FAR WESTERN UNIVERSITY
Faculty of Engineering
Mahendranagar, Kanchanpur, Nepal
[MSc CPM Entrance Examination 2081]

Full Marks: 100
Time: 2 hours

Attempt all questions:

Read the following questions and write down the correct option A, B, C, or D in the answer sheet provided. Each question carries 1 (one) mark.

1. The probability of an event A occurring is 0.5 and of B occurring is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B occurring is
   (A) 0.2 (B) 0.3 (C) 0.4 (D) 0.5
2. Find the median, mode and mean of 9, 5, 8, 9, 9, 7, 8, 9, 8?
   (A) 9,9,9 (B) 9,8,9 (C) 8,9,8 (D) 8,9,9
3. Any measure indicating the center of a set of data, arranged in an increasing or decreasing order of magnitude is called a measure of _____ .
   (A) Skewness (B) Central tendency (C) Dispersion (D) Symmetry
4. A well-shuffled 52 cards deck is used to draw a card. What is the probability of getting a red suit king?
   (A) 3 / 36 (B) 1 / 26 (C) 3 / 26 (D) 1 / 16
5. 30 is the mean of the five numbers. Their mean becomes 28 if one of the numbers is left out. The omitted quantity is:
   (A) 28 (B) 30 (C) 35 (D) 38
6. Calculate the value of Q^2 if one root of the equation $5x^2 + 2x + Q = 2$ is reciprocal of another.
   (A) 1 (B) 4 (C) 25 (D) 49
7. If A is m * n matrix such that AB & BA both are defined, then B is a matrix of order
   (A) n * n (B) m * m (C) m * n (D) n * m
8. If x satisfies the inequality $\log_{25} x^2 + (\log_5 x)^2 < 2$ then x belongs to
   (A) (1/5,5) (B) (1/25,5) (C) (1/5,25) (D) (1/25,25)
9. Find the length of the vector represented by the directed line segment with initial point P (2, -3, 4) and terminal point Q (-2, 1, 1).
   (A) √32 (B) √39 (C) √41 (D) √43
10. The area of a sector of a circle with radius 28 cm and central angle 45° is
    (A) 294 cm^2 (B) 308 cm^2 (C) 322 cm^2 (D) 344 cm^2
11. In the triangle ABC, AB = 12 cm and AC = 10 cm, and ∠BAC = 60°. What is the value of the length of the side BC?
    (A) 7.13 cm (B) 10 cm (C) 11.13 cm (D) 13.20 cm
12. A wire is bent to form a square of side 22 cm. If the wire is rebent to form a circle, then its radius will be:
    (A) 22 cm (B) 14 cm (C) 11 cm (D) 7 cm
13. The ratio of the volumes of two cubes is 729: 1331. What is the ratio of their total surface areas
    (A) 81:121 (B) 9:11 (C) 729:1331 (D) 27:121
14. If a polygon has 8 sides, then the number of diagonals it has is:
    (A) 8 (B) 16 (C) 20 (D) 24

15. The value of the surface integral $\oiint_S z\,dx\,dy$ where S is the external surface of the sphere $x^2 + y^2 + z^2 = R^2$ is

(A) $4\pi R^3$ (B) 0 (C) $4\pi R^3/3$ (D) πR^3

16. The value of $\lim_{x\to\infty} \frac{x^2-5x+4}{4x^2+2x}$ is

(A) 0 (B) 1/4 (C) 1/2 (D) 1

17. The integral $\int \left(1 + x - \frac{1}{x}\right) e^{x+\frac{1}{x}}$ is equal to

(A) $(x-1)\,e^{x+\frac{1}{x}} + c$ (B) $x\,e^{x+\frac{1}{x}} + c$ (C) $(x+1)\,e^{x+\frac{1}{x}} + c$ (D) $-x\,e^{x+\frac{1}{x}} + c$

18. Find the co-ordinates of the point P which divides the join of A (3, -1) and B (-3, -4) in the ratio 2 : 1.

(A) (1, -3) (B) (-1, 3) (C) (-1, -3) (D) (1, 3)

19. What is the degree of the differential equation $y = x\left(\frac{dy}{dx}\right)^2 + \left(\frac{dx}{dy}\right)$

(A) 1 (B) 2 (C) 3 (D) 4

20. An aeroplane is flying at 1 PM with height of 20 m from a point on the ground. Determine the angle of elevation of aeroplane from other point $20\sqrt{3}$ m away from the point exact below of the aeroplane on the ground.

(A) 30° (B) 45° (C) 60° (D) 90°

21. Find the value of $(1+i)^{100}$.

(A) $2^{100}(\cos 100\pi + i\sin 100\pi)$ (B) $2^{100}(\cos 25\pi + i\sin 25\pi)$

(C) $2^{50}(\cos 100\pi + i\sin 100\pi)$ (D) $2^{50}(\cos 25\pi + i\sin 25\pi)$

22. What is the range of the function f(x) = 1 - sinx defined on entire real line?

(A) (0, 2) (B) [0, 2] (C) (-1, 1) (D) [-1, 1]

23. 11^{th} term of the A.P. -3, -1/2, 2 …. is

(A) 28 (B) 22 (C) 38 (D) 48

24. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, the other two sides of the triangle are equal to:

(A) Base = 10 cm and Altitude = 5 cm (B) Base = 12 cm and Altitude = 5 cm
(C) Base = 14 cm and Altitude = 10 cm (D) Base = 12 cm and Altitude = 10 cm

25. The mode and mean are given by 7 and 8, respectively. Then the median is:

(A) 1/13 (B) 13/3 (C) 23/3 (D) 33

26. Which one of the following survey is used to define the property line?

(A) City survey (B) Cadastral Survey (C) Land Survey (D) Topographical Survey

27. The permissible error (E) for the Precise Levellng type with distance (D) in kilometer is given by:

(A) $E = \pm 0.025\sqrt{D}$ (B) $E = \pm 0.100\sqrt{D}$ (C) $E = \pm 0.012\sqrt{D}$ (D) $E = \pm 0.006\sqrt{D}$

28. The lines joining points of equal dip are called

(A) Aclinic Lines (B) Isogonic Lines (C) Agonic lines (D) Isoclinic lines

29. Sum of interior angles for any traverse is check by _____

(A) (2N - 4) x 90 (B) (N - 4) x 90 (C) (2N + 4) x 90 (D) (N - 2) x 90

30. Contour lines cannot cross one another, except in case of an _____

(A) Overhanging cliff (B) Vertical cliff (C) Both A and B (D) None of above

31. For determining position of user in GPS, one needs to receive signals from at least _____ satellite/s.

(A) 1 (B) 2 (C) 4 (D) 5

32. A curve which consists of two circular arcs of same and different radius having their centers to the different sides of the common tangent is called:

(A) reverse curve (B) differential curve (C) compound curve (D) simple curve

33. When excess water in the concrete mix comes out causing small pores, it is called:

(A) Drip (B) Creep (C) Bleeding (D) Scaling

34. The minimum compressive strength of 2nd class bricks is

(A) 75 kg/cm^2 (B) 90 kg/ cm^2 (C) 100 kg/ cm^2 (D) 120 kg/ cm^2

35. What is the term for the unwanted and unsolicited messages that are sent over the internet?

(A) Malware (B) Phishing (C) Spam (D) Hacking

36. The concept of 'Global Village' was propounded by:

(A) Paulo Friere (B) Swami Vivekananda (C) Marshall McLuhan (D) Maria Montessori

37. Innovation is defined as:

(A) the commercialization of a new product or process. (B) the invention of a new product or process.

(C) a new product or process idea. (D) the implementation of a new production method.

38. The Damp Proof Course (DPC) is measured in

(A) Cub. m (B) Sq. m (C) Meters (D) All of these

39. The plinth area of the building does not includes

(A) Area of the walls at the floor level (B) Internal shaft for sanitary installations up to 2 sq m.
(C) Lift and wall including landing (D) Area of cantilevered porch

40. In the long and short wall method of estimation, the length of long wall is the centre to centre distance between the walls and

(A) Breadth of the wall (B) Half breadth of wall on each side

(C) One fourth breadth of wall on each side (D) All of these

41. Which among the following methods of calculating depreciation involves the study of property in detail and extent of physical deterioration worked out?

(A) Straight-line method (B) Constant percentage method

(C) Sinking fund method (D) Quantity survey method

42. The process of calculating the quantities and cost of various items of a building to know its probable cost is called

(A) Valuation (B) Capital value (C) Depreciation (D) Estimation

43. In which method it is assumed that the property will lose its value by a constant percentage of its value at the beginning of every year.

(A) Straight line method (B) Constant percentage method

(C) Sinking fund method (D) All of the above

44. Which of these refer to the water content of the soil that represents any boundary present between the liquid state and the plastic state?

(A) liquid limit (B) plastic limit (C) shrinkage limit (D) all of the above

45. During seepage through an earth mass, the direction of seepage is

(A) parallel to the equipotential lines (B) perpendicular to the streamlines

(C) perpendicular to the equipotential lines (D) along the direction of gravity

46. Theory of failure, was first proposed by _____

(A) Coulomb (B) Mohr (C) Casagrande (D) Darcy

47. Which of the following is an example of slopes extending to infinity?

(A) The inclined face of Earth dams (B) Embankments (C) Cuts (D) All of the above

48. Which the following is NOT an assumption of Rankine Theory?

(A) Vertical boundary formed by the vertical back of a smooth wall surface.

(B) Soil is homogenous and dry.

(C) Soil is cohesive.

(D) Semi-infinite mass of soil bound by a horizontal surface.

49. _____ footing is used in load bearing masonry construction.

(A) Isolated (B) Strap (C) Strip (D) Pile

50. Steining is a component of which of the below type of foundation?

(A) Pile (B) Strap (C) Isolated (D) Well

51. Bar charts were invented in

(A) 1910 (B) 1920 (C) 1930 (D) 1940

52. Critical Path Method was invented by

(A) Henry Gant (B) Morgan R Walker (C) US Navy (D) Peter Drucker

53. During storage of cement, the bag of cement should be kept ..... cm apart from the walls.

(A) 10 cm (B) 20 cm (C) 30 cm (D) 40 cm

54. PERT is

(A) activity oriented (B) event oriented (C) time oriented (D) resources oriented

55. If for an activity optimistic time is 1 day, pessimistic time is 11 days and most likely time is 3 days then the expected time is

(A) 3 days (B) 4 days (C) 5 days (D) 6 days

56. Negative slack occurs

(A) when latest allowable time is greater than earliest expected time

(B) when events stick to their schedule

(C) when deficiency of resources exist

(D) all of the above

57. Float is

(A) the earliest time by which an activity may commence

(B) latest time by which an activity can be delayed without hampering the completion of the project

(C) latest allowable time - earliest expected time

(D) time available - time required for an activity

58. The difference between total float and free float is called interfering flat which is nothing but the

(A) float of head event (B) float of tail event (C) slack of head event (D) slack of tail event

59. Crashing is

(A) Reduction in duration (B) reduction in resource

(C) reduction in cost (D) reduction in project size

60. Tender document does not contain

(A) tender form (B) BOQ (C) amount of earnest money (D) unit rate

61. The process of studying the result/output of a project is known as

(A) monitoring (B) evaluation (C) checking (D) appraisal

62. Functional organization system of working was introduced by

(A) Henry Gantt (B) F.W.Taylor (C) M.R. Walker (D) Max Weber

63. Petty Contract is

(A) work entrusted to a contractor without any restrictions (B) contract wholly owned by a single staff

(C) contract selected as the best one (D) a contract of small amount and volume.

64. Which of the following is not an excavating equipment?

(A) power shovel (B) scraper (C) dragline (D) hoe

65. The most suitable type of equipment for compaction of cohesive soils is

(A) smoothed wheeled roller (B) vibratory roller (C) sheep foot roller (D) tamper

66. The Nepalese Engineers Day is

(A) 3rd Shrawan (B) 4th Jestha (C) 3rd Jestha (D) 2nd Shrawan

67. The duration of notice for sealed quotation is ..... days.

(A) 7 (B) 15 (C) 30 (D) 45

68. The minimum value of benefit cost ratio for selection of any project should be

(A) less than 1 (B) equal to 1 (C) greater than 1 (D) none

69. The fund gradually accumulated by periodic deposit for replacement of a structure at the end of its life cycle is called

(A) sinking fund (B) capital fund (C) revolving fund (D) treasury

70. The benefit that is foregone by engaging the resource in a chosen activity instead of engaging the same resource in the foregone activity is known as

(A) marginal cost (B) opportunity cost (C) incremental cost (D) life cycle cost

71. The value of a fixed asset after deducting depreciation from the historical cost is called_____.

(A) Fair value (B) Book value (C) Market value (D) Net realisable value

72. The Depreciation remains constant according to which method?

(A) Sum of years digit (B) Units of production (C) Declining Balance (D) Straight Line Method

73. If two projects are mutually exclusive then:

(A) the one with the higher NPV should be chosen (B) the one with the positive NPV should be chosen
(C) the one with negative NPV should be chosen (D) rejects both the projects

74. Using benefit cost ratio analysis , the project is said to be feasible if:

(A) B / C > 1 (B) B / C < 1 (C) C / B > 1 (D) B / C = 1

75. Excessive spending power of consumers that pulls prices up is called:

(A) demand – pull inflation (B) cost – pull inflation (C) cost-push inflation (D) demand-push inflation

76. The maximum energy that can be absorbed up to the elastic limit, without creating a permanent distortion, is known as

(A) impact energy (B) proof resilience (C) proof stress (D) modulus of resilience

77. Which of the following is found out by calculating the area under the stress strain graph?

(A) Toughness (B) Hardness (C) Endurance (D) Strength

78. At the point of contraflexure, the value of bending moment is _____

(A) Zero (B) Maximum (C) Can't be determined (D) Minimum

79. A fixed beam is subjected to a uniformly distributed load over its entire span. The points of contra-flexure will occur on either side of the centre at a distance of _____ from the center.

(A) Zero (B) Maximum (C) Can't be determined (D) Minimum

80. According to IS 456 : 2000, the maximum diameter of reinforcing bars shall not exceed

(A) One-fourth of total thickness of slab (B) One-sixth of total thickness of slab
(C) One-eighth of total thickness of slab (D) One-tenth of total thickness of slab

81. In RCC beams, as the percentage area of tensile steel increases

(A) Depth of neutral axis increases (B) Depth of neutral axis decreases
(C) Lever arm decreases (D) Lever arm increases

82. For 2 way continuous slabs having shorter span (less than 3.5 m), with high strength deformed of Fe415 grade, span to overall depth ratio of slab, to satisfy the vertical deflection limits for loading class upto 3 kN/m2, is:

(A) 28 (B) 32 (C) 35 (D) 40

83. A compression member may be considered as short when both the slenderness ratio l/D and l/b are less than:

(A) 8 (B) 10 (C) 12 (D) 16

84. The minimum eccentricity to be considered for an axially loaded RCC column of size 400 mm × 400 mm with unsupported length of 5 m is:

(A) 15.6 mm (B) 20.5 mm (C) 23.3 mm (D) 30.6 mm

85. Schmidt's Rebound Hammer technique is used to measure:

(A) Tensile Strength (B) Shrinkage limit (C) Thickness of member (D) Surface hardness

86. What is the height of the crown that is to be provided for a district road 7 m wide, constructed with a cross fall of 1 in 50 bituminous pavement?

(A) 0.05 m (B) 0.07 m (C) 0.08 m (D) 0.1 m

87. The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called:

(A) tack coat (B) seal coat (C) prime coat (D) surface dressing

88. Minimum thickness of the base of a flexible pavement is

(A) 5 cm (B) 10 cm (C) 15 cm (D) 20 cm

89. What is the main design criterion for designing the rigid pavement?

(A) Shear stress (B) Compressive stress (C) Fatigue stress (D) Tensile stress

90. The water that cannot be drained of by gravity is called _____

(A) Pore water (B) Held water (C) Gravitational water (D) Capillary water

91. What does the term "unit" mean in unit hydrograph?

(A) Unit width of catchment (B) Unit area of catchment

(C) Unit volume of base flow (D) Unit depth of rainfall excess

92. Which of the following are the basic assumptions of unit hydrograph theory?

(A) Linear invariance and time response (B) Non-linear response and time variance

(C) Linear response and time invariance (D) Non-linear invariance and time response

93. The flood discharge adopted for design of a structure after careful consideration of economic and hydrologic factors is known as:

(A) peak flood (B) design flood (C) maximum probable flood (D) minimum probable flood

94. Which among the following is an assumption of Hagen-Poiseuille equation?

(A) Fluid is uniform (B) Fluid is laminar (C) Fluid is turbulent (D) Fluid is compressible

95. In the stability of floating bodies, the stable equilibrium is attained if the meta centre (M) point _____ the centre of gravity (G).

(A) coincides with (B) is parallel to (C) lies below (D) lies above

96. Which one of the following laws is applicable to a hydraulic lift?

(A) Kirchhoff's law (B) Archimedes' principle (C) Pascal's Law (D) Archimedes' Law

97. While considering the design period, which must be given more priority?

(A) Area of land (B) Population (C) Usage of water (D) Arrangement of pipes

98. Aeration of water is done to remove

(A) Odour (B) Colour (C) Bacteria (D) Turbidity

99. By boiling water, hardness can be removed if it is due to

(A) Calcium sulphate (B) Magnesium sulphate (C) Calcium nitrate (D) Calcium bicarbonate

100. Decomposition of waste inside sanitary landfills generates gas

(A) Nitrogen (B) Hydrogen (C) Methane (D) Carbon dioxide

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Attempt all questions:

Read the following questions and write down the correct option A, B, C, or D in the answer sheet provided. Each question carries 1 (one) mark.

1. If the ratio of men to women in a particular dormitory is 5:3, which of the following could not be the number of residents in the dormitory?
   (A) 24 (B) 40 (C) 96 (D) 150
2. If 25 students took an exam and 4 of them failed, what percent of them passed?
   (A) 21% (B) 42% (C) 84% (D) 96%
3. If 3a + 5b = 10 and 5a +3b = 30, what is the average (arithmetic mean) of a and b?
   (A) 1.5 (B) 2.5 (C) 3 (D) 4
4. What is the maximum area of the rectangle with perimeter 620 mm?
   (A) 24,025 mm^2 (B) 22,725 mm^2 (C) 24,000 mm^2 (D) 24,075 mm^2
5. If 15 workers can do a job in 24 days, how many days will 40 workers take to do the same job working at the same rate?
   (A) 6 (B) 9 (C) 15 (D) 24
6. What is the surface area of a cube whose volume is 64?
   (A) 16 (B) 64 (C) 96 (D) 128
7. Two acute angles in a right-angled triangle are in the ratio of 2:7. What is the measure of larger angle?
   (A) 40º (B) 50º (C) 60º (D) 70º
8. If $x^2 - y^2 = 32$ and x - y = 4, what is the average value of x and y?
   (A) 4 (B) 3 (C) 2 (D) 1
9. If 3 pieces of chocolates costs $ 0.50, how many chocolates can you buy for $10?
   (A) 20 (B) 40 (C) 60 (D) 80
10. What is the ratio of the circumference of a circle to its radius?
    (A) $\frac{\pi}{2}$ (B) $\sqrt{\pi}$ (C) π (D) 2π
11. Find relation between a and b such that the following limit is got after a single application of L'hospital's Rule $\lim_{x\to 0} \frac{ae^x + be^{2x}}{be^x + ae^{2x}}$
    (A) $^b/_a = 2$ (B) $^a/_b = 2$ (C) a = b (D) a = -b
12. If l, m, n are the direction cosines of a position vector $\vec{a}$, then which of the following is true?
    (A) $l^2+m^2-n^2=0$ (B) lmn=1 (C) $l^2+m^2+n^2=1$ (D) $l^2 m^2+n^2=1$
13. The quantity y = mx + c represents a .....
    (A) Circle (B) Straight line (C) Parabola (D) None of these

14. A dealer bought a mobile for $ 900 and later sold it for $ 1,260. By what percent did the value of mobile increase?
(A) 40% (B) 35% (C) 30% (D) 25%

15. Solution of the differential equation $\frac{dy}{dx}$ +ycotx= cosx is
(A) ycosx = $\frac{sin^2x}{2}$ +c (B) ysinx = $\frac{sin^2x}{2}$ +c (C) ysinx = $\frac{cos^2x}{4}$ +c (D) ycosx = - $\frac{sin^2x}{4}$ +c

16. Indira solved 24 math problems in 15 minutes. At this rate, how many problems can she solve in 40 minutes?
(A) 40 (B) 48 (C) 60 (D) 64

17. If $4^a \times 4^b = 4^{200}$, what is the average of a and b?
(A) 50 (B) 100 (C) 150 (D) 200

18. Which of the following is the adjoint of the matrix A=$\begin{bmatrix}1 & 5\\3 & 4\end{bmatrix}$?
(A) $\begin{bmatrix}4 & -5\\-3 & -1\end{bmatrix}$ (B) $\begin{bmatrix}-4 & 5\\-3 & 1\end{bmatrix}$ (C) $\begin{bmatrix}4 & -5\\-3 & 1\end{bmatrix}$ (D) $\begin{bmatrix}4 & 5\\-3 & 1\end{bmatrix}$

19. What is the area of a rectangle whose length is twice its width and whose perimeter is equal to that of a square whose area is 1?
(A) 6 (B) 2/3 (C) 4/3 (D) 8/9

20. If $\frac{1}{a} = \frac{1}{b} + \frac{1}{c}$, what is a in terms of b and c?
(A) $\frac{ab}{a+b}$ (B) $\frac{bc}{b+c}$ (C) $\frac{ac}{a+c}$ (D) None of these

21. If x% of y is 10, what is y?
(A) 10/x (B) 100/x (C) 1000/x (D) x/10

22. What is the sum of the product and quotient of 7 and 7?
(A) 47 (B) 48 (C) 49 (D) 50

23. If $2^x = 32$, what is x^2?
(A) 5 (B) 10 (C) 25 (D) 100

24. What is the value of $\frac{6!}{8!}$?
(A) 1/56 (B) 1/48 (C) 1/8 (D) 3/8

25. If $x^2 - y^2 = 28$ and x - y – 8, what is the average of x and y?
(A) 1.75 (B) 3.5 (C) 7 (D) 8

26. The process of determining the locations of the instrument station by drawing resectors from the location of the known stations is called.....
(A) Intersection (B) Radiation (C) Resection (D) Traversing

27. The bearing of lines AB is 152°30’ and angle ABC measured clockwise is 124°30’. The bearing of BC is
(A) 25°00’ (B) 95°00’ (C) 148°00’ (D)190°00’

28. If the reduced bearing of a line is N87°W, its whole circle bearing is
(A) 3° (B) 87° (C) 93° (D) 273°

29. If the angular measurements of a traverse are more precise than its linear measurements, balancing of the traverse, is done by

(A) Bowditch's rule (B) Transit rule (C) Empirical rule (D) None of these

30. If the R.L. of a B.M. is 100 m, the back sight is 1.215 m and the foresight is 1.870 m, the R.L. of the forward station is
(A) 99.345 m (B) 100.345 m (C) 100.655m (D) 101.870

31. The first reading from a level station is....
(A) Foresight (B) Intermediate sight (C) Backsight (D) Any sight

32. Reciprocal levelling eliminates
(A) Collimation error (B) Error due to earth's curvature
(C) Error due to atmospheric refraction (D) All of these

33. The rocks which are formed by gradual deposition, are called
(A) Sedimentary rocks (B) Igneous rocks (C) Metamorphic rocks (D) None of these

34. Sandstone is……
(A) Igneous rock (B) Sedimentary rock (C) Metamorphic rock (D) Volcanic rock

35. Most commonly used solvent in oil paints is…..
(A) Petroleum (B) Spirit (C) Coaltar (D) Turpentine

36. Stone to be used for rubble masonry must be
(A) Hard (B) Soft (C) Light (D) Heavy

37. The base material for distemper is….
(A) Lime (B) Lime putty (C) Cement wash (D) Chalk

38. The most fire-resistant paint is……
(A) Enamel paint (B) Aluminum paint (C) Asbestos paint (D) Cement paint

39. The frog of a brick is normally made on its…
(A) Top face (B) bottom face (C) Longer face (D) Shorter face

40. The raw material in the manufacture of cement is…..
(A) Basalt (B) Slate (C) Limestone (D) Sandstone

41. Slump test for concrete is carried out to determine
(A) Strength (B) Durability (C) Workability (D) Water content

42. The damp proof course is measured in…….
(A) Meter (B) Square meter (C) Cubic meter (D) None of these

43. The weight of 16 mm diameter mild steel bar per meter length is equal to……..
(A) 0.62 kg (B) 0. 89 kg (C) 1.58 Kg (D) 2.35 kg

44. The technique of finding the fair price of an existing building is known as…..
(A) Estimation (B) Valuation (C) Pricing (D) Costing

45. The approximate weight of one cubic meter mild steel is…..
(A) 2,400 kg (B) 4,600 kg (C) 7,850 kg (D) 10,000 kg

46. If B is the width of formation, d is the height of the embankment, side slope S:1, for a highway with no transverse slope, the area of cross-section is……
(A) B + d + Sd (B) $Bd + Sd^2$ (C) $Bxd - Sd^2$ (D) $(Bd + Sd^2)/2$

47. Cohesionless soil is …….
(A) Sand (B) Silt (C) Clay (D) None of these

48. The liquid limit and plastic limit exists in……..
(A) Sandy soil (B) Silty soil (C) Gravel soil (D) Clay soil

49. The property of a soil which permits water to percolate through it is called
(A) Moisture content (B) Permeability (C) Capillarity (D) None of these

50. The vane shear test is used for the in-situ determination of the undrained strength of the intact fully saturated
(A) Sands (B) Gravels (C) Clays (D) Highly organic soils

51. The active earth pressure of a soil is proportional to……..
(A) Tan (45°-θ) (B) Tan^2 (45°+θ) (C) Tan2 (45°-θ) (D) Tan (45°+θ)

52. Which one of the following is not an excavating and moving type of equipment?
(A) Bulldozer (B) Clam shell (C) Scraper (D) Dump truck

53. The artificial activity which indicates that an activity following it, cannot be started unless the preceding activity is complete, is known as …….
(A) Event (B) Free float (C) Dummy (D) None of these

54. Free float (FF) is the maximum amount of time an activity can be delayed without delaying the early start of any of its followers. FF is obtained by
(A) FF = EFj – ESi – D (B) FF = ESj – ESi – D (C) FF = EFi – ESi + D (D) FF = EFj – ESi + D

55. If t_O, t_P and t_L represent the optimistic, pessimistic, and most likely time estimates, the expected time of completion of the activity is …….
(A) $t_E = \frac{to + + tL + tp}{3}$ (B) $t_E = \frac{to + + 2tL + tp}{4}$ (C) $t_E = \frac{to + + 3tL + tp}{5}$ (D) $t_E = \frac{to + + 4tL + tp}{6}$

56. In CPM, the critical path represents the ……..
(A) Shortest path for the earliest completion of the project
(B) Longest path of the network for the earliest completion of the project
(C) Ideal path for the earliest completion of the project
(D) None of the above

57. Program Evaluation and Review Technique (PERT) analysis is based on..
(A) Optimistic time (B) Pessimistic time (C) Most likely time (D) All of these

58. Which of these is not the constraint of a project….
(A) Scope (B) Resources (C) Team (D) Budget

59. The process that evaluates project performance to provide confidence is called ……
(A) Quality assurance (B) Quality planning (C) Quality control (D) Quality audit

60. Bar charts are suitable for…
(A) Mega projects (B) Large projects (C) Medium projects (D) Small projects

61. Tender document includes, except
(A) Conditions of contract (B) Bill of quantities (C) Valid agreement (D) Specification

62. Chairperson of construction material rate fixation committee is …….
(A) Chairperson of District Coordination Office (B) Chief District Officer
(C) Chief Executive Officer (D) Chief Communication Officer

63. An employer must take the responsibility for the wrongdoing by his employee even though he has not committed that mistake is ……
(A) Vicarious liability (B) Negligence (C) Tort (D) None of these

64. Which of the following is not a profession?
(A) Engineering (B) Law (C) Medicine (D) Teaching

65. Accepted principles of right or wrong governing the conduct of engineers is called…
(A) Engineering values (B) Engineering conduct (C) Engineering ethics (D) Engineering principles

66. Which is NOT a professional style?
(A) Ethical (B) Emotional (C) Responsible (D) Intellectual

67. What is the process to resolve disputes?
(A) Mediation (B) Adjudication (C) Litigation (D) All of these

68. What is the market situation where there are many buyers and single seller?
(A) Perfect competition (B) Oligopoly (C) Monopoly (D) None of these

69. Capitalized cost of a project is also known as……..
(A) Infinite cost (B) Life cycle cost (C) Life cost (D) Project cost

70. Firm's liquidity can be judged by …
(A) Acid test ratio (B) Liquidity ratio (C) Current ratio (D) Debt ratio

71. The additional money received from selling the one or more unit at specified level of output is……
(A) Equivalent revenue (B) Marginal revenue (C) Average revenue (D) None of these

72. A uniform series of payment occurring at equal interval of time is called……
(A) Annuity (B) Amortization (C) Depreciation (D) Bond

73. The unknown incidental cost incurred in any project is called ……
(A) Work charged establishment (B) Overhead cost (C) Supervision cost (D) Contingency

74. What refers to the amount of money paid for the use of borrowed capital..
(A) Simple interest (B) Interest (C) Rate of interest (D) Principal

75. If interest is paid more than once in a year. "i" is the rate of interest per year. "n" is the number of periods in years and "m" is a compounding periods per year. Compounded amount factor is …..
(A) $(1+\frac{1}{m})^{1/n}$ (B) $(1+\frac{1}{m})^{1/m}$ (C) $(1+\frac{1}{m})^{m}$ (D) $(1+\frac{1}{m})^{n}$

76. The lateral deflection of a beam shall not exceed……
(A) $\frac{1}{250}$ of the span (B) $\frac{1}{350}$ of the span (C) 10 mm (D) 25 mm

77. If Q is load factor, S is the shape factor and F is factor of safety in elastic design, which relation is correct?
(A) Q = S + F (B) Q = S – F (C) Q = F – S (D) Q = F x S

78. If the modular ratio is m, steel ratio is r, and overall depth of a beam is d, the depth of the critical neutral axis of the beam, is?
(A) $\frac{m}{m-r}d$ (B) $\frac{m}{m+r}d$ (C) $\frac{m+r}{m}d$ (D) $\frac{r-m}{m}d$

79. The ratio of the lateral strain to linear strain is called…..
(A) Modulus of elasticity (B) Modulus of rigidity (C) Poisson's ratio (D) Bulk modulus

80. The diameter of longitudinal bars of a column should never be less than
(A) 8 mm (B) 10 mm (C) 12 mm (D) 16 mm

81. When load is transferred through one surface to another surface in contact, the stress is known as…
(A) Compressive stress (B) Shearing stress (C) Working stress (D) Tensile stress

82. Bitumen, stone chips and sand are mixed in asphalt concrete paver at a temperature of …..….
(A) 100° to 120° (B) 120° to 140° (C) 140° to 160° (D) 150° to 170°

83. In water bound macadam roads, binding material used, is…..
(A) Stone dust (B) Sand (C) Brick dust (D) Cement

84. The wall constructed for the stability of an excavated portion of a road on the hill side, is known as
(A) Retaining wall (B) Breast wall (C) Parapet wall (D) None of these

85. When upgrade meets a down grade, the vertical curve provided in a highway is known as
(A) Valley curve (B) Sag curve (C) Summit curve (D)None of these

86. If the elevations along a road increase, the slope of the road along the longitudinal direction, is known as……
(A) Positive grade (B) Negative grade (C) Grade (D) Gradient

87. The tangent length "T" of a simple circular curve of radius "R" deflecting through Δ is …..
(A) T = R sin Δ (B) T = R tan Δ (C) T = R sin Δ/2 (D) T = R tan Δ/2

88. The full width of land acquired before finalizing a road, is ……
(A) Formation width (B) Right of way (C) Carriage way (D) Roadway

89. Which of the following is a method used for predicting flood hydrographs?
(A) Hyetograph (B) Unit hydrograph (C) Normal hydrograph (D) Crest method

90. Surface water is obtained from ……
(A) Its intensity (B) Its duration (C) Its frequency (D) All of these

91. The rainfall at any place is described by …..
(A) Well (B) Springs (C) Artesian well (D) Rain

92. A unit hydrograph is a hydrograph of a rainstorm of a specified duration resulting from a runoff of ….
(A) 15 mm (B) 20 mm (C) 25 mm (D) 30 mm

93. The earthen embankments constructed parallel to the river banks at some suitable distance for flood control, is known as ….
(A) Flood wall (B) River wall (C) Dyke (D) None of these

94. Pressure relief valves are provided in water mains ….
(A) To reduce pressure (B) At low points (C) Upstream of sluice (D) All of these

95. A manhole is generally provided at each
(A) Change of diameter (B) Junction (C) Bend (D) All of these

96. Carbonates in water produce …
(A) Permanent hardness (B) Temporary hardness (C) Alkalinity (D) Acidity

97. The sludge does not contain wastewater from
(A) Bathrooms (B) Toilets (C) Wash basins (D) Kitchen sinks

98. The detention period for plain sedimentation water tanks, is usually….
(A) 4 to 8 hours (B) 8 to 16 hours (C) 16 to 24 hours (D) 24 to 36 hours

99. 5 days-biochemical oxygen demand (BOD5) is taken at a temperature of
(A) 0°C (B) 15°C (C) 20°C (D) 25°C

100. The best practice of disinfection of public water supply is by
(A) Boiling (B) Chlorination (C) Adding lime (D) Adding ozone