1. In a company the annual usage value of 400 units, the procurement cost is Rs.20 per order, the cost per piece is Rs.100 and the cost of carrying inventory is 10%. Calculate the EOQ

(A) 50

(B) 60

(C) 40

(D) 80

(E) Answer not known

2. If orders are placed with size determined by the EOQ, then the reorder costs component is

(A) Equal to the holding cost component

(B) Greater than the holding cost component

(C) Less than the holding cost component

(D) Equal to the carrying cost

(E) Answer not known

3. Match the following :

(a)	Standard order	1.	Volume of frequency of order to satisfy the demand
(b)	Reorder point	2.	Economical purchase inventory size
(c)	Ordering cost	3.	High time to initiate a purchase orders
(d)	Total cost	4.	Number of orders/ annual demand
(e)	EOQ	5.	(Fixed cost + variable cost) × units

	(a)	(b)	(c)	(d)	(e)
(A)	2	3	4	5	1
(B)	3	4	5	1	2
(C)	4	5	1	2	3
(D)	5	2	4	3	1

(E) Answer not known

4. In blanking operation the clearance provided is

(A) 50% on punch and 50% on die

(B) on die

(C) on punch

(D) on die (or) punch depending upon designers choice

(E) Answer not known

5. Find the right statement for high speed steel

(A) High resistance to decarburization

(B) Poor wear resistance

(C) Low non-deforming property

(D) Good shock resistance

(E) Answer not known

6. Match the following :

(a)	Submerged arc welding	1.	Very high welding productivity with multiple electrode
(b)	Gas metal-arc welding	2.	Operating temperature is 33000 °C
(c)	Flux-cored arc welding	3.	Primary and supplementary shielding gas are used
(d)	Electrogas welding	4.	Small droplets of molten metal
(e)	Plasma – arc welding	5.	Tubular electrode with very small diameter

	(a)	(b)	(c)	(d)	(e)
(A)	1	3	5	2	4
(B)	4	5	3	1	2
(C)	4	5	1	2	3
(D)	1	4	5	3	2

(E) Answer not known

7. Match the following :

(a)	Aluminium	1.	Alloy of copper other than nickel (or) zinc
(b)	Silicon bronzes	2.	Silvery white metal
(c)	Brass	3.	Good conductor of heat
(d)	Bronzes	4.	Used for bearings
(e)	Magnesium	5.	Greater strength than copper

	(a)	(b)	(c)	(d)	(e)
(A)	5	4	2	1	3
(B)	3	4	5	1	2
(C)	2	4	1	5	3
(D)	3	5	1	2	4

(E) Answer not known

8. The power is delivered to the shaft by _____.

(A) tangential force
(B) axial force
(C) linear force
(D) longitudinal force
(E) Answer not known

9. The loss of head due to bend in pipe is $kV^2 / 2g$. The value of k depends on _____.

(A) Length of pipe
(B) Diameter of pipe
(C) Internal surface roughness
(D) Co-efficient of friction
(E) Answer not known

10. Find the correct statement for Bernoulli's equation

(A) $\frac{p}{\rho}+\frac{V^2}{2g}+z=\text{Constant}$

(B) $\frac{p}{2\rho}+\frac{V^2}{g}+z=\text{Constant}$

(C) $\frac{p}{\rho g}+\frac{V^2}{2g}+z=\text{Constant}$

(D) $\frac{p}{2g}+\frac{V^2}{\rho g}+z=\text{Constant}$

(E) Answer not known

11. Guest's theory is used for _____

(A) Plastic materials

(B) Elastic materials

(C) Ductile materials

(D) Brittle materials

(E) Answer not known

12. For a two-dimensional flow field, the equation of a stream line is given as

(A) $\frac{u}{dx}=\frac{dy}{v}$

(B) $\frac{dy}{dx}+\frac{dv}{dy}$

(C) $\frac{dy}{u}=\frac{dx}{u}$

(D) $\frac{dx}{u}=\frac{dy}{v}$

(E) Answer not known

13. Cavitation can takes place in case of

(A) Pelton wheel

(B) Kaplan turbine

(C) Reciprocating pump

(D) Centrifugal pump

(E) Answer not known

14. Reciprocating pumps are most suited where

(A) Constant heads are required on mains despite fluctuation in discharge

(B) Operating speeds are much high

(C) Constant supplies are required regardless of pressure fluctuations

(D) Operating speeds are much less

(E) Answer not known

15. The center of gravity of a trapezium with parallel sides a and b is at a distance of _____ measured from the side b.

(A) $\frac{h}{3} \times \left(\frac{b - 2a}{b + a} \right)$

(B) $\frac{h}{3} \times \left(\frac{b + 2a}{b - a} \right)$

(C) $\frac{h}{3} \times \left(\frac{b + a}{b + 2a} \right)$

(D) $\frac{h}{3} \times \left(\frac{b + 2a}{b + a} \right)$

(E) Answer not known

16. Equilibrium of a rigid body in statics refers to

(A) Balance of forces in static condition

(B) Balance of both forces and moments in static condition

(C) Balance of energy of the body

(D) Balance of inertia force and inertia moment

(E) Answer not known

17. A wheel starting from rest is accelerated at the rate of 2 rad/s^2 for an interval of 10s. If it is then made to stop in the next 5s by applying the brakes. Find the maximum angular velocity attained.

(A) 90 rad
(B) 100 rad
(C) 110 rad
(D) 120 rad
(E) Answer not known

18. The work done by a rigid body on which a torque of 200 N-m is applied and is opposed with a 50 N-m frictional torque for completing 3.5 revolutions is _____.

(A) 32.98 kJ
(B) 3.298 kJ
(C) 329. 8 kJ
(D) 3298 kJ
(E) Answer not known

19. Which of the following forms the basis of rigid bodies and strength of materials?

(A) Centroid
(B) Centre of gravity
(C) Moment of Inertia
(D) Section modulus
(E) Answer not known

20. Which of the following theories is suitable for ductile materials?

(A) Maximum principal stress theory
(B) Distortion energy theory
(C) Maximum principal strain theory
(D) Maximum shear stress theory
(E) Answer not known

21. FIRB method of planting sugarcane stands for _____.

(A) Fertilizer irrigation rotation and broadcasting
(B) Furrow irrigation by raised beds
(C) Fast irrigation rainwater basin
(D) Field irrigation and runoff balance
(E) Answer not known

22. The type of threshing cylinder is best for delicate grains requiring gentle threshing is _____.

(A) Rasp bar cylinder
(B) Smooth cylinder
(C) Spike tooth cylinder
(D) Wire tooth cylinder
(E) Answer not known

23. The _____device is commonly used in cotton picker for cotton harvesters.

(A) Brush
(B) Spindle
(C) Roller
(D) Plow
(E) Answer not known

24. The inertia shaker is attached to _____ part of tree during harvesting.

(A) Roots
(B) Branches/trunk
(C) Leaves
(D) Fruits
(E) Answer not known

25. The crop residue includes _____

(A) Only roots
(B) Fruits and seeds
(C) Leaves, stalks and straw left after harvest
(D) Water and mineral
(E) Answer not known

26. The element which helps to keep the solution uniformly mixed in the tank is _____

(A) Agitator
(B) Boom
(C) Valve
(D) Pump
(E) Answer not known

27. The power source which is commonly used to operate agricultural movers is _____

(A) Manual hand push only
(B) Animal power
(C) Wind power
(D) Tractor PTO (Power Take Off)
(E) Answer not known

28. The calibration of sprayer should be done _____

(A) Once per year
(B) Only after the repair
(C) Only when the Sprayer is new
(D) Before every spraying operation
(E) Answer not known

29. The flow rate of nozzle is given by $Q = \frac{A \times S \times W}{C}$, where A-Area to be sprayed, S→ Speed of the Sprayer, W→nozzle spacing, C-Constant for unit conversion:
Identify the correct statement below:

(A) Decreasing the Sprayer Speed (S), will increase flow rate (Q)
(B) Increasing Constant (C), will decrease flow rate (Q)
(C) The flow rate (Q), is independent of nozzle spacing (W)
(D) Decreasing the area (A), will increase flow rate (Q)
(E) Answer not known

30. The spray angle of hollow cone nozzle is _____

(A) 30° to 120°
(B) 10° to 30°
(C) 120° to 160°
(D) 5° to 15°
(E) Answer not known

31. The length of Khurpi blade used for manually operated weeder tool is in the range of _____.

(A) 8-10 cm
(B) 10-14 cm
(C) 150-250 mm
(D) 25-30 cm
(E) Answer not known

32. The number of rows transplanted by self-propelled rice transplanters are _____

(A) 1-2 rows
(B) 5-8 rows
(C) 10-12 rows
(D) More than 20 rows
(E) Answer not known

33. The best sowing method suitable for paddy cultivation in wetland area is _____.

(A) Broadcasting
(B) Dibbling
(C) Drilling
(D) Transplanting
(E) Answer not known

34. If the rotor blade configuration of rotavator increases, the blade cut is affected by _____.

(A) increases
(B) decreases
(C) no effect
(D) becomes zero
(E) Answer not known

35. _____ equipment is commonly used to breakup compacted soil layer.

(A) Rotavator
(B) Subsoiler
(C) Harrow
(D) Combine
(E) Answer not known

36. The type of mould board plough share which is considered most economical and is typically used in light soil is _____

(A) Shin share
(B) Slip nose share
(C) Slip share
(D) Bar point share
(E) Answer not known

37. The primary use of shovels is _____

(A) Cutting grass
(B) Digging holes and moving dirt
(C) Planting seeds
(D) Measuring land
(E) Answer not known

38. The working depth of hand operated cultivator is _____

(A) 0.5 to 1 cm
(B) 10 to 15 cm
(C) 4 to 5 cm
(D) 15 to 20 cm
(E) Answer not known

39. The main purpose of using an indigenous plough is _____

(A) Harvesting crops
(B) Breaking and turning soil
(C) Irrigating fields
(D) Applying fertilizers
(E) Answer not known

40. The standard disc spacing and disc diameter used in an offset disc harrow are _____

(A) 10-15 cm and 30-45 cm
(B) 15-20 cm and 40-45 cm
(C) 20-25 cm and 45-60 cm
(D) 25-30 cm and 65-80 cm
(E) Answer not known

41. Which one of the following is not the preserved form of coconut?

(A) Canned cream
(B) Canned coconut milk
(C) Desiccated coconut
(D) Coconut gratings
(E) Answer not known

42. Coffee powder is normally added with _____.

(A) Chicory
(B) Tamarind seed powder
(C) Husk of ragi
(D) Cocoa powder
(E) Answer not known

43. The method which involves alteration of concentration of normal atmospheric gases present in a storage to prevent insect, mould growth and quality deterioration in the stored product is called as

(A) Modified atmosphere storage
(B) Cover and plinth storage
(C) Catch and pack storage
(D) Mediated advantageous storage
(E) Answer not known

44. Durability of structure and gas tightness is of prime importance for safe and quality storage of grains on the basis of _____.

(A) construction materials
(B) aeration system
(C) stacking order
(D) loading and unloading procedures
(E) Answer not known

45. When high capacity gravitational outflow is needed, _____ type of storage bins are preferred.

(A) Vertical
(B) Horizontal
(C) Circular
(D) Hexagonal
(E) Answer not known

46. Screw conveyor may be designed for clockwise or counter clockwise rotation. The change in direction of rotation does not affect the _____.

(A) Discharge position
(B) Capacity
(C) Conveyance direction
(D) Direction and position of discharge
(E) Answer not known

47. The screw conveyor is generally used to move grains horizontally. However, it can also be used at any angle upto _____ from the horizontal plane.

(A) 90°
(B) 120°
(C) 145°
(D) 45°
(E) Answer not known

48. The sequential unit operations involved in parboiling of paddy is

(i) Soaking

(ii) Drying

(iii) Steaming

(A) (i), (ii) and (iii)
(B) (i), (iii) and (ii)
(C) (ii), (i) and (iii)
(D) (iii), (i) and (ii)
(E) Answer not known

49. Match the following :

(a)	Head rice	1.	less than $\frac{1}{8}$
(b)	Big brokens	2.	$\frac{1}{8}$ to $\frac{4}{8}$
(c)	Small brokens	3.	$\frac{4}{8}$ to $\frac{6}{8}$
(d)	Points	4.	$\frac{6}{8}$ size

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

(E) Answer not known

50. Which of the following statements are true about rubber roll Sheller?

(i) Rubber Rolls rotating in opposite direction

(ii) Rubber Rolls rotating in differential speed

(iii) Rubber Rolls rotating in same speed

(iv) Rubber Rolls rotating in same direction

(A) (i) and (ii)
(B) (i) and (iii)
(C) (ii) and (iv)
(D) (iii) and (iv)
(E) Answer not known

51. Dhal from _____ milling method is said to be of better cooking quality.

(A) wet
(B) dry
(C) oil
(D) chemical
(E) Answer not known

52. Screen separation of grains based on the _____ of grains.

(A) size
(B) shape
(C) colour
(D) moisture content
(E) Answer not known

53. Match the following :

(a)	Heating	1.	Removal of moisture from the air
(b)	Humidifying	2.	Addition of moisture in the air
(c)	Dehumidifying	3.	Raising dry bulb temperature

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

(E) Answer not known

54. Which of the following statements are true about adiabatic drying process?

(i) There is decrease in the value of dry bulb temperature

(ii) Humidity ratio, relative humidity and dew point temperature increase

(iii) Wet bulb temperature and enthalpy remain constant

(iv) Water vapour pressure decreases

(A) (i) only

(B) (i) and (ii)

(C) (i), (ii) and (iii)

(D) (i), (iii) and (iv)

(E) Answer not known

55. The value of moisture ratio lies between

(A) 0 to 1
(B) 1 to 10
(C) 10 to 100
(D) 0.1 to 10
(E) Answer not known

56. The instrument used to measure the dry bulb and wet bulb temperatures at some instant is

(A) Sling psychrometer
(B) Wet bulb thermometer
(C) Dry bulb thermometer
(D) Anemometer
(E) Answer not known

57. Match the following methods of moisture estimation with the properties of food grains :

(a) Electrical resistance method
(b) Dielectric method
(c) Chemical method

1. Capacitance
2. Desiccants
3. Electrical conductivity

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

(E) Answer not known

58. Identify the following property which is not the frictional property of the food grains

(A) Density

(B) Coefficient of internal friction

(C) Angle of repose

(D) Angle of internal friction

(E) Answer not known

59. Match the following :

(a) Elasticity	1. Newtonian body
(b) Plasticity	2. St. Venant body
(c) Viscosity	3. Hookean body

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

(E) Answer not known

60. Match the following methods of moisture estimation with the principal components related to the method :

(a) Air oven method	1. Lamp
(b) Vacuum oven method	2. Mineral oil
(c) Brown duvel fractional distillation method	3. 25 mm of Hg
(d) Infrared method	4. Heating coils

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

(E) Answer not known

61. In remote sensing _____ means how often the sensor records the imagery of the same area.

(A) Spectral resolution
(B) Spatial resolution
(C) Temporal resolution
(D) Radial resolution
(E) Answer not known

62. _____ is a power tool to model hydrological processes in the catchments and command areas of river systems.

(A) DEM
(B) DTM
(C) CAD
(D) GIS
(E) Answer not known

63. The principal atmospheric windows lie in the _____ infrared spectrum.

(A) Invisible
(B) Visible
(C) Arbitrary
(D) Radiant
(E) Answer not known

64. _____ are used in radars for remote sensing.

(A) Passive sensors
(B) Active sensors
(C) Imaging sensors
(D) Non imaging sensors
(E) Answer not known

65. An imagery contains large amount of _____ which cannot be processed without a computer.

(A) Atmospheric effects
(B) Parallax error
(C) Stereoscopic error
(D) Data
(E) Answer not known

66. _____ are effective in either in retaining (or) retarding the runoff.

(A) Narrow gullies
(B) Deep gullies
(C) Ravine
(D) Gully plugs
(E) Answer not known

67. The volume of the farm pond is calculated using _____.

(A) Thumb rule
(B) Volume rule
(C) Cubic rule
(D) Trapezoidal and Simpsons rule
(E) Answer not known

68. _____ and vertical gully heads results in undercutting (or) caving.

(A) Narrow
(B) Small
(C) Medium
(D) Very deep
(E) Answer not known

69. The practical solution to seepage loss is _____ of the pond.

(A) Lining
(B) Emptying
(C) Reducing the storage volume
(D) Reducing the water level
(E) Answer not known

70. Which of the following method is most suitable when the water scarcity and where drainage is excess

(A) Flood Irrigation
(B) Over watering
(C) Excessive tillage
(D) Drip Irrigation
(E) Answer not known

71. A _____ include maintains and hills.

(A) Erosion
(B) Divide
(C) Hydrological unit
(D) Water shed
(E) Answer not known

72. In undulating hilly terrains where intensive agricultural development is involved _____ are preferred.

(A) Large size watersheds
(B) Small size watersheds
(C) Micro watersheds
(D) Sub watersheds
(E) Answer not known

73. The centrally sponsored programme for the integrated development of Western Ghat region was launched during _____.

(A) 1974 to 1975
(B) 1975 to 1976
(C) 1976 to 1977
(D) 1977 to 1978
(E) Answer not known

74. _____ are used to know about the available resources of watershed.

(A) Social maps
(B) Seasonal maps
(C) Google maps
(D) Resource maps
(E) Answer not known

75. _____ can be done using aerial photographs and stereovision in the land capability survey of watershed.

(A) Soil Analysis
(B) Green land analysis
(C) Forest land analysis
(D) Slope analysis
(E) Answer not known

76. The typical temperature _____ is the range for the transesterification process.

(A) 10 – 30°C
(B) 50 – 70°C
(C) 90 – 110°C
(D) 120 – 150°C
(E) Answer not known

77. _____ method can help to minimize the environmental impacts of energy plantations.

(A) Monoculture planting
(B) Sustainable land management practices
(C) Clear-cutting large areas
(D) Using excessive chemical fertilizers
(E) Answer not known

78. For conversion of starchy crops to ethanol which of the following is essential

(A) Yeast only
(B) Molds only
(C) Yeast and molds
(D) Yeast and enzymes
(E) Answer not known

79. Estimate the amount of pure sugar required (in kg) to generate a liter of pure ethanol following the equation

$$C_6H_2O_6 + \text{Yeast} \rightarrow 2C_5H_5OH + 2CO_2 + \text{heat}$$

(A) 1.54
(B) 3.08
(C) 0.752
(D) 6.16
(E) Answer not known

80. Which type of turbine is suitable for very high head above 500 m?

(A) Pelton wheel
(B) Fransis turbine
(C) Kaplan turbine
(D) Straflo turbine
(E) Answer not known

81. The asthenosphere consists of

(A) The crust and the upper mantle
(B) The upper mantle and the lower mantle
(C) The lower mantle alone
(D) The lower mantle and the core
(E) Answer not known

82. A progressive sea wave has a wave width of 100 m and a wave length of 40 m in a period of 5 seconds. The wave velocity and wave area respectively are

(A) 8 m/s, 4000 m^2
(B) 4000 m/s, 8 m^2
(C) 200 m/s, 2.5 m^2
(D) 2.5 m/s, 200 m^2
(E) Answer not known

83. The Average theoretical power generated from a single-basin single effect tidal scheme during one filling where the area of the basin is 100 m^2 and the range of the tide is 10 m.

(A) 225 kW
(B) 225 MW
(C) 450 kW
(D) 450 MW
(E) Answer not known

84. Bio mass briquettes can replace _____ grade coal used in industrial boilers.

(A) A
(B) B
(C) C
(D) D
(E) Answer not known

85. Arrange the following processes sequentially for the production of biogas

(i) Acetogenesis
(ii) Acidogenesis
(iii) Hydrolysis
(iv) Methanogenesis

(A) (i), (ii), (iii), (iv)
(B) (iii), (ii), (i), (iv)
(C) (iii), (i), (ii), (iv)
(D) (ii), (i), (iii), (iv)
(E) Answer not known

86. The overall efficiency of biomass combustion system, when a biomass heating value 18 MJ/kg is fed at a rate of 2 tonnes/hour yields 3 MW power.

(A) 30% (B) 60%

(C) 50% (D) 40%

(E) Answer not known

87. Pyrolysis is a thermal _____ distillation process in the _____ of oxidant.

(A) destructive, absence (B) constructive, absence

(C) destructive, presence (D) constructive, presence

(E) Answer not known

88. _____ is the function of the anemometer on a wind turbine.

(A) Measure current flow (B) Measure rotor speed

(C) Measure wind speed (D) Control blade angle

(E) Answer not known

89. Wind turbines with horizontal axis require _____ device orient them.

(A) Generator (B) Yaw mechanism

(C) Gear box (D) Tower

(E) Answer not known

90. Wind speed data are recorded by data loggers at a height of

(A) 10 m only
(B) 20 m only
(C) 10 m and 20 m
(D) 15 m only
(E) Answer not known

91. $$\frac{\text{Maximum power extracted by the turbine rotor}}{\text{Total wind energy, in the area swept by the rotor}} = 0.593$$

This relation is called

(A) Blitz limit
(B) Bitz limit
(C) Billz limit
(D) Biltz limit
(E) Answer not known

92. The sun at Zenith is the position of the sun

(A) directly over head
(B) at the horizon
(C) below the horizon when the light can be seen but the sun cannot be seen
(D) behind the clouds when the light can be seen but the sun cannot be seen
(E) Answer not known

93. The maximum concentration ratio of a 3D solar collector dish having a compound curvature is about _____ considering that the sun is subtend at an angle of 0.5°.

(A) 40000
(B) 400000
(C) 4000
(D) 4000000
(E) Answer not known

94. The boost the heat transfer in the solar heater

(i) The contact area of air with the transparent cover is to be increased

(ii) The contact area of air with the absorber plate is to be increased

(iii) The contact area of air with the insulator is to be increased

(iv) The contact area of air with the supporting structure is to be increased

Which of the above statement(s) is(are) true?

(A) (ii) only

(B) (ii) and (iii) only

(C) (i), (ii), (iii) and (iv)

(D) (iii) only

(E) Answer not known

95. Which of the following factors do not contribute to the fill factor of solar cells?

(i) Current at maximum power

(ii) Voltage at maximum power

(iii) Incident solar flux

(iv) Area of solar cell

(v) Open circuit voltage

(vi) Short circuit voltage

(A) (iii) and (iv) only
(B) (v) and (vi) only
(C) (i) and (ii) only
(D) (i) and (iii) only
(E) Answer not known

96. _____ is more effective for reducing the impact of wind movement than the wind break.

(A) Vegetative measures
(B) Permanent measures
(C) Shelter belt
(D) Textural change
(E) Answer not known

97. Universal Soil Loss Equation (USLE) does not compute the _____.

(A) Soil loss
(B) Soil deposition
(C) Cropping area
(D) Overland flow
(E) Answer not known

98. Universal Soil Loss Equation (USLE) was developed for _____ fields to determine the soil loss.

(A) Large size
(B) Small size
(C) Watershed of Large size
(D) Average size
(E) Answer not known

99. _____ dunes are sandy crescents.

(A) Parabolic
(B) Crescent
(C) Fixed
(D) Barchans
(E) Answer not known

100. In the design of pipe spillway when the conduit slope is greater than the natural slope and outlet is not submerged in such case the discharge of spillway may be calculated as _____.

(A) $Q = a\sqrt{c2gh}$
(B) $Q = ac\sqrt{2gh}$
(C) $Q = a\sqrt{2gh}$
(D) $Q = ag\sqrt{2h}$
(E) Answer not known

101. For watershed area less than 4 hectare the choice spillway preferred is _____.

(A) Mechanical Spillway

(B) Combined Mechanical and Vegetative Spillway

(C) Vegetative Spillway

(D) Ogee spillway

(E) Answer not known

102. In the design of stilling basin of drop spillway all types of _____ are taken into considerations.

(A) Jumps (B) Forces

(C) Effects (D) Twist

(E) Answer not known

103. The formula used for determining the spacing of bund is _____.

(A) $V.I = \frac{a}{s} + b$ (B) $V.I = \frac{a}{s} - b$

(C) $V.I = \frac{s}{a} + b$ (D) $V.I = \frac{s}{a} - b$

(E) Answer not known

104. _____ is the measure to control soil erosion in areas of high intensity rainfall and with steep slope.

(A) Diversion (B) Terracing

(C) Waterway (D) Stone wall

(E) Answer not known

105. _____ bench terraces are generally used in the areas which receive medium rainfall and having highly permeable soils.

(A) Sloping inward
(B) Sloping outward
(C) Level
(D) Orchard type
(E) Answer not known

106. The provision of _____ is provided in high rainfall areas to dispose of the excess rainwater quickly.

(A) Terrace length
(B) Terrace gradient
(C) Terrace spacing
(D) Terrace cross section
(E) Answer not known

107. In severe erosion the range of annual soil loss varies from _____.

(A) 0.05 to 0.20 mm
(B) 0.5 to 0.20 mm
(C) 5 to 20 mm
(D) 5 to 200 mm
(E) Answer not known

108. In low rainfall areas the purpose of contour cultivation is to _____.

(A) Conserve rainwater
(B) Reduce soil erosion
(C) Reduce overland flow erosion
(D) Soil loss
(E) Answer not known

109. _____ can be more effective for controlling soil erosion accompanied with strip cropping.

(A) Wind strip cropping
(B) Crop rotation
(C) Mulching
(D) Tilling
(E) Answer not known

110. Cover crops are also known as _____ crops.

(A) Green manure
(B) Fast growing
(C) High yielding
(D) Inter planting
(E) Answer not known

111. A miniature green house is known as _____.

(A) Glass house
(B) Hot frame
(C) Cold frame
(D) Frame work
(E) Answer not known

112. Water logging is caused by _____ conditions.

(A) Natural conditions only
(B) Artificial conditions only
(C) Both artificial and Natural conditions
(D) Due to rainfall only
(E) Answer not known

113. _____ is defined as the depth of water in centimetres (or) inches to be removed in 24 hours from the entire drainage area.

(A) Coefficient of discharge
(B) Hydraulic coefficient
(C) Drainage coefficient
(D) Gradient coefficient
(E) Answer not known

114. _____ drains do not interfere with movement of farm implements and cultivation practices.

(A) Open
(B) Sub surface
(C) Surface
(D) Bedding
(E) Answer not known

115. _____ drains are temporary in nature and last for 2 to 3 seasons.

(A) Mole
(B) Pole (or) bamboo
(C) Stone
(D) Wells
(E) Answer not known

116. Blind inlets are called _____.

(A) American drains
(B) Greek drains
(C) French drains
(D) London drains
(E) Answer not known

117. Exchangeable Sodium Percentage (ESP) of alkali soils is more than _____.

(A) 1.5
(B) 15
(C) 16
(D) 18
(E) Answer not known

118. _____ reduce the harmful effects of salinity on plant by creating a more favourable and balanced ionic environment near the root zone.

(A) Potassium and Sodium
(B) Sodium and Boron
(C) Boron and Fluron
(D) Potassium and Nitrate
(E) Answer not known

119. The processes that may be adopted in a situation when fresh water availability is extremely inadequate for drinking

(A) Distillation
(B) Ion exchange
(C) Freezing
(D) Desalination
(E) Answer not known

120. In leaching method _____ are employed when the soil level.

(A) Sprinkler Irrigation
(B) Drip and Surface method
(C) Rectangular checks and level borders
(D) Contour checks and basin flooding
(E) Answer not known

121. Perennial Canals is also known as _____.

(A) Feeder Canal
(B) Conveyance Canal
(C) Distribution Canal
(D) Permanent Canal
(E) Answer not known

122. _____ canal has its alignment confirming generally to the contour of the country.

(A) Ridge
(B) Contour
(C) Side slope
(D) Detour
(E) Answer not known

123. The minimum recommended side slope of channel constructed by cutting in sandy soil (or) gravel is _____.

(A) 1:1 to 1:2
(B) 1:1 to 1.5:1
(C) 1.5:1 to 1:1
(D) 1:1 to 2:1
(E) Answer not known

124. In lined canals _____ section of canal has higher silting carrying capacity.

(A) Trapezoidal
(B) Circular
(C) Oval
(D) Horse shoe type
(E) Answer not known

125. The minimum rent dimension of a culvert is _____.

(A) 0.075 m
(B) 0.75 m
(C) 7.5 m
(D) 7.5 cm
(E) Answer not known

126. _____ is the plinth area less the area occupied under the walls.

(A) Carpet area
(B) Floor area
(C) Plinth area
(D) Builtup area
(E) Answer not known

127. Steel roof trusses are always preferred for a span of _____.

(A) 8 to 9 m
(B) 9 to 10 m
(C) 10 to 11 m
(D) 11 to 12 m
(E) Answer not known

128. The size of the foundation should be determined on the basis of _____ of the soil in which it is built.

(A) Saturation pressure
(B) Passive pressure
(C) Active pressure
(D) Bearing pressure
(E) Answer not known

129. The sum of suction head and delivery head is known as _____.

(A) Man-metric head
(B) Delivery head
(C) Overall efficiency
(D) Static head
(E) Answer not known

130. In cow stall the floor finishing should be a _____ surface.

(A) Slip
(B) Non slip
(C) Smooth finished
(D) Polishly finished
(E) Answer not known

131. _____ supply the largest part of the water required by crop plant in most of the places, particularly under humid climate.

(A) Artificial sources
(B) Natural sources
(C) Spring water
(D) Artesian wells
(E) Answer not known

132. _____ comprise the largest fraction of soil and exist in the form of particles of different sizes and shapes.

(A) Gaseous matters
(B) Liquid matters
(C) Organic matters
(D) Mineral matters
(E) Answer not known

133. _____ soil gives a talcum powder feeling when rubbed between fingers.

(A) Dry clay loam
(B) Dry silt loam
(C) Dry loam
(D) Clay loam
(E) Answer not known

134. The amount of water absorbed by the active absorption is usually less than _____ of the total water required.

(A) 0.05%
(B) 0.5%
(C) 5%
(D) 50%
(E) Answer not known

135. _____ duty of water is measured at the source of diversion of irrigation supplies.

(A) Nominal
(B) Designed
(C) Gross
(D) Economic
(E) Answer not known

136. _____ is a widely practised method of irrigation in India.

(A) Free flooding
(B) Wild flooding
(C) Ordinary flooding
(D) Check flooding
(E) Answer not known

137. _____ irrigation was first introduced in Israel.

(A) Sprinkler
(B) Surface
(C) Border
(D) Drip
(E) Answer not known

138. 90% of water application efficiency is achieved by _____ irrigation.

(A) Sprinkler irrigation
(B) Basin flooding
(C) Drip irrigation
(D) Furrow irrigation
(E) Answer not known

139. The part of precipitation falling during the growing period of a crop which is available in form of consumptive use of the crop is known as _____.

(A) Rainfall
(B) Effective rainfall
(C) Cumulative rainfall
(D) Runoff water
(E) Answer not known

140. Kharif season of crops is for _____ days.

(A) 182
(B) 181
(C) 180
(D) 183
(E) Answer not known

141. Standard size of Bore well drilling below the ground level ranges from

(A) 100 mm to 150 mm
(B) 100 mm to 200 mm
(C) 100 mm to 600 mm
(D) 102 mm to 762 mm
(E) Answer not known

142. Flow into horizontal galleries dug down to the impervious soil layer Q is form by

When H = Depth of GWT above impervious soil layer

h_1 = Depth of water table in the gallery

L = The phreatic surface is parabolic dropping from H to h_1 in a distribution

l = Gallery length

(A) $Q = \frac{Kl}{L}\left(H^2 - h_1^2\right)$ (B) $Q = \frac{KL}{l}\left(H^2 - h_1^2\right)$

(C) $Q = \frac{Kl}{L}\left(h_1^2 - H^2\right)$ (D) $Q = \frac{Kl}{L}\left(\frac{H^2}{h_1^2}\right)$

(E) Answer not known

143. Specific yield is known as the volume of water pumped out and the volume of sediments drained and is expressed in percentage as

(A) Specific yield = $\frac{\text{Volume of sediments drained}}{\text{Volume of water pumped out}} \times 100$

(B) Specific yield = $\frac{\text{Porosity}}{\text{Volume of water pumped out}} \times 100$

(C) Specific yield = (Specific retention / Volume of sediments drained) 100

(D) Specific yield = $\left[\frac{\text{Volume of water pumped out}}{\text{Volume of sediments drained}} \times 100\right]$

(E) Answer not known

144. Given the following are the statement having false statement also. Identify the false statement

(A) Presence of a recharge boundary in the aquifer tends to offset, the unsteady character of the flow

(B) Data on three observation wells are required when a well is pumped, to delineate the aquifer boundary

(C) Image wells transform a finite aquifer into an infinite aquifer so that the draw down at any point can be determined by applying thesis equation

(D) Thesis equation assumes that the entire pumpage is instantaneously released from storage inside the tube well

(E) Answer not known

145. The selection of well screen material depends on

(i) Water quality

(ii) Corrosion resistance

(iii) Cost

(iv) Strength of material

(A) (i), (ii) is correct and (iii), (iv) is wrong

(B) (i), (ii), (iii) is correct and (iv) is wrong

(C) (i), (ii), (iv) is correct and (iii) is wrong

(D) (i), (ii), (iii), (iv) is correct

(E) Answer not known

146. The well having cross-sectional area of flow is more

(A) Dug well
(B) Open well
(C) Drilled well
(D) All of the above
(E) Answer not known

147. The specific capacity of a well is

Q = well discharge

S = draw down

(A) S/Q
(B) Q/S
(C) $Q \times S$
(D) $(Q - S)/Q$
(E) Answer not known

148. The basic assumptions of the unit hydrograph theory are

(A) linear response and linear time variance
(B) time invariance and linear response
(C) non linear time invariance and linear response
(D) linear time variance and nonlinear response
(E) Answer not known

149. Hyetograph is a plot of

(A) the intensity of rainfall against the time interval

(B) the cumulative intensity of rainfall against the time interval

(C) the annual rainfall against the year

(D) the accumulated annual rainfall

(E) Answer not known

150. The Hydrologic equation is simply the statement of the law of conservation of matter and is calculated by the equation

Where I = Inflow

O = Outflow

ΔS = Change in storage

(A) $I = O + \Delta S$

(B) $I = O - \Delta S$

(C) $I = O/\Delta S$

(D) $I = \frac{\Delta S}{O}$

(E) Answer not known

151. Darcy's law is valid in a porous media flow of the Reynolds number is less than unity.

This Reynolds number is defined as

(A) (discharge velocity × maximum grain size)/μ

(B) (actual velocity × average grain size)/V

(C) (discharge velocity × average grain size)/V

(D) (discharge velocity × pore size)/V

(E) Answer not known

152. A hyetograph is a graphical representation of

(A) Discharge and time

(B) Rainfall intensity and time

(C) Rainfall depth and time

(D) Cumulative rainfall and time

(E) Answer not known

153. Rate of rainfall is expressed in _____

(A) mm (B) cm

(C) m (D) km

(E) Answer not known

154. The elevation of a point is its vertical distance above or below the Datum is known as

(A) Height of Collimation [H.I]

(B) Back Sight [B.S]

(C) Fore Sight [F.S]

(D) Reduced Level [R.L]

(E) Answer not known

155. Excavated material is loose and occupies _____ more volume than measured in situ.

(A) 10%

(B) 20%

(C) 25%

(D) 60%

(E) Answer not known

156. In a compass traversing when the needle points north, the reading under the prism should be

(A) Positive

(B) Negative

(C) Zero

(D) None of the above

(E) Answer not known

157. When is the GPS system fully operational?

(A) 1992

(B) 1994

(C) 1993

(D) 1991

(E) Answer not known

158. When is National Survey Day celebrated?

(A) 15th May
(B) 23rd June
(C) 10th April
(D) 20th June
(E) Answer not known

159. Who was the inventor of GPS?

(A) Roger M. Easton
(B) Roger L. Easton
(C) Roger D. Easton
(D) Roger N. Easton
(E) Answer not known

160. Simpson's rule for calculating area is applied when the number of offsets should

(A) Negative
(B) Positive
(C) Odd
(D) Even
(E) Answer not known

161. The _____ sensor works based on resistance change with temperature.

(A) LVDT
(B) RTD
(C) Piezoelectric sensor
(D) Capacitive sensor
(E) Answer not known

162. Bridman gauges are used for measurement of _____.

(A) Low Vacuum pressure
(B) Atmospheric pressures
(C) Moderate pressures
(D) Very high pressures
(E) Answer not known

163. Find the disadvantage of Thermocouple _____.

(A) Thermocouple are cheaper than the resistance thermometer
(B) Thermocouple follow the temperature change with a small time lag
(C) Thermocouple is suitable for recording rapid change in temperature
(D) Thermocouple have lower accuracy and cannot be used for precision work
(E) Answer not known

164. The blades in a torque converter have a shape which is _____.

(A) Square
(B) Round
(C) Flat
(D) Curved
(E) Answer not known

165. The tractor engine oil is checked _____ for maintenance.

(A) Every 10 hrs of operation
(B) Every 50 hrs of operation
(C) Every 200 hrs of operation
(D) Only when engine overheat
(E) Answer not known

166. The torque produced by DC Motor is proportional to _____.

(A) Field current
(B) Armature current
(C) Supply voltage
(D) Resistance of armature
(E) Answer not known

167. Sun gear using in the differential unit is a _____.

(A) Spur gear
(B) Helical gear
(C) Bevel gear
(D) Worm and worm wheel
(E) Answer not known

168. Piston crown is exposed to very high combustion temperature at _____.

(A) Centre of the crown
(B) Circumference of the crown
(C) Upