(B) Active remote sensing

(C) Neutral remote sensing

(D) Positive remote sensing

126. Which one of the following statements is not correct for GIS technology?

(A) It is the same as traditional mapping

(B) It is a tool box for processing maps and fundamental concepts for spatial measurements

(C) It contains analytic capabilities for overlaying map

(D) It is capable to study the environmental surroundings

127. The altitudinal distance of a geostationary satellite from the earth is about

(A) 26000 km (B) 30000 km

(C) 36000 km (D) 44000 km

128. The Sun-synchronous satellites have which of the following orbit?

(A) Polar orbit (B) Circular orbit

(C) Equatorial orbit (D) Geostationary orbit

129. Which of the following rocks has a significant stratification?

(A) Igneous rocks

(B) Metamorphic rocks

(C) Sedimentary rocks

(D) Fossil rocks

130. Which of the following are the two conditions thought to be necessary for igneous rock formation?

(A) Low temperature and molten state

(B) Molten state and very high temperature

(C) Molten state and moderate temperature

(D) Crystallised state and moderate temperature

131. If sandstone is the original rock, then what is metamorphic rock?

(A) Slate

(B) Gneiss

(C) Quartzite

(D) Marble

132. The study of rocks to analyse and discuss their texture, mineral composition, mode of occurrence and geographical distribution is called as

(A) Hydrogeology

(B) Mineralogy

(C) Petrology

(D) Geomorphology

133. In measuring of the wall plaster, no deduction is made for opening upto

(A) 1 sq.m

(B) 1.5 sq.m

(C) 0.5 sq.m

(D) 0.01 sq.m

134. As guarantee of a tender, some amount to be deposited with tender is known as

(A) Down payment

(B) Earnest money

(C) Security deposit

(D) Caution money

135. The brick work is not measured in cu m in case of

(A) Half Brick Wall

(B) One and Half Brick wall

(C) Damp proof course

(D) Honey comb brickwork

136. In long and short wall method of estimation, the length of long wall is from out-to-out and length of short wall is measured

(A) In-to-in of long walls

(B) Out-to-out of short wall

(C) Center-to-center of short wall

(D) In-to-in of center of long walls

137. The shortest possible time in which an activity can be achieved under ideal circumstances is known as

(A) Pessimistic time estimate

(B) Optimistic time estimate

(C) Expected time estimate

(D) The most likely time estimate

138. The difference between the maximum time available and the actual time needed to perform an activity is known as

(A) Free float

(B) Independent float

(C) Total float

(D) Half float

139. The project management tool "PERT" stands for

(A) Program Evaluation Rate Technology

(B) Program Evaluation Robot Technique

(C) Program Evaluation Robot Technology

(D) Program Evaluation Review Technique

140. When the activity time for the critical activity is crash(decrease), then which of the following statement is true?

(A) decreasing the direct cost and increasing the indirect cost

(B) increasing the direct cost and decreasing the indirect cost

(C) increasing both the direct cost and indirect cost

(D) decreasing both the direct cost and indirect cost

141. In PERT analysis, the time estimates of activities and probability of their occurrence follow

(A) Normal Distribution curve

(B) Poisson's Distribution curve

(C) Beta Distribution curve

(D) Delta Distribution

142. From the following, which type of disputes can be referred to arbitration?

(A) Lunacy Proceedings

(B) Insolvency Proceedings

(C) Matter of criminal nature

(D) Contract interpretation and performance

143. Which one of the following methods of tunnelling is used in hard rock?

(A) Forepoling method

(B) Needle Beam method

(C) Heading and benching method

(D) American method

144. From the following, the most suitable soil for compression air tunnelling is

(A) Sand

(B) Gravel

(C) Water bearing soil

(D) Hard soil

145. Which one of the following is a component of a shield for tunnelling?

(A) Liner plate

(B) Trench jack

(C) Stiffener

(D) Cutting edge

146. Tunnel ventilation can be carried out by

(A) General Ventilation

(B) Natural Ventilation

(C) Mechanical ventilation

(D) Both natural and mechanical ventilation

147. What is the maximum speed limit recommended in a school access zone as per IRC guideline in urban area?

(A) 25 kmph

(B) 40 kmph

(C) 50 kmph

(D) 30 kmph

148. The minimum flexural strength of pavement quality concrete as per IRC to be considered for a design is

(A) 4.5 MPa

(B) 3.5 MPa

(C) 2.0 MPa

(D) 2.5 MPa

149. To stabilize the river channel along a certain alignment with certain cross section is known as

(A) River network

(B) River diverts

(C) River training

(D) River rafting

150. Which of the following is the first principle of surveying?

(A) Whole to whole

(B) Part to part

(C) Part to whole

(D) Whole to part

151. Which of the following is included in 'demand for public use'?

(A) Water requirement of shopping mall

(B) Water requirement for watering of public park

(C) Water requirement of public school

(D) Water requirement of textile industry

152. For a city with population of 1,21,000 persons, fire demand as per CPHEEO manual formula is calculated as

(A) 1100 kilo liters/d

(B) 1100 m^3/h

(C) 110 kilo liters/d

(D) 110 m^3/h

153. Municipal supply of water for a city of population 2,00,000 persons is 36000 m^3/d. The per capita supply level is

(A) 18 $m^3/C/d$

(B) 200 L/C/d

(C) 200 $m^3/C/d$

(D) 180 L/C/d

154. A general value of design period for a water supply project is

(A) 35 years with time lag of 2 to 5 years between design and completion of the project

