072/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Hooke's law is valid :
   (A) Only above elastic limit
   (B) Only within elastic limit
   (C) Only within plastic limit
   (D) Till breaking of substance

2. The bending moment on a section is maximum where shear force is :
   (A) Zero
   (B) Minimum
   (C) Changing sign
   (D) Maximum

3. The bending moment diagram for a cantilever carrying uniformly distributed load will be :
   (A) A triangle
   (B) A parabola
   (C) A cubic parabola
   (D) A rectangle

4. The moment of inertia of a circular section, about its axis, is given by :
   (A) $\frac{\pi(D)^4}{64}$
   (B) $\frac{\pi(D)^4}{32}$
   (C) $\frac{\pi(D)^4}{16}$
   (D) $\frac{\pi(D)^4}{8}$

5. A plane which is not subjected to shear stress is known as :
   (A) Compound plane
   (B) Simple plane
   (C) Non-shear plane
   (D) Principal plane

6. The unit of torque in SI units is :
   (A) kg cm
   (B) Newton-metre (N m)
   (C) kg/cm^2
   (D) None

7. In a cantilever beam tensile reinforcement is provided :
   (A) On top of beam
   (B) On bottom of beam
   (C) At middle of beam
   (D) On top and bottom of beam

8. Euler's formula is not valid for mild steel column when slenderness ratio is :
   (A) More than 80
   (B) More than 120
   (C) Less than 80
   (D) More than 30

9. The thickness of cylindrical shell is designed on the basis of :

(A) Longitudinal stress
(B) Bending stress
(C) Circumferential stress
(D) Hoop stress

10. The stress at which a material fractures under large number of reversal of stresses is called :

(A) Residual stress
(B) Creep
(C) Endurance limit
(D) Ultimate stress

11. In a closed coiled helical spring subjected to axial load, other quantities remaining the same, if the wire diameter is doubled, then the stiffness of the spring when compared to the original one, will become :

(A) Twice
(B) 4 times
(C) 8 times
(D) 16 times

12. A soil having uniformity coefficient less than 4 is called :

(A) Uniform
(B) Fine
(C) Coarse
(D) Well graded soil

13. The maximum size of clay particle is :

(A) 0.1 mm
(B) 0.03 mm
(C) 0.002 mm
(D) 0.0002 mm

14. The ratio between the total volume of voids and the total volume of solids is called :

(A) Void ratio
(B) Porosity
(C) Void fraction
(D) Solid fraction

15. The most accurate method of determining the water content in a sample of soil is :

(A) Sand bath method
(B) Calcium carbide method
(C) Oven drying method
(D) Alcohol method

16. Wet sieve analysis of fine particles is done if nearly all soil particles pass through square sieve openings of :

(A) 0.075 mm
(B) 0.045 mm
(C) 0.212 mm
(D) 0.300 mm

17. The plasticity index is equal to :

(A) Liquid limit – Shrinkage limit
(B) Liquid limit – Plastic limit
(C) Plastic limit – Liquid limit
(D) Plastic limit – Shrinkage limit

18. If during a permeability test on a soil sample with a falling head permeameter equal time intervals are noted for drop of head from h_1 to h_2 and again from h_2 to h_3 then which one of the following relation would hold good?

(A) $(h_1 - h_2) = (h_2 - h_3)$ (B) $h_3^2 = h_1 h_2$

(C) $h_1^2 = h_2 h_3$ (D) $h_2^2 = h_1 h_3$

19. The soils most susceptible to liquefaction are :

(A) Saturated dense sand

(B) Saturated fine and medium sands of uniform particle size

(C) Saturated clays of uniform size

(D) Saturated gravel and cobbles

20. The angle between the horizontal and the maximum slope that a soil assumes through natural process is called :

(A) Angle of internal friction (B) Cohesiveness

(C) Angle of repose (D) Hydraulic gradient

21. A saturated clay layer with single drainage face takes 4 years to attain 50% degree of consolidation. If the clay layer had double drainage, then the time taken to attain 50% degree of consolidation is :

(A) 1 year (B) 2 years

(C) 4 years (D) 8 years

22. A comparatively sudden reduction in volume of a soil mass under an applied load is called :

(A) Primary compression (B) Secondary compression

(C) Initial consolidation (D) Initial compaction

23. The law that states that laminar flow in a saturated soil, the velocity is directly proportional to the hydraulic gradient is called :

(A) Reynold's law (B) Bligh's law

(C) Lacey's law (D) Darcy's law

24. A foundation is considered as shallow if its depth is :

(A) Equal to or less than its width (B) Less than 1 meter

(C) Greater than its width (D) Greater than 1 meter

25. A grillage foundation is essentially a :

(A) Shallow foundation
(B) Deep foundation
(C) Spread foundation
(D) Pile foundation

26. Maximum bearing capacity can be expected from :

(A) Laminated rocks
(B) Compact coarse sand
(C) Soft rocks
(D) Granite rocks

27. The type of foundation suitable for under water structures is

(A) Cast in situ concrete piles
(B) Pier foundation
(C) Continuous footing
(D) Stepped foundation

28. The most common sampler used for obtaining a disturbed sample of soil is :

(A) Split spoon sampler
(B) Thin wall shelby tube sampler
(C) Open drive sampler
(D) Piston sampler

29. The ultimate bearing capacity of a surface strip footing on clay, according to Terzaghi's theory is :

(A) $5.7\,c$
(B) $5.14\,c$
(C) $q_u B$
(D) $9\,c$

Where c = unit cohesion, q_u = unconfined compressive strength, and B = width of footing

30. Negative skin friction on a pile under vertical compressive load acts :

(A) Downwards and increases the load carrying capacity of the pile
(B) Downwards and reduces the load carrying capacity of the pile
(C) Upwards and increases the load carrying capacity of the pile
(D) Downwards and maintains the same load carrying capacity of the pile

31. An ideal fluid is one which :

(A) Obeys Newton's law of viscosity
(B) Flows through pipes with least friction
(C) Is frictionless and incompressible
(D) Satisfies continuity equation

32. For a fluid in motion, if pressure at a point is same in all directions, then the fluid is said to be :

(A) A real fluid
(B) A non Newtonian fluid
(C) An ideal fluid
(D) A Newtonian fluid

33. The point at which the resultant pressure on an immersed surface acts on it is known as :

(A) Centre of gravity
(B) Centre of depth
(C) Centre of immersed surface
(D) Centre of pressure

34. A flow in which the velocities of liquid particles at all sections of the pipe or channel are equal is called as :

(A) Uniform flow
(B) Laminar flow
(C) Turbulent flow
(D) Unsteady flow

35. Bernoulli's theorem deals with the principal of conservation of :

(A) Momentum
(B) Energy
(C) Mass
(D) Force

36. Pitot tube is a device used in the Flowing fluid for measurement of :

(A) Discharge
(B) Pressure
(C) Velocity
(D) Kinetic energy

37. A hydrograph is a plot of :

(A) Precipitation against time
(B) Surface run off against time
(C) Recorded run off against time
(D) Stream flow against time

38. Unit hydrograph method for flood estimation is applied to :

(A) Large basins
(B) Hilly areas
(C) Small and medium sized basin
(D) All of the above

39. An aquifer that is confined at bottom and top is :

(A) Partially confined aquifer
(B) Confined aquifer
(C) Unconfined aquifer
(D) Semi-confined aquifer

40. Weirs constructed on permeable foundation are likely to fail due to :

(A) Piping or uplift
(B) Cracking
(C) Crushing
(D) Sliding

41. Rabi crops pertain to :

(A) Monsoon season
(B) Summer season
(C) Winter season
(D) Autumn season

42. Duty of a canal water is expressed in :

(A) Cumecs
(B) Centimetres
(C) Millimetre
(D) Ha per cumec

43. Elementary profile of a gravity dam is :

(A) Trapezoid
(B) Right angled triangle
(C) Square
(D) Pyramid

44. The measure of the amount, to which light is adsorbed or scattered by the suspended material in water, is called :

(A) Colour
(B) Turbidity
(C) pH
(D) Acidity

45. Blue baby disease is caused in infants due to drinking water, containing higher concentrations of :

(A) Nitrates
(B) Cadmium
(C) Sulphides
(D) Chlorides

46. The commonly used indicator for measuring iron concentration in water is :

(A) Sodium thiosulphate
(B) Silver nitrate
(C) Eriochrome black T
(D) 1, 10 phenanthraline

47. The suitable method for distribution system for a city with haphazard growth pattern is :

(A) Ring system
(B) Grid system
(C) Tree system
(D) Reticulated system

48. The settling of particles in a sedimentation tank depends upon :

(A) Length of tank
(B) Width of tank
(C) Depth of tank
(D) Length and width of tank

49. A floatation unit is usually provided to remove :

(A) Suspended solids
(B) Oil and grease
(C) Grit
(D) Stones

50. A commonly used coagulant is :

(A) Sodium
(B) Chlorine
(C) Alum
(D) Lime

51. From septic tank the effluents are discharged into :

(A) Soak pit
(B) Drainage
(C) Oxidation pond
(D) Public sewer

52. The maximum efficiency of BOD removal is achieved in :

(A) Aerated lagoons
(B) Trickling filters
(C) Digestion tank
(D) Oxidation ditch

53. Biochemical oxygen demand of wastewater represent :

(A) Total concentration of biochemical matter
(B) Total organic matter
(C) Concentration of biodegradable organic matter
(D) Concentration of chemically degradable organic matter

54. Bulking of sludge can be controlled by :

(A) Denitrification
(B) Aeration
(C) Coagulation
(D) Chlorination

55. An underground passage used by pedestrians, vehicular traffic etc is known as :

(A) Sub-way
(B) Service road
(C) Fly over
(D) Sidewalk

56. An ideal horizontal transition curve should be a :

(A) Hyperbola
(B) Circle
(C) Spiral
(D) Parabola

57. A road connecting one town with another town is known as :

(A) Main road
(B) Highway
(C) Country road
(D) Ring road

58. The maximum allowable super elevation is :

(A) 1 in 12
(B) 1 in 15
(C) 1 in 18
(D) 1 in 30

59. The best example of a rigid pavement is :

(A) Concrete road
(B) Bitumen road
(C) Gravel road
(D) Water bound macadam road

60. First operation during the detailed survey of a hill road is :

(A) Hydrological and soil survey

(B) Longitudinal survey and cross sectioning

(C) Adjustment of alignment

(D) Fixation of bench marks

61. The maximum design gradient for vertical profile of a road is :

(A) Ruling gradient (B) Limiting gradient

(C) Minimum gradient (D) Maximum gradient

62. Bearing plates are used to fix :

(A) Double headed rails to wooden sleepers

(B) Single headed rails to wooden sleepers

(C) Flat footed rails to wooden sleepers

(D) Flat footed rails to cast iron sleepers

63. Arrangement made to divert trains from one track to another is called :

(A) Railway point (B) Turnout

(C) Railway crossing (D) Railway junction

64. Distance between inner faces of the flanges is kept :

(A) Equal to gauge distance (B) Slightly less than gauge distance

(C) Double amount of gauge distance (D) Slightly more than gauge distance

65. The place where a railway line and a road cross each other at the same Level :

(A) Cross over (B) Railway junction

(C) Level crossing (D) Road junction

66. Gauge of a permanent way is :

(A) Minimum distance between running face of rails

(B) Width of formation

(C) Distance between centres of rails

(D) Distance between outer faces of rails

67. The kind of survey work in which curvature of earth is ignored is called :

(A) Aerial survey
(B) Geological survey
(C) Geodetic survey
(D) Plane survey

68. As per Indian standard specification, the length of one link in 30 metre chain is

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

69. Example for an obstacle that obstructs both chaining and ranging :

(A) River
(B) Hillock
(C) Lake
(D) Building

70. The instrument that is used for measurement of angles :

(A) Geodimeter
(B) Tellurometer
(C) Sextant
(D) Telescope

71. The magnetic bearing of a line is 62° 20' and the magnetic declination at that place is 2° 50' east, then the true bearing of that line will be :

(A) 64° 70'
(B) 60° 30'
(C) 59° 30'
(D) 65° 10'

72. In a plane table survey the plotting of inaccessible points can be done by :

(A) Method of intersection
(B) Method of interpolation
(C) Method of radiation
(D) Method of traversing

73. Mean sea level MSL is established after analysing the tidal fluctuations over a period of :

(A) 10 years
(B) 16 years
(C) 19 years
(D) 50 years

74. A star is observed at its upper culmination when it is north of zenith. The latitude of the place of observation is 30° N and declination of the star is 50° N. The zenith distance of the star is :

(A) 10°
(B) 20°
(C) 40°
(D) 80°

75. The method of levelling in which the heights of mountains are found by observing the temperature at which water boils is known as :

(A) hypsometry
(B) barometric levelling
(C) reciprocal levelling
(D) check levelling

76. The length of a line measured with a 20m chain was found to be 634.4 m. If the chain was 5 cm too long throughout the measurement, then the true length of the line is :

(A) 632.420 m
(B) 635.986 m
(C) 634.420 m
(D) 634.425 m

77. The vertical distance between any two consecutive contours is known as :

(A) Contour line
(B) Contour gradient
(C) Horizontal equivalent
(D) Contour interval

78. Spire test is used in permanent adjustment of a theodolite for :

(A) Adjusting the line of sight
(B) Adjusting the horizontal axis
(C) Adjusting the vertical axis
(D) Adjusting the plate levels

79. The highest value of coefficient of refraction occurs during :

(A) Early morning
(B) Evening
(C) At noon
(D) Afternoon

80. The curve having varying radii and introduced in between a straight and a circular curve is :

(A) Vertical curve
(B) Transition curve
(C) Compound curve
(D) Super elevation

81. Who said "give me blood and I will give you freedom"?

(A) Bagat Singh
(B) Subash Chandra Bose
(C) Lala Lajpat Rai
(D) Dadabhai Naoroji

82. Who is the Chairman of the National Farmers Commission in India?

(A) Goswamy
(B) T.S. Batra
(C) M.S. Swaminathan
(D) Ashok Mehta

83. We have borrowed the concept of "Directive principles of state policy" from the constitution of :

(A) U.S.A.
(B) Canada
(C) U.K.
(D) Ireland

84. Who is the President of France?

(A) Laurent Fabius
(B) Fancois Hollande
(C) Jean Yves Le Drain
(D) Anne Hidalgo

85. The Jallianwala Bagh massacre took place on :

(A) 14th August 1918 (B) 6th March 1920

(C) 13th April 1919 (D) 10th September 1921

86. The festival 'Mamankam' was celebrated once in twelve years at the bank of the river :

(A) Periyar (B) Bharathapuzha

(C) Pampa (D) Chaliyar

87. Dr. B.R. Ambedkar had described which of the fundamental right as "the heart and soul" of the constitution?

(A) Right to equality (B) Right to Freedom

(C) Right to religion (D) Right to constitutional remedies

88. The financial relation between union govt. and states are discussed in the Indian constitution under article :

(A) 266 – 273 (B) 265 – 270

(C) 268 – 281 (D) 270 – 278

89. The name associated with "Misrabhojanam" in Kerala :

(A) Sahodaran Ayyappan (B) T.K. Madhavan

(C) R. Sankar (D) Mannath Padmanabhan

90. "If God were to tolerate untouchability I would not recognise him as God at all"–Who said it?

(A) Dr. Rajendraprasad (B) Lokmanya Tilak

(C) Vinoba Bhave (D) Mahatma Gandhi

91. Who proposed 'the preamble' before the Drafting Committee of the constitution of India?

(A) B.R. Ambedkar (B) K.M. Munshi

(C) Sir Krishnaswami Ayyangar (D) Jawaharlal Nehru

92. "Privy Purse" was abolished by which one of the following constitution Amendment Acts?

(A) 25th (B) 26th

(C) 42nd (D) 44th

93. The Lokayukta and Upalokyukta Act was first passed in :

(A) Maharastra (B) Kerala

(C) Karnataka (D) Odisha

94. The concept of public Interest litigation in India relates to :

(A) Greater Federalism (B) Judicial Supramacy

(C) Accountability (D) Parliamentary Sovereignty

95. Who raised the slogan "Do or Die"?

(A) Bhagath Singh (B) Mahatma Gandhi

(C) Badruddin Tyabjii (D) Sardar Pattel

96. Who says that "every Judge is an activitst, either on the forward gear or on the reverse"?

(A) Justice Hidayathulla (B) Justice Malimath

(C) Justice Krishna Iyer (D) Justice Dipak Misra

97. When a non-member of parliament is inducted into the council of ministers he must become a member of parliament with in?

(A) Three months (B) Six months

(C) Five months (D) Seven months

98. Who was the first Chief Minister of Thiru-Kochi?

(A) A.J. John (B) C. Kesavan

(C) T.K. Narayana Pillai (D) Panambilli Govinda-Menon

99. Which of the following committee suggested the inclusion of a seperate chapter on fundamental duties in the constitution of India?

(A) M.R. Srivastava Committee (B) Swaran Singh Committee

(C) M.K. Kaw Committee (D) Rajinder Sachar Committee

100. "Sadhu Jana Paripalana Yogam" was founded by :

(A) Sree Narayana Guru (B) Dr. Palpu

(C) Chattambi Swamikal (D) Ayyankali