

090/2024

Maximum : 100 marks

Time : 1 hour and 30 minutes

1. What is ENH in input parameters of total station?
 - (A) Easting, Northing, RL of the instrument
 - (B) Easting, Northing, Height of the instrument
 - (C) Easting, Northing, Height of the tripod
 - (D) Easting, Northing, Height of the reflector

2. The magnetic bearing of the line is $70^{\circ}30'$ and the magnetic declination is $2^{\circ}20'$ E. The true bearing of the line will be :
 - (A) $68^{\circ}10'$
 - (B) $72^{\circ}50'$
 - (C) $250^{\circ}30'$
 - (D) $110^{\circ}30'$

3. The back sight reading on a bench mark of reduced level 100.00 is 2.450. If fore sight reading on the point is 1.620, the reduced level of the point is :
 - (A) 103.070
 - (B) 97.550
 - (C) 100.830
 - (D) 102.450

4. The error in measured length due to incorrect holding of the chain is:
 - (A) Cumulative error
 - (B) Compensating error
 - (C) Instrumental error
 - (D) Negative error

5. The projection of a traverse line on a line perpendicular to the meridian is known as :
 - (A) Latitude of the line
 - (B) Departure of the line
 - (C) Bearing of the line
 - (D) Co-ordinate of the line

6. Remote sensing technique are being usefully employed for the purpose of :
 - (A) Improving natural resource management
 - (B) Land use
 - (C) Protection of environment
 - (D) All of these

7. When whole circle bearing of two lines AB and BC are 40° and 120° respectively .Then the included angle ABC = :
 - (A) 180°
 - (B) 80°
 - (C) 100°
 - (D) 60°

8. The two point and three point problems are typical case of :
 - (A) Radiation method
 - (B) Intersection method
 - (C) Traversing method
 - (D) Resection method

9. _____ is a single set of observations made for measuring a horizontal angle between any two points at a station.
- (A) Repetition method (B) Reiteration method
(C) Deflection method (D) Ordinary method
10. The method of contouring suitable for long and narrow strips of land is :
- (A) Square method (B) Direct method
(C) Tacheometric method (D) Cross section method
11. _____ is the built up covered area of a building measured at the floor level.
- (A) Floor area (B) Carpet area
(C) Plinth area (D) Circulation area
12. _____ estimate is prepared for the technical sanction of the competent authority.
- (A) Preliminary (B) Cubical content
(C) Plinth area (D) Detailed
13. _____ is the unit of measurement in MKS system for earthwork excavation in ordinary soil.
- (A) 10 m^3 (B) m^3
(C) m^2 (D) 10 m^2
14. _____ are the essential drawing data required for the preparation of an estimate.
- (A) Plan and section
(B) Elevation and section
(C) Plan and elevation
(D) Plan, sectional elevation and detailed drawings
15. _____ is the technique of estimating or determining the fair price or value of a property such as a building, other engineering structures of various types.
- (A) Scrap value (B) Valuation
(C) Market value (D) Book value
16. Name the temporary framework of bamboo, wood or steel for helping a mason in plastering work :
- (A) shutter (B) scaffold
(C) rake (D) fender
17. What is correct for the plastered surface?
- (1) Maximum period of curing is 7 days
(2) Soaking of wall shall be avoided
(3) Finished plastered surface should not show a deviation more than 3 mm when checked with a straight edge of 2m length
(4) Peeling of the plaster occurs due to the penetration of moisture from outside
- (A) (1), (2), (3), (4) are correct (B) (1), (2), (4) are correct
(C) (2), (3), (4) are correct (D) (1), (2), (3) are correct

