Sl. No. : 40000077

CIDI 2012

Register Number | | | | | | | | |

2012
CIVIL ENGINEERING
(Diploma Standard)

Time Allowed : 3 Hours] **[Maximum Marks : 300**

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains **200** questions.
3. Answer **all** questions.
4. **All** questions carry equal marks.
5. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.
6. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers. You must write your Name, Register No., Question Booklet Sl. No. and other particulars with Blue or Black ink Ball point pen on side 1 of the Answer Sheet provided, failing which your Answer Sheet will not be evaluated.
7. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, your Answer Sheet will not be evaluated.
8. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case, you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
9. In the Answer Sheet there are **four** brackets [A] [B] [C] and [D] against each question. To answer the questions you are to mark with Ball point pen ONLY ONE bracket of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong *e.g.* If for any item, [B] is the correct answer, you have to mark as follows :

   [A] ■ [C] [D]

10. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.
11. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
12. Do not tick-mark or mark the answers in the Question booklet.
13. The last sheet of the Question Booklet can be used for Rough Work.

SEAL

1. For a material, the relationship between the Young's Modulus (E), Shear Modulus (G) and Poisson's Ratio (H) is given by

(A) $G = \frac{E}{2(1 + H)}$ (B) $E = \frac{G}{2(1 + H)}$

(C) $G = \frac{E}{(1 + 2H)}$ (D) $G = \frac{E}{2(1 - H)}$

2. Direct stress induced in a rectangular beam is calculated as

(A) $\frac{P}{AE}$ (B) $\frac{P}{A}$

(C) $\frac{P}{L}$ (D) $\frac{P}{\delta L}$

3. The resistance offered by a body against the External Force is called

(A) Strength (B) Elasticity

(C) Stress (D) Strain

4. The ratio of the decrease in length to the original length is called

(A) Compression (B) Compressive Stress

(C) Compressive Strain (D) Compressive Strength

5. A simply supported beam is subjected to a uniformly distributed of w/m throughout the entire length of the beam. The maximum bending moment will be equal to

(A) $wl/8$ (B) $wl/4$

(C) $\frac{wl^2}{8}$ (D) wl

6. The point of contraflexure can exist in a

(A) simply supported beam (B) cantilever beam

(C) overhanging beam (D) None of the above

7. In SI units, unit for section modulus is

(A) N/m^2 (B) mm^2

(C) mm^3 (D) mm^4

8. The centroid of a Triangular lamina having base b and height h is

(A) 2h/3 from apex (B) h/2 from apex

(C) h/3 from apex (D) 4h/3 from apex

9. Moment of inertia of a circle about vertical axis is

(A) $\frac{\pi D^3}{16}$ (B) $\frac{\pi D^3}{32}$

(C) $\frac{\pi D^4}{64}$ (D) $\frac{\pi D^4}{32}$

10. Polar moment of inertia is

(A) the moment of inertia of an area about an axis parallel to centroidal axis

(B) equal to moment of inertia

(C) the moment of inertia of an area about an axis perpendicular to the plane of the area