(B) 30 years with time lag of 2 to 5 years between design and completion of the project

(C) 20 years with time lag of 5 to 10 years between design and completion of the project

(D) 35 years with time lag of 5 to 10 years between design and completion of the project

155. In which type of tubewell, wire mesh is wrapped around perforated pipe?

(A) Cavity type tubewell

(B) Slotted pipe type tubewell

(C) Strainer type tubewell

(D) Deep well

156. Turbidity measurement for water on nephelometric turbidity meter is based on

(A) Scattering of light by the sample

(B) Absorption of light by the sample

(C) Reflection of light by the sample

(D) Refraction of light by the sample

157. An odorous water sample is diluted to standard 200 mL volume with odour-free water to the level at which odour is barely detectable. At that point the volume of odorous water is 40 mL. What is the threshold odour number (TON) of that water?

(A) 8

(B) 5

(C) 50

(D) 40

158. Temporary hardness in water is caused by

(A) Carbonate and bicarbonate of calcium and magnesium

(B) Chloride and sulphate of calcium and magnesium

(C) Carbonates and bicarbonates of sodium and potassium

(D) Chlorides and sulphates of sodium and potassium

159. Which of the following pipes has a long life of about 100 years?

(A) Cast Iron pipes

(B) Plastic pipes

(C) Steel pipes

(D) RCC pipes

160. Which is not used as coagulant in the treatment of water?

(A) Aluminum sulphate

(B) Copper sulphate

(C) Sodium aluminate

(D) Ferric sulphate

161. Which does not remove permanent hardness in water?

(A) Lime-soda process

(B) Base-exchange process

(C) Boiling

(D) Reverse osmosis

162. During the epidemics of water-borne disease, high dose of chlorine is applied beyond break point is termed as

(A) Pre-chlorination

(B) Post-chlorination

(C) Super-chlorination

(D) Dechlorination

163. Which is the correct relation among the following?

(A) Dissolved solid = Total solid + Suspended solid

(B) Dissolved solid = Total solid – Suspended solid

(C) Total solid = Dissolved solid / Suspended solid

(D) Dissolved solid = Suspended solid – Total solid

164. Which of the following treatment is used for the removal of taste, odour and colour in water?

(A) Sedimentation

(B) Coagulation

(C) Filtration

(D) Adsorption

165. How much acidic is the sample of pH 3 compared to pH 6?

(A) 3 times

(B) 10^3 times

(C) 2 times

(D) 10^{-3} times

166. Surface loading rate of a sedimentation tank is measured in which unit?

(A) $m^3/m/day$

(B) L/day

(C) $m^3/m^2/day$

(D) mg/L

167. Design flow for the distribution mains of a water supply system is calculated by considering

(A) Maximum daily demand

(B) Average daily demand

(C) Peak demand (Absolute maximum hourly demand)

(D) Maximum hourly demand

168. There are two waters with pH value of 7.5 and 5.5. Coagulation of both these waters was carried out by alum as a coagulant. In which of the water, coagulation is more effective?

(A) Water with pH 7.5

(B) Water with pH 5.5

(C) Water with pH 6.5

(D) No effect of pH

169. Choose the correct sequence in descending order regarding efficiency of disinfection

(A) Chlorine gas > Bleaching powder > Chloramines

(B) Chloramines > Bleaching powder > Chlorine gas

(C) Chlorine gas > Chloramines > Bleaching powder

(D) Chloramines > Chlorine gas > Bleaching powder

170. Combined sewers are designed to collect and convey

(A) Domestic sewage and industrial wastewater

(B) Domestic sewage and sullage

(C) Sanitary sewage and storm water

(D) Sanitary sewage and groundwater infiltration

171. What will be the average rate of sewage flow, if the average rate of water supplied is 200 LPCD?

(A) 200 LPCD (B) 100 LPCD

(C) 210 LPCD (D) 160 LPCD

172. Analysis of a wastewater sample is established BOD/COD ratio as 0.7. Which of the following is true in this context?

(A) Wastewater is toxic

(B) Wastewater is biodegradable

(C) Wastewater is inert

(D) Wastewater is non-biodegradable

173. The removal of oil and grease from sewage takes place in

(A) Grit chamber (B) Skimming tank

(C) Detritus tank (D) Sedimentation tank

174. Which unit works on the principle of anaerobic decomposition?

(A) Activated sludge process

(B) Oxidation pond

(C) Septic tank

(D) Trickling filter

175. The sludge of secondary sedimentation tank containing very high population of active bacterial mass is known as

(A) Sludge cake (B) Leachate

(C) Activated sludge (D) Coagulant

176. Secondary settling tank _____

(A) reduces pH of wastewater (B) removes pathogens

(C) removes biomass (D) removes dissolved solids

177. _____ is the velocity at which the solid matter in sewage remains in suspended form in sewer.

(A) Settling velocity (B) Self-cleansing velocity

(C) Mean velocity (D) Non-scouring velocity

178. Which of the following biological treatment unit is not a suspended growth process?

(A) Activated Sludge Unit

(B) Aerated Lagoon

(C) Oxidation pond

(D) Trickling filter

179. The best sewer material to resist hydrogen sulphide corrosion is

(A) R.C.C.

(B) Brick masonry

(C) Glazed stoneware

(D) Asbestos cement

180. When a sewer line is dropped below the hydraulic gradient line to pass it below some obstruction, the arrangement is known as

(A) Inverted siphon

(B) Cleanout pipe

(C) Sag pipe

(D) Catch basin

181. The main constituents of gas generated during anaerobic digestion of sludge:

(A) Carbon dioxide and methane

(B) Methane and Sulphur dioxide

(C) Carbon monoxide and Nitrogen

(D) Ammonia and Carbon monoxide

182. Symbiosis, the beneficial association between algae and bacteria is used for the treatment of waste water in which of the following unit?

(A) Activated sludge

(B) Rotating Biological Disc

(C) Anaerobic digester

(D) Oxidation pond

183. The drop manholes are provided in a sewerage system when

(A) branch sewer connects to the main sewer manhole at more than 90^{o} angle

(B) branch sewer connects to the main sewer of more than 1.5 m diameter

(C) branch sewer connects to the main sewer manhole above 0.6 m height

(D) gravity flow branch sewer connects to the pressurized main sewer

184. BOD removal efficiency of primary settling tank of sewage treatment plant is normally

(A) 10 % to 20 %

(B) 30 % to 35 %

(C) 50 % to 60 %

(D) 70 % to 80 %

185. A single rapid test to determine the pollution status of river water is

(A) biochemical oxygen demand

(B) chemical oxygen demand

(C) total organic solids

(D) dissolved oxygen

186. Corrosion of concrete sewers occurs due to

(A) high velocity of flow of sewage

(B) aerobic decomposition of sewage and settled solids

(C) anaerobic decomposition of sewage and settled solids

(D) high pH value of sewage

187. In which of the following refuse disposal method, reclaimed area is obtained?

(A) Composting

(B) Disposal by dumping in sea

(C) Incineration

(D) Sanitary Landfilling

188. All non-putrescible solid waste except ashes is called

(A) Rubbish

(B) Garbage

(C) Sullage

(D) Sewage

189. In anaerobic composting of solid waste value of C/N (carbon-nitrogen) ratio should be

(A) 10 to 20

(B) 30 to 50

(C) 5 to 10

(D) 60 to 80

190. Shredders are used to

(A) reduce bulky refuse items to a manageable size for waste disposal

(B) reduce size of waste by the action of chemicals

(C) oxidise the organic constituents of waste

(D) segregate the organic and metal

191. Which one of the following solid waste disposal methods is suitable for the processing of biodegradable waste in residential premises?

(A) Sanitary landfill

(B) Incineration

(C) Composting

(D) Pyrolysis

192. Leachate is a dark coloured liquid that comes out of

(A) Septic tank

(B) Sanitary landfill

(C) Compost plant

(D) Aerated lagoon

193. Which of the following is the secondary air pollutant?
(A) Ozone
(B) Sulphur dioxide
(C) Carbon monoxide
(D) Suspended particulate matter

194. The primary pollutant which is formed due to incomplete combustion of organic matter is
(A) Carbon monoxide
(B) Carbon dioxide
(C) Sulphur dioxide
(D) Ozone

195. The temperature gradient of ambient air is called
(A) Environmental lapse rate
(B) Adiabatic lapse rate
(C) Dry adiabatic lapse rate
(D) Super adiabatic lapse rate

196. In an atmosphere under super-adiabatic lapse rate conditions, the emission from a chimney produces a plume described as
(A) coning
(B) lofting
(C) looping
(D) fumigation

197. Which one of the following pair is liquid particulates?
(A) Dust and mist
(B) Mist and fog
(C) Smoke and spray
(D) Fly ash and fumes

198. Maximum height of Sardar Sarovar Dam above the deepest foundation level:
(A) 156.5 m
(B) 163.00 m
(C) 174 .2 m
(D) 138.4 m

199. Which state has the highest share of irrigation water from Sardar Sarovar Project?
(A) Rajasthan
(B) Gujarat
(C) Madhya Pradesh
(D) Maharashtra

200. Sabarmati Ashram at Ahmedabad is associated with which freedom movement?
(A) Dandi March
(B) Khilafat Andolan
(C) Quit India Movement
(D) Non-cooperation Movement