18. Under what conditions a strap footing is provided :
- (1) When the footings of two columns overlap each other
 - (2) When there is space limitation for constructing a footing under an exterior column
 - (3) When eccentric loading of columns occurs
 - (4) To transfer load from two or more columns directly to soil through the strap
- (A) (1), (2), (3) and (4) are correct (B) (2) and (4) are correct
(C) (1), (2) and (3) are correct (D) (2) and (3) are correct
19. What is the correct order in the process of concreting?
- (1) Placing
 - (2) Mixing
 - (3) Batching
 - (4) Compacting
 - (5) Curing
- (A) (1), (2), (3), (4), (5) (B) (2), (3), (1), (4), (5)
(C) (3), (2), (1), (4), (5) (D) (3), (1), (2), (4), (5)
20. Portion of the brick cut across the width is called :
- (A) Closer (B) Quoin
(C) Bat (D) Lap
21. The lower edge of the inclined roof surface is called :
- (A) Ridge (B) Hip
(C) Eaves (D) Pitch
22. Which component of a building transmits the load from superstructure to the sub structure?
- (A) Plinth (B) Footing
(C) Lintel (D) Beam
23. Which type of paint is best suited for hot metallic water tank and hot pipes?
- (A) Emulsion (B) Aluminium paint
(C) Distemper (D) Enamel paint
24. Which type of urban road cater to significant amount of traffic between central business district and outlying residential area?
- (A) Expressways (B) Arterial streets
(C) Sub arterial streets (D) Collector streets
25. The IRC recommended minimum camber for cement concrete road at low rainfall area :
- (A) 1 in 30 (B) 1 in 40
(C) 1 in 50 (D) 1 in 60

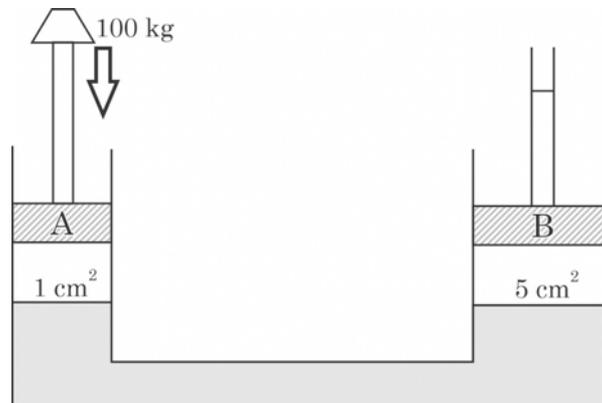
26. The form of bitumen diluted with volatile petroleum based liquids :
- (A) Cutback (B) Emulsion
(C) Asphalt (D) Tar
27. What is the absolute minimum sight distance required through out the length of a road?
- (A) Stopping Sight Distance (B) Passing Sight Distance
(C) Intersection Sight Distance (D) Headlight Sight Distance
28. Find out the grade to be provided for a road with ruling gradient 3.6% on a sharp horizontal curve of radius 60 m. :
- (A) 2.35% (B) 2.1%
(C) 4% (D) 3.6%
29. With Continuous overland flow, the erosive action of water results in the formation of shallow channels called :
- (A) Rills (B) Gills
(C) Sheets (D) Gully
30. The stage at which vegetation growth begins in a gully is called :
- (A) Formation stage (B) Development stage
(C) Healing stage (D) Stabilisation stage
31. Which of the following factors affects soil erosion?
- (A) Climate (B) Topography
(C) Vegetation (D) All of these
32. Consider the following three statements :
- Statement 1 : Soil detachability increases as the size of particle increases.
Statement 2 : Soil transportability decreases with the increase in particle size.
Statement 3 : Soil containing high percentages of sand and silt are more susceptible to detachments.
- Select the right option given below.
- (A) Statement 1 and 2 are True, 3 is false (B) Statement 1, 2 and 3 are false
(C) Only statement 2 is true (D) All statements are true
33. Process of covering external material like fabric, stones etc. for reducing loss of soil moisture is called :
- (A) Sewering (B) Mulching
(C) Disdaining (D) Covered irrigation
34. The traditional method of growing crops on hill sides by slash and burn method is known as :
- (A) Fuming (B) Huming
(C) Jhuming (D) None of these