(D) None of the above

11. When a member is subjected to a twisting moment, the material will be subjected to

(A) shear stresses (B) axial compression

(C) axial tension (D) bending stresses

12. A beam is a structural member predominantly subjected to

(A) transverse loads (B) axial forces

(C) twisting moment (D) None of the above

13. The unit of bending stress in rectangular beam is

(A) N/mm (B) N/mm^2

(C) Nm (D) kN.m

14. The section modulus Z of a rectangular section having breadth b, depth d is

(A) $Z = \frac{bd^3}{12}$ (B) $Z = \frac{bd^3}{6}$

(C) $Z = \frac{bd^2}{6}$ (D) $Z = \frac{bd^2}{4}$

15. The axial stress resulting from axial force which tends to elongate a member is called as

(A) Axial stress (B) Direct stress

(C) Tensile stress (D) Elongation

16. In SI units, unit for stress is

(A) N.mm (B) N/mm^2

(C) N/m^2 (D) N.m

17. The number of unknown reaction components for a simply supported beam carrying point load at its centre is

(A) 0 (B) 4

(C) 3 (D) 2

18. The section modulus of a rectangular section b × d is

(A) $\frac{bd^3}{12}$ (B) $\frac{bd^2}{6}$

(C) $\frac{bd^3}{3}$ (D) $\frac{bd^3}{6}$

19. The centre of gravity of a semi-circular lamina lies on the central radius at a distance of

(A) $\frac{4r}{3\pi}$ from base diameter (B) $\frac{3r}{8}$ from base diameter

(C) $\frac{8r}{3}$ from base diameter (D) none of the above

20. The units of moment of inertia of area are

(A) kg-m^3 (B) N.mm

(C) mm^4 (D) mm^3

21. Polar moment of inertia of a solid circular section is

(A) $\frac{\pi D^4}{64}$ (B) $\frac{\pi D^4}{32}$

(C) $\frac{\pi D^3}{32}$ (D) $\frac{\pi D^3}{64}$

22. Torsional Rigidity is

(A) EI (B) GI_p

(C) EQ (D) Z

23. A body will be in equilibrium when

(A) the algebraic sum of vertical components of all forces is zero

(B) the algebraic sum of horizontal components of all forces is zero

(C) the algebraic sum of moments of all forces about a point is zero

(D) All the above

24. A frame, which has got less number of members than given by the formula ($n = 2j - 3$) is called as a

(A) perfect frame
(B) deficient frame
(C) redundant frame
(D) none of the above

25. The number of available static equilibrium equations are

(A) 0
(B) 1
(C) 2
(D) 3

26. A cantilever beam of length l carries point load W at free end. The deflection at fixed end is

(A) $\delta = \frac{Wl^3}{EI}$
(B) $\delta = \frac{Wl^3}{2EI}$
(C) $\delta = \frac{Wl^3}{4EI}$
(D) $\delta = 0$

27. Area moment theorem is also known as

(A) Eddy's theorem
(B) Mohr's theorem
(C) Maxwell's theorem
(D) Newton's IIIrd law

28. By applying Mohr's theorem I, we can determine the

(A) Bending moment at a point
(B) Shear force at a point
(C) Slope at a point
(D) Deflection at a point

29. The stiffness factor at the near end of a member with far end fixed is

(A) $\frac{4EI}{l}$
(B) $\frac{3EI}{l}$
(C) $\frac{EI}{l}$
(D) EI

30. A portal frame is a

(A) Indeterminate structure
(B) Determinate structure
(C) Solid structure
(D) None of the above

31. The slenderness ratio is the ratio between

(A) length and diameter of column
(B) effective length and radius of gyration of column
(C) 2 times effective length
(D) none of the above

32. The Euler's critical formula for columns with both ends fixed is

(A) $P = \frac{\pi^2 EI}{l^2}$ (B) $P = \frac{4\pi^2 EI}{l^2}$

(C) $P = \frac{2\pi^2 EI}{l^2}$ (D) $P = \frac{\pi^2 EI}{4l^2}$

33. As per Rankine's formula, the crippling load is given by

(A) $P = \frac{f_c A}{1 + a(l)^2}$ (B) $P = \frac{f_c A}{1 + a(l/r)^2}$

(C) $P = \frac{f_c A}{1 + \left(\frac{l}{r}\right)^2}$ (D) $P = \frac{f_c A}{1 + a^2(l/r)}$

34. The maximum stress induced in the eccentrically loaded column is

(A) $\frac{W}{l}\left(1 + \frac{6e}{b}\right)$ (B) $\frac{W}{l^2}\left(1 + \frac{6e}{b}\right)$

(C) $\frac{W}{l}\left(1 + \frac{6b}{e}\right)$ (D) $\frac{W}{A}\left(1 + \frac{6e}{b}\right)$

35. For a rectangular column, the minimum eccentricity to avoid tension is

(A) e = 6 (B) e = b/2

(C) e = b/4 (D) e = b/6

36. The unit for Euler's Crippling load in S.I. units is

(A) Kg (B) Kg.m

(C) N (D) N.m

37. Which of the following represents the Bending Moment at a section ?

(A) $EI\frac{d^4y}{dx^4}$ (B) $EI\frac{d^3y}{dx^3}$

(C) $EI\frac{d^2y}{dx^2}$ (D) $EI\frac{dy}{dx}$

38. A propped cantilever carries a central point load W at midspan, the value of prop reaction is

(A) $\frac{11}{16}W$ (B) $\frac{5}{16}W$

(C) $\frac{2}{16}W$ (D) $\frac{4}{16}W$

39. A Rigid Prop is one which

(A) permits 50% of free deflection, that would have occurred if the prop were not there

(B) does not permit any displacement perpendicular to the plane of prop

(C) does not offer any reaction

(D) supports the entire load and relieves all other supports completely

40. The stiffness of a member is the moment required to be applied at the simply supported end to produce

(A) a unit rotation at fixed end

(B) a unit rotation at simply supported end

(C) a unit deflection at the simply supported end

(D) a unit rotation at both ends

41. If K_i is the stiffness of i^{th} member at a joint, the distribution factor for the member is

(A) $\frac{K_i}{\Sigma K_i}$ (B) ΣK_i

(C) K_i (D) $(\Sigma K_i - K_i)$

42. For a column of given material, the Rankine's constant depends on

(A) length of column (B) diameter of column

(C) moment of inertia of column (D) none of the above

43. The stiffness factor at the near end of a member with far end hinged is

(A) $\frac{4EI}{l}$ (B) $\frac{3EI}{l}$

(C) $\frac{EI}{l}$ (D) EI

44. If M is applied moment at hinged, then the induced moment at fixed end is

(A) M (B) $\frac{M}{3}$

(C) $\frac{M}{4}$ (D) $\frac{M}{2}$

45. Using Mohr's Theorem II, the following can be computed :

(A) Slope of a beam (B) Deflection of a beam

(C) Slope and Deflection of beam (D) All the above

46. Column is a member which is subjected to

(A) Tensile Force
(B) Compressive Force
(C) Shear Force
(D) Twisting Force

47. A temporary structure erected with a purpose of providing a safe working platform is known as

(A) centering
(B) shore
(C) rake
(D) scaffolding

48. The most commonly used deep foundation in buildings

(A) well foundation
(B) pile foundation
(C) raft foundation
(D) grillage foundation

49. For the slabs and beams, the grade of concrete mix generally used is

(A) 1 : 1½ : 4
(B) 1 : 2 : 4
(C) 1 : 2 : 6
(D) 1 : 3 : 6

50. PVC stands for

(A) Plastic Very Compact
(B) Phosphorous-Vanadium-Carbide
(C) Poly Vinyl Chloride
(D) Polythene Vinyl Carbide

51. In quick setting cement, the compound added is

(A) Aluminium sulphate
(B) Gypsum
(C) Aluminium silicate
(D) Calcium sulphate

52. The standard size of a masonry brick is

(A) 19 cm × 9 cm × 9 cm
(B) 18 cm × 9 cm × 4.5 cm
(C) 19 cm × 9 cm × 4.5 cm
(D) 18 cm × 9 cm × 9 cm

53. Cement concrete mix which is generally provided at plinth level to work as D.P.C.

(A) 1 : 1½ : 3
(B) 1 : 3 : 6
(C) 1 : 4 : 8
(D) 1 : 1 : 2

54. The horizontal wooden or steel members which support the common rafter in a truss are called

(A) purlins
(B) battens
(C) cleats
(D) posts

55. A wall which is constructed to divide the space within the building into rooms is called

(A) partition wall (B) cavity wall

(C) normal wall (D) plain wall

56. The tool used by the masons to check the verticality of walls is

(A) square (B) spirit level

(C) nicker (D) plumb bob

57. The plate loading test gives

(A) the ultimate loading of the soil

(B) the ultimate bearing capacity of the soil

(C) safe bearing capacity of the soil

(D) the depth of underlying rock

58. Which proportion of cement mortar used for pointing work ?

(A) 1 : 3 (B) 1 : 5

(C) 1 : 7 (D) 1 : 6

59. Age of a tree can be estimated

(A) from the height of the tree

(B) diameter of the bark

(C) number of rings on the cross-section

(D) cambium layers

60. For the construction of structures under water, the lime used is

(A) Fat lime (B) Quick lime

(C) Hydraulic lime (D) Pure lime

61. The commonly used base material for distempers is

(A) Chalk (B) Water

(C) Glue (D) Pigments

62. The type of mortars commonly used for plastering :

(A) Lime mortar (B) Cement mortar

(C) Lime cement mortar (D) All the above

63. The normal height of the door in residential buildings

(A) 1.5 m (B) 1.75 m

(C) 2.0 m (D) 2.5 m

64. The pile which has an enlarged shape at the base is called

(A) Vibro pile (B) Franki pile

(C) Under reamed pile (D) Raymond pile

65. The defect in painting caused by excess moisture vapourising in back of the paint film is known as

(A) Wrinkling (B) Alligatoring

(C) Blistering (D) Scaling

66. The 'bulking' of sand, occurs due to

(A) Air in voids (B) Moisture in voids

(C) Surface tension (D) Capillarity action

67. As per the Darcy's law of flow of water through soil, the rate of flow is

(A) directly proportional to the hydraulic gradient

(B) inversely proportional to the hydraulic gradient

(C) constant

(D) none of the above

68. The ratio of the volume of voids to the volume of soil solids in the given soil mass is called

(A) porosity (B) voids ratio

(C) air ratio (D) percentage of voids

69. The effective size of soil is

(A) D_{10} (B) D_{30}

(C) D_{60} (D) D_{50}

70. The curves used in vertical alignment is

(A) Summit curves (B) Valley curves

(C) All of the above (D) None of the above

71. The grooving tool used for liquid limit determination is

(A) Casagrante tool (B) ASTM tool

(C) All of the above (D) None of the above

72. The term mostly used for fine grained soils is

(A) Consistency (B) Liquid Limit

(C) Plastic limit (D) All of the above

73. The maximum water content at which a reduction in water content will not cause a decrease in the volume of a soil mass is called

(A) Liquid limit (B) Plastic limit

(C) Shrinkage limit (D) None of the above

74. For a well graded soil the coefficient of curvature will be between

(A) 1 and 10 (B) 2 and 8

(C) 3 and 7 (D) 1 and 3

75. The minimum size of silt particles is

(A) 0.002 mm (B) 0.04 mm

(C) 0.06 mm (D) 0.03 mm

76. Term/s used to indicate grain sizes

(A) gravel (B) sand

(C) silt (D) All of the above

77. A structure supporting a bridge at its ends is called

(A) Pier (B) Abutment

(C) Wing wall (D) Retaining wall

78. The rise of the carriage way at the outer edge is termed as

(A) gradient (B) super-elevation

(C) camber (D) transition curve

79. The traffic which measures the proportion of different types of traffic and establish relative importance of roads is called

(A) Traffic volume study (B) Road parking study

(C) Speed and delay study (D) Origin and destination study

80. Camber for an earthen road is generally kept at

(A) 1 in 5 (B) 1 in 10

(C) 1 in 15 (D) 1 in 20

81. The length of road provided for clear visibility of objects while driving is called

(A) reaction distance (B) braking distance

(C) sight distance (D) lateral distance

82. The most accurate method of determining the water cement in the laboratory is

(A) Oven drying method (B) Pipette method

(C) Hydrometer method (D) None of the above

83. D_{10} of the soil is the diameter in mm such that

(A) 10% of the soil is coarser than this value

(B) 10% of the soil is finer than this value

(C) this value has no bearing on particle size distribution

(D) none of the above

84. Relationship between void ratio (e) and porosity (n) is given by

(A) $e = n(1 + n)$ (B) $e = n(1 + e)$

(C) $e = n(1 - e)$ (D) None of the above

85. Super-elevation required on horizontal curves is calculated from the formula

(A) $e = \frac{v^2}{225\ R}$ (B) $e = \frac{RV^2}{225}$

(C) $e = \frac{R^2}{225\ V}$ (D) $e = \frac{V^2}{25\ R}$

86. Ruling gradient in plains is

(A) 1 in 20 (B) 1 in 30

(C) 1 in 40 (D) 1 in 50

87. If the orifice is called large orifice, the head of liquid is

(A) more than 5 times the depth of orifice

(B) less than 5 times the depth of orifice

(C) equal to 5 times the depth of orifice

(D) All of these

88. Venturimeter is used to measure

(A) Velocity at a point
(B) Discharge
(C) Pressure at a point
(D) Average velocity

89. Centre of pressure of a plane surface immersed in a liquid is

(A) below the centre of gravity of the plane surface
(B) above the centre of gravity of the plane surface
(C) at the centre of gravity of the plane surface
(D) none of the above

90. A laminar flow changes to turbulent flow when

(A) Velocity is increased
(B) Diameter of a pipe is increased
(C) Viscosity of a fluid is decreased
(D) All of the above

91. In Chezy's formula, Chezy's constant $C = \frac{157.6}{1.81 + \frac{K}{\sqrt{m}}}$ is suggested by

(A) Kutter
(B) Bazin
(C) Manning
(D) Powell

92. A flow is said to be laminar, when the fluid particles move along

(A) well defined path
(B) Zig-zag way
(C) Reynold number is heavy
(D) All of these

93. The co-efficient of discharge for External cylindrical mouthpiece is

(A) 0.50
(B) 0.855
(C) 0.707
(D) 1.0

94. The loss of head due to sudden contraction of a pipe, if cc = 0.62 is equal to

(A) $\frac{0.375\ V_2^2}{2g}$
(B) $\frac{0.5\ V_2^2}{2g}$
(C) $\frac{0.62\ V_2^2}{2g}$
(D) All of these

95. The discharge through a trapezoidal channel is maximum, then
(A) Half of sloping side = Top width
(B) Sloping side = Half of top width
(C) 1.5 × Sloping side = Top width
(D) None of the above

96. The flow in open channel is laminar if the Reynolds number is
(A) less than 2000
(B) 2000
(C) less than 500
(D) none of the above

97. The ratio of actual discharge to its theoretical discharge is called
(A) co-efficient of contraction
(B) co-efficient of discharge
(C) co-efficient of velocity
(D) co-efficient of viscosity

98. The assumptions made in the derivation of Bernoulli's equation is
(A) the flow is steady
(B) the flow is ideal
(C) the flow is incompressible
(D) all of these

99. The Inlet length of a venturimeter is
(A) equal to the outlet length
(B) less than the outlet length
(C) more than the outlet length
(D) none of the above

100. Which mouthpiece is having max. co-efficient of discharge ?
(A) Internal mouthpiece
(B) Convergent-Divergent mouthpiece
(C) External mouthpiece
(D) All of these

101. The value of 'C' according to Manning's formula in open channel is given by
(A) $C = \frac{1}{\sqrt{N}} . m^{1/6}$
(B) $C = N . m^{1/6}$
(C) $C = \sqrt{N} . m^{1/6}$
(D) $C = \frac{1}{N} . m^{1/6}$

102. The loss of head in pipes due to friction from Darcy's equation is given by
(A) $h_f = \frac{f.L.V^2}{2gd}$
(B) $h_f = \frac{4.f.L.V^2}{2gd}$
(C) $h_f = \frac{f.V^2}{2gd}$
(D) $h_f = \frac{f.L.V^2g}{2d}$

103. Gauge pressure at a point is equal to

(A) Absolute pressure minus Atmospheric pressure

(B) Absolute pressure plus Atmospheric pressure

(C) Absolute pressure plus vacuum pressure

(D) None of the above

104. For standing crops in undulating sandy fields, the best method of irrigation is

(A) Sprinkler Irrigation (B) Check method

(C) Furrow method (D) All of these

105. If the fluid particles move in straight lines and all the lines are parallel to the surface, the flow is

(A) Laminar (B) Steady

(C) Uniform (D) Compressible

106. Pascal's law states that pressure at a point is equal in all directions

(A) in a fluid at rest (B) in a liquid at rest

(C) in a turbulent flow (D) in a laminar flow

107. The additive constant of a Theodolite is

(A) $\left(\frac{f}{i} + d\right)$ (B) $\frac{f}{i}$

(C) $(f + d)$ (D) $\left(\frac{f}{d} + i\right)$

108. If the Bearing of PQ is 50° and bearing of QR is 310°, then angle PQR is

(A) 100° (B) 80°

(C) 90° (D) 40°

109. The sum of interior angles for a closed traverse shall be equal to

(A) (2n + 4) right angles (B) $\left(2n + \frac{n}{4}\right)$ right angles

(C) (2n – 4) right angles (D) (4 + 2n) right angles

110. The first staff reading after the level has been moved to a new position is

(A) Fore sight (B) Back sight

(C) Inter sight (D) Any sight

111. In a stadia diaphragm, the number of horizontal cross wires is

(A) Two (B) Four

(C) Three (D) One

112. In plane table survey, the instrument used for accurate centering is

(A) Alidade (B) Plumbing fork

(C) Trough compass (D) Spirit level

113. A 15 cm theodolite means

(A) Height of standard is 15 cm (B) Diameter of lower plate is 15 cm

(C) Radius of upper plate is 15 cm (D) Length of Telescope is 15 cm

114. The Latitude of any traverse line is obtained by multiplying its length by

(A) sine of its reduced bearing (B) cosine of its reduced bearing

(C) tangent of its reduced bearing (D) cosec of its reduced bearing

115. Size of a theodolite is specified by

(A) Length of the telescope (B) Diameter of the vertical circle

(C) Diameter of the upper plate (D) Diameter of the lower plate

116. The working edge of an alidade is known as

(A) Fiducial edge (B) Straight edge

(C) Ebonite edge (D) Graduated edge

117. Eight readings were recorded in a level book. If the instrument was shifted after 3rd and 6th readings, then the B.S. are

(A) 3rd and 6th readings (B) 2nd and 5th readings

(C) 4th and 7th readings (D) 3rd reading only

118. Three point problem can be solved by

(A) Bessel's method (B) Tracing paper method

(C) Lehmans' method (D) All of the above

119. Reading of the metric levelling staff can be taken accurately upto

(A) 0.01 m (B) 0.001 m

(C) 0.005 m (D) 0.05 m

120. A change point is

(A) the last station

(B) the first station

(C) the line parallel to the bubble tube

(D) the intersight where F.S and B.S are taken

121. One of the tacheometric constant is additive, the other constant is

(A) subtractive constant (B) multiplying constant

(C) dividing constant (D) indicative constant

122. Plotting of inaccessible points on a plane table is done by

(A) Intersection (B) Radiation

(C) Resection (D) Traversing

123. The constant vertical distance between two adjacent contours is called

(A) Horizontal interval (B) Horizontal equivalent

(C) Vertical equivalent (D) Contour interval

124. Match List – I correctly with List – II and select your answer using the codes given below :

	List – I		**List – II**
(a)	S 30° W	1.	350°
(b)	N 40° E	2.	210°
(c)	S 20° E	3.	40°
(d)	N 10° W	4.	160°

	a	b	c	d
(A)	1	2	3	4
(B)	2	3	4	1
(C)	1	4	3	2
(D)	4	3	2	1

125. The horizontal angle between true meridian and magnetic meridian is known as

(A) Bearing (B) Declination

(C) Dip (D) Convergence

126. A well conditioned triangle should not have any angle less than

(A) 20° (B) 30°

(C) 45° (D) 60°

127. The last trap provided in a house drainage system is

(A) Q trap
(B) Floor trap
(C) Nahani trap
(D) Intercepting trap

128. The common end products for both aerobiosis and anaerobiosis is

(A) H_2S
(B) CH_4
(C) NO_3
(D) CO_2

129. A unit working purely on anaerobic condition is

(A) Trickling filter
(B) Contact beds
(C) Septic tank
(D) Activated sludge process

130. In chlorination the most effective kill is due to

(A) HCl
(B) HOCl
(C) OCl
(D) Cl

131. Air valves are provided at

(A) Dead ends
(B) Saddles
(C) Summits
(D) Regularly at 1 m intervals

132. In rapid sand filters, the size of sand particles is desired in the range of

(A) 0.01 mm to 0.1 mm
(B) 0.02 mm to 0.3 mm
(C) 0.35 mm to 0.6 mm
(D) 2 mm to 5 mm

133. The effluents from the septic tank are discharged into

(A) Soak pit
(B) Oxidation pond
(C) Cess pool
(D) All of the above

134. The usual capacity of flushing cisterns for water closets is

(A) 5 to 15 litres
(B) 3.5 litres
(C) 25 to 40 litres
(D) 50 litres

135. Which of the following valve prevents back flow of water in a pipe ?

(A) Reflux valve
(B) Gate valve
(C) Air valve
(D) Scour valve

136. In sewage treatment plants, the oil and crease is removed by

(A) Oxidation
(B) Filtration
(C) Skimming
(D) Screening

137. Colour of fresh sewage is

(A) Green
(B) Brown
(C) Pink
(D) Grey

138. Usually the water supply scheme is designed for a period of

(A) 20 to 30 years
(B) 10 years
(C) 50 years
(D) 5 years

139. Disinfection is the process of

(A) killing all the bacteria
(B) killing only pathogenic bacteria
(C) complete destruction of life
(D) killing of harmful organisms causing disease

140. If the sedimentation tank is rectangular in shape having length L, width W, and depth D, then for discharge equal to Q, the settling velocity of a particle would be

(A) $\frac{Q}{B \times D} = \frac{Q}{BD}$
(B) $\frac{Q}{L \times W} = \frac{Q}{LW}$
(C) $\frac{Q}{B \times W} = \frac{Q}{BW}$
(D) $\frac{Q}{B \times L} = \frac{Q}{BL}$

141. The desirable temperature of portable water is

(A) 10 °C
(B) 20 °C
(C) 27 °C
(D) 37 °C

142. A good source of water requiring practically the least treatment is

(A) a perennial river
(B) an impounded reservoir
(C) a deep well
(D) an elevated tank

143. As per IS 1172-1983 the water consumption per head per day for domestic purposes for average condition is taken as

(A) 100 litres/day
(B) 135 litres/day
(C) 200 litres/day
(D) 250 litres/day

144. The method used for valuation of buildings is

(A) Rental Method of Valuation

(B) Depreciation Method of Valuation

(C) Valuation based on Profit

(D) Any one of the above

145. For preparing 10 cu. m of 1 : 4 : 8 cement concrete, the requirement of sand would be

(A) 0.7 cu. m (B) 2.8 cu. m

(C) 1.15 cu. m (D) 4.74 cu. m

146. In a day 550 cu. m of mortar is to be delivered. The number of labourers to be employed should be

(A) 5 (B) 110

(C) 15 (D) 25

147. Unit of measurement for earthwork excavation is

(A) cu. m (B) km

(C) cm (D) m^2

148. When the loan against mortgage of property is repaid together with interest, the mortgagor has got the right to free his property from the mortgage and this is known as

(A) Clearance (B) Settlement

(C) Neutralization (D) Equity of redemption

149. The net annual letting out value of a property, which is obtained after deducing the amount of yearly repairs from the gross income, is known as

(A) Market value (B) Book value

(C) Sinking value (D) Ratable value

150. Which estimate is expected to be least accurate ?

(A) Preliminary estimate (B) Plinth area estimate

(C) Detailed estimate (D) Revised estimate

151. The openings constructed on lines of sewers or drains in order to enable men to enter or leave the sewer is known as

(A) Lamp hole
(B) Man hole
(C) Inspection chambers
(D) Steel inlets

152. A coagulant generally used in water treatment is

(A) Chloride
(B) Bleaching powder
(C) Alum
(D) Ferric chloride

153. The main disadvantage of hard water is

(A) more turbidity
(B) foul smell
(C) increased soap consumption
(D) bad taste

154. A cantilever beam of length l carries a point load W at free end. The deflection at free end is

(A) $\delta = 0$
(B) $\delta = \frac{Wl^3}{EI}$
(C) $\delta = \frac{Wl^3}{3EI}$
(D) None of the above

155. A person who takes the lease is known as

(A) Leaser
(B) Leaseholder
(C) Owner
(D) Short-term owner

156. Rolling shutters are measured in terms of

(A) Area in square metres
(B) Running metres
(C) Gauge
(D) Weight

157. Quantities for iron work are computed generally in terms of

(A) Numbers
(B) Numbers and Signs
(C) Weight in kilograms
(D) Volume in Cubic metres

158. Plinth area normally does not include area covered under

(A) Lavatories
(B) Garage
(C) Open courtyard
(D) All of the above

159. For 5000 bricks, in 1 : 2 cement mortar, the cubic metres of sand required would be

(A) 1.0
(B) 2.0
(C) 4.0
(D) 5.5

160. Of the total estimated cost of a building, electrification usually accounts for

(A) 1%
(B) 2%
(C) 8%
(D) 25%

161. How many mazdoors will be required for the disposal of 30 cu. m of surplus earth within a lead of 30 m in one day ?

(A) 1
(B) 5
(C) 10
(D) 30

162. The original cost of a property minus the amount of depreciation upto previous year is known as

(A) Market value
(B) Book value
(C) Sinking value
(D) Rentable value

163. In the detailed estimate the volumes are worked out to the nearest

(A) 0.00001 m^3
(B) 0.0001 m^3
(C) 0.001 m^3
(D) 0.01 m^3

164. The value of dismantled material is known as

(A) Scrap value
(B) Resultant value
(C) Salvage value
(D) None of the above

165. The volume of cement in a 50 kg bag is

(A) 0.025 m^3
(B) 0.034 m^3
(C) 0.044 m^3
(D) 0.05 m^3

166. The unit of measurement for flooring concrete work is

(A) cu. m (B) sq. m

(C) k.m (D) None of the above

167. If 'd' is the diameter of the bar to be embedded, τ_{bd} is average bond stress, σ_{st} is the tensile stress in the bar, then the minimum length 'L' of embedment to ensure no slipping is given by

(A) $L = \frac{d \times \sigma_{st}}{4\tau_{bd}}$ (B) $L = \frac{d \times \sigma_{st}}{2\tau_{bd}}$

(C) $L = 2d \times \sigma_{st} / \tau_{bd}$ (D) $L = 4d \times \sigma_{st} / \tau_{bd}$

168. Identify the incorrect statement, if any

(A) The crack in R.C. structure will be farther apart with increase in diameter of the reinforcing BAR.

(B) The cracks are farther, apart with decrease in percentage of steel.

(C) The cracks are closer with deformed bars.

(D) None of the above.

169. The maximum strain in the tension reinforcement in the section w failure shall not be less than

(A) $\frac{f_y}{1.115\ ES} + 0.02$ (B) $\frac{f_y}{1.002\ ES} + 1.115$

(C) $\frac{f_y}{1.10\ ES} + 0.002$ (D) $\frac{f_y}{1.15\ ES} + 0.002$

170. In an RCC column the diameter of the longitudinal bars used is 25 mm, the column is circular in cross-section with mean diameter of 650 mm, the minimum cover of concrete clear of longitudinal bar should be

(A) 25 mm (B) 40 mm

(C) 50 mm (D) 60 mm

171. The buckling load on a steel column is

(A) Directly proportional to the slenderness ratio

(B) Inversely proportional to the slenderness ratio

(C) Related to the length

(D) Non-linearly related to the slenderness ratio

172. A truss is said to be internally statically determinate if

(A) the number of member forces are less than the number of equilibrium equations.

(B) The number of member forces are equal to the number of equilibrium equations.

(C) $2J - 5 = M$

M = number of members

J = number of joints

(D) The number of unknown deformation are equal to the number of equilibrium equations.

173. Spot welding is usually done in member joints under

(A) Tension only

(B) Compression only

(C) Tension (N) compression

(D) None of the above

174. Normally maximum value of span/depth ratio for simply supported beam is taken as

(A) 10 (B) 15

(C) 20 (D) 25

175. The unit weight of RCC is generally taken as

(A) 18 kN/m^3 (B) 24 kN/m^3

(C) 25 kN/ m^3 (D) 26 kN/m^3

176. The advantage of using steel as structural member is

(A) High strength
(B) Long life
(C) Can be easily fabricated
(D) All the above

177. As per IS-456-2000, maximum reinforcement required for Beam sections shall not exceed

(A) 0.045 bD
(B) 0.04 bD
(C) 0.44 bD
(D) 0.14 bD

178. The nodulus of elasticity of concrete improves with

(A) Age
(B) High W/C ratio
(C) Better compaction
(D) All the above

179. The maximum compressive strain in concrete in axial compression is taken as

(A) 0.004
(B) 0.0035
(C) 0.002
(D) 0.003

180. Minimum eccentricity '*l* mim' of column is given by

(A) *l* mim = *l* /400 + D/30
(B) *l* mim = *l*/500 + D/40
(C) *l* mim = *l* /500 + D/30
(D) None of the above

181. Effective span of a simply supported beam

(A) $L_c + d$
(B) $L_c + 3d$
(C) C/C SPAN
(D) $L_c + 2f$

182. The maximum admissible slenderness ratio of steel column subjected to dead (or) live load only is

(A) 120
(B) 180
(C) 250
(D) 350

183. Now-a-days, beams are generally find favour with designers as compared to trusses because

(A) Beams are readily available

(B) Beams gives good appearance

(C) Beams can be easily laid

(D) Load carrying capacity of the beam is high

184. The ratio of rise to the full span of the truss is called

(A) Slenderness Ratio

(B) Lateral Ratio

(C) Buckling Ratio

(D) Pitch

185. The allowable direct tensile stress in structural steel is about where f_y is the yield stress in steel.

(A) 45% f_y

(B) 60% f_y

(C) 66% f_y

(D) 5% f_y

186. The spacing of vertical stirrups in a Rectangular Beam is

(A) Maximum near the centre

(B) Minimum near the centre

(C) Minimum near the support

(D) Maximum near the support

187. If d is the distance between equidistant ordinates, the Simpson's rule for the area is

(A) $\frac{d}{2}[01 + 0n + 2(02 + 03 + \ldots)]$

(B) $\frac{d}{3}[01 + 0n + 2(03 + 05 + \ldots) + 4(02 + 04 + \ldots)]$

(C) $\frac{d}{6}[01 + 0n + 2(02 + 04 + \ldots) + 4(03 + 05 + \ldots)]$

(D) None of the above

188. The planning undertaken by the contractor after receipt of Tender Notice and before submitting the Bid is

(A) Tender Scheduling

(B) Schedule Planning

(C) Post-Tender Planning

(D) Pre-Tender Planning

189. Certain changes and deviations apart from contract done at site is recovered in

(A) M-book

(B) Site Order Book

(C) Engineer's Handbook

(D) All the above

190. Standard deviation when optimistic time is 1 day, pessimistic time is 8 days and most likely time is 3 days is

(A) 1.167 days

(B) 2.5 days

(C) 3.5 days

(D) 4 days

191. Work study is the collective term used to indicate the twin techniques of

(A) Time & Cost Study

(B) Time Study & Motion Study

(C) Cost & Material Study

(D) None of the above

192. A military type organisation is known as

(A) Line organisation

(B) Line and staff organisation

(C) Government organisation

(D) Functional organisation

193. The Indian Trade Union Act 1926 deals with

(A) Minimum wage payable to workers

(B) Registration, obligation and liabilities of trade union

(C) Working hours, safety, welfare and health of workers

(D) All the above

194. PERT is

(A) Activity oriented

(B) Event oriented

(C) Time oriented

(D) Resources oriented

195. Crashing is

(A) reduction in duration
(B) reduction of resource
(C) reduction of cost
(D) reduction in project size

196. A Dummy activity

(A) is an artificial activity
(B) it is represented on the arrow diagram by a dotted line
(C) does not require any time
(D) All the above

197. The main purpose of the trade union is to safeguard the interest of the

(A) workers
(B) organisation
(C) Government
(D) employers and employees

198. Workers dies while working on the work site, the labour law under which his compensation payable is

(A) Factories Act
(B) Employees State Insurance Act
(C) Workman's Compensation Act
(D) Payment of Wages Act

199. Settlement of a dispute by Arbitrator is from

(A) Chief Engineer of same Department
(B) Superintending Engineer of another circle
(C) Executive Engineer
(D) District Court Judge

200. A M-Book is used to record measurements

(A) of works only
(B) of materials supplied
(C) extra work done at site
(D) work done as well as supply materials