35. _____ is defined as the maximum permissible rate of erosion at which soil fertility can be maintained over 20-25 years.
- (A) Soil Capacity (B) Soil Maturity
(C) Soil Loss tolerance (D) Soil fertility capacity
36. _____ is defined as the regular succession of different crops being grown on same piece of land.
- (A) Crop rotation (B) Mixed farming
(C) Strip Cropping (D) Cover cropping
37. _____ is defined as the time required for water to flow from hydraulically most remote point of the basin to outlet.
- (A) Time of concentration (B) Isochrone
(C) Time of Discharge (D) Isopleth
38. The line joining points having equal erosivity :
- (A) Isohyet (B) Isoerodent
(C) Isochrone (D) Isotherm
39. Contour bunds are preferred if the annual average rainfall is less than :
- (A) 700 mm (B) 800 mm
(C) 900 mm (D) 1100 mm
40. _____ are provided to prevent the undercutting of apron.
- (A) End sill (B) Cutoff wall
(C) Wing wall (D) Toe wall
41. A diversion head work serves the following functions:
- (i) It raises the water level on its upstream side
(ii) It regulates the supply of water to the canals
(iii) It controls the entry of silt into canals
(iv) It helps in controlling the vagaries of the river
- (A) All options are correct (B) Only (i), (ii) and (iii) are correct
(C) Only (i), (ii) and (iv) are correct (D) Only (i) and (ii) are correct
42. The equation used for calculating the uniformity coefficient of sprinklers is :
- (A) Manning's equation (B) Darcy's equation
(C) Kennedy's equation (D) Christiansen's equation
43. The water stored in a reservoir below the minimum pool level is known as :
- (A) Dead storage (B) Useful storage
(C) Live storage (D) Bank storage

44. The Capacity factor of canals is defined as the ratio of :
- (A) The number of waterings applied to a crop to the design number of applications
 - (B) The mean supply discharge in a canal during a period to its designed full capacity
 - (C) Gross command area to Net command area
 - (D) Net command area to Gross command area
45. Which among the following is not a filter used in drip irrigation system?
- (A) Hydro cyclone filter
 - (B) Disc filter
 - (C) Screen filter
 - (D) Passive filter
46. Using the relation between duty and delta, calculate the delta for a rice crop with base period of 120 days and duty of 1800 hectares per cumec :
- (A) 5.76 m
 - (B) 0.576 m
 - (C) 57.6 m
 - (D) 0.0576 m
47. Which among the following is not a type of earth dam?
- (A) Hydraulic fill dam
 - (B) Rolled fill dam
 - (C) Zoned embankment type dam
 - (D) Phreatic dam
48. The available water is the amount of soil moisture held between :
- (A) Field capacity and Permanent Wilting point
 - (B) Field capacity and Wilting point
 - (C) Saturation capacity and wilting point
 - (D) Saturation capacity and Ultimate wilting point
49. Which of the following group of crops are Kharif crops?
- (A) Paddy, Wheat, Cotton, Maize
 - (B) Paddy, Cotton, Groundnut, Barley
 - (C) Paddy, Cotton, Maize, Ground nut
 - (D) Paddy, Barley, Maize, Sugarcane
50. Which among the following statements are correct?
- (i) Cross drainage structure when canal bed level and drainage bed level are same is called level crossing
 - (ii) Cross drainage structure when canal bed level is lower than the drainage level is called aqueduct
 - (iii) Cross drainage structure when canal bed level is higher than the drainage level is called super passage
 - (iv) A canal siphon is constructed when the full supply level of the canal is above the drainage bed level
- (A) Only (i) and (iv) are correct
 - (B) Only (i) , (ii) and (iii) are correct
 - (C) Only (i) and (ii) are correct
 - (D) All options are correct

51. Among the following statements, which one is correct :
- (A) A canal section is economical when the earthwork involved in cut is more than during fill
 - (B) A canal section is economical when the earthwork involved in fill is more than during cut
 - (C) Balancing depth is the depth of cut for which the amount of cut and fill are equal
 - (D) Balancing depth is the full supply depth of a canal
52. The overland flow in border irrigation is a case of :
- (A) Steady open channel flow
 - (B) Steady open channel flow with decreasing discharge
 - (C) Unsteady open channel flow with increasing discharge
 - (D) Unsteady open channel flow with decreasing discharge
53. A ————— pump causes a fluid to move by trapping a fixed amount of fluid and then forcing the trapped volume of fluid into the discharge pipe.
- (A) Positive displacement
 - (B) Non positive displacement
 - (C) Centrifugal
 - (D) None of the above
54. Which of the following statement/(s) is true?
- (i) Pressure occurs when the flow from the pump is subjected to a resistance
 - (ii) The mechanical action of the pump creates a vacuum at the inlet port, which allows atmospheric pressure to force liquid from the reservoir into the pump.
- Choose from the options given below.
- (A) (i) only
 - (B) (ii) only
 - (C) (i) and (ii)
 - (D) None of the above
55. Which of these fundamental units are used in hydraulics?
- (i) Length
 - (ii) Mass
 - (iii) Time
- (A) (i) and (ii)
 - (B) (i) and (iii)
 - (C) (ii) and (iii)
 - (D) (i), (ii) and (iii)
56. The flow velocity of oil flowing through a hydraulic pipe having 20 mm diameter and a flow rate of 18 litres per minute is :
- (A) $300/\pi$ m/s
 - (B) $300/\pi$ cm/s
 - (C) 300 cm/s
 - (D) 300 m/s

57. In the figure below, a force of 100 kilogram is applied on the smaller cylinder 'A' having cross-sectional area of 1 cm^2 . The force acting perpendicularly on piston B is :



- (A) 100 kg
(B) 500 kg
(C) 500 kg/cm^2
(D) 100 kg/cm^2
58. The constant C in Chezy's formula depends on :
- (i) Size
(ii) Character of slope
(iii) Depth of flow of stream
(iv) Nature of surface of channel
- (A) (i), (ii) and (iii)
(B) (i), (iii) and (iv)
(C) (ii), (iii) and (iv)
(D) (i), (ii), (iii) and (iv)
59. The best hydraulic section of a trapezoidal channel under favourable structural conditions is :
- (A) $b = 2d \tan \theta / 2$
(B) $b = d \tan \theta / 2$
(C) $b = 2d \tan \theta$
(D) $b = d \tan \theta$
60. The size of the openings in a circular free flow orifice range from :
- (A) 2.5 – 5.0 cm
(B) 3.5 – 5.0 cm
(C) 2.5 – 7.5 cm
(D) 3.5 – 7.5 cm
61. In a volute pump, the casing is proportioned to gradually _____ the velocity of the liquid as it flows from the impeller to the discharge.
- (A) Increase
(B) Reduce
(C) Maintain
(D) None of the above
62. Vena contracta is the point of _____ contraction in a fluid stream when it passes through the small hole in the orifice plate.
- (A) Maximum
(B) Least
(C) No
(D) None of the above
63. An average man can develop a maximum power of about _____ hp.
- (A) 746
(B) 0.1
(C) 2.0
(D) 75

64. In tractors, the function of a differential is to :
- (A) Stop power take off shaft
 - (B) Control slippage
 - (C) Rotate one of the rear wheels faster or slower than the other
 - (D) Check fuel supply
65. The inflation pressure of front tyre of a tractor is _____ kg/cm².
- (A) 2.0 – 2.5
 - (B) 2.5 – 3.0
 - (C) 3.0 – 3.5
 - (D) 3.5 – 4.0
66. In computation of depreciation of a tractor, the number of working hours per year is usually taken as :
- (A) 1,000
 - (B) 10,000
 - (C) 5,000
 - (D) 1,500
67. In power tillers, steering clutch is provided :
- (A) On the grip of right and left handle
 - (B) On the right handle
 - (C) On the left handle
 - (D) In front of the driver's seat
68. Calibration of seed drill is essential to validate the :
- (A) Row to row spacing
 - (B) Plant to plant spacing
 - (C) Seed rate
 - (D) Speed of the drill
69. Mechanical efficiency of an IC engine is defined as :
- (A) IHP/BHP
 - (B) BHP/IHP
 - (C) BTE/ITE
 - (D) BHP/ITE
70. The firing order in a 4-cylinder 4-stroke IC engine is :
- (A) 1-2-4-3
 - (B) 1-4-2-3
 - (C) 1-4-3-2
 - (D) 1-2-3-4
71. Ignition quality of diesel fuel is indicated by :
- (A) Cetane number
 - (B) Octane number
 - (C) API degree
 - (D) Calorific value
72. In the fuel injection pump of a diesel engine, the fuel injection timing is adjusted by the :
- (A) Delivery valve
 - (B) Rotation of plunger
 - (C) Tappets
 - (D) Translatory motion of the plunger
73. In a rasp bar thresher, main threshing occurs between :
- (A) Cylinder and concave
 - (B) Cylinder and cutter bar
 - (C) Cutter bar and concave
 - (D) Cylinder and straw walker

74. Hand operated sprayers are operated at pressure ranging from _____ kg/cm².
 (A) 1-7 (B) 10-15
 (C) 16-20 (D) 21-25
75. An ordinary disc harrow has _____ gangs.
 (A) 1 (B) 2
 (C) 3 (D) 4
76. The function of a governor in a tractor engine is :
 (A) Limit the power (B) Limit the travel speed
 (C) Maintain constant engine speed (D) Maximise the fuel economy
77. Field efficiency is the ratio of :
 (A) Actual field capacity/theoretical field capacity
 (B) Theoretical field capacity/actual field capacity
 (C) Drawbar power/P.T.O. power
 (D) Tractive force/work done
78. Sphericity is a measure of :
 (A) Density (B) Length- breadth ratio
 (C) Shape (D) None of the above
79. In a spray dryer, _____ separator is employed to separate the milk powder from air - milk powder mixture.
 (A) Velvet roll (B) Cyclone
 (C) Spiral (D) Filter cloth
80. Destoner is used for separating stones from grains based on :
 (A) Difference in size (B) Difference in terminal velocity
 (C) Difference in colour (D) Difference in specific gravity
81. Centrifugal dehusker shells paddy due to _____ force.
 (A) Compression (B) Impact
 (C) Friction (D) Shear
82. In pulse milling industry, which of the following is used for conditioning of pulses?
 (A) Water (B) Red earth
 (C) Lin seed oil (D) All the above

83. Rice bran stabilization is a thermal treatment done for :
(A) Bleaching of bran (B) Extracting oil from bran
(C) Reducing lipase enzymatic activity (D) None of the above
84. In a psychrometric chart, the curved lines represent :
(A) Constant dry bulb temperature (B) Constant relative humidity
(C) Constant specific volume (D) Constant humidity ratio
85. The commonly used refrigerant in ice plant is :
(A) NH_3 (B) CO_2
(C) R-12 (D) None of the above
86. Aseptic packaging is normally employed after which of the following processing method :
(A) Drying (B) Freezing
(C) UHT pasteurization (D) Frying
87. The permeability of plastic film follows :
(A) Fourier's law (B) Fick's law
(C) Newton's law (D) Einstein's law
88. Which of the following gas is normally employed during packaging of vegetable chips?
(A) Oxygen (B) Carbon dioxide
(C) Hydrogen (D) Nitrogen
89. Centrifugal discharge is employed in :
(A) Bucket elevator (B) Screw conveyor
(C) Chain conveyor (D) Belt conveyor
90. In summer air conditioning, the air is :
(A) Heated and humidified (B) Cooled and humidified
(C) Heated and dehumidified (D) Cooled and dehumidified
91. Which of the following is commercially used for the preparation of ice cream?
(A) Fluidized bed freezer (B) Scraped surface freezer
(C) Immersion freezer (D) Air blast freezer
92. Which law of thermodynamics explains the conservation of energy?
(A) First (B) Second
(C) Third (D) None of the above

93. _____ is the part of sewage that settles at the bottom of the septic tank after being acted upon by bacteria.
- (A) Scum (B) Sewage
(C) Sludge (D) Smudge
94. The common type of barns used in modern dairy farms having large herds, with facilities for handling large number of cattle in one barn unit, individual feeding, and management of animals is called :
- (A) Loose house barn (B) Open air barn
(C) Stanchion barn (D) None of the above
95. A floor area of _____ per bird is usually provided in deep litter poultry housing.
- (A) 0.26 sq. m (B) 0.36 sq.m
(C) 0.16 sq.m (D) 0.10 sq.m
96. A bin whose relative dimensions are such that the plane of rupture meets the opposite side before it emerges from the grain is called :
- (A) Shallow grain bin (B) Deep grain bin
(C) Silo (D) None of the above
97. The depth of septic tank should be such that the liquid depths range from :
- (A) 0.75 m – 1.5 m (B) 0.75 m – 1.0 m
(C) 0.50 m – 1.5 m (D) 0.50 m – 1.0 m
98. The optimum C/N ratio to be maintained in a biogas plant for efficient functioning is :
- (A) 10 : 1 (B) 20 : 1
(C) 25 : 1 (D) 30 : 1
99. Storage fungi that affect seeds grows most rapidly at :
- (A) 20-22 °C (B) 25-30 °C
(C) 30-32 °C (D) 35-40 °C
100. _____ is a cylindrical shaped traditional grain storage structure made of mud and split bamboos.
- (A) Morai (B) Bukhari
(C) Kothar (D) None of the above
-

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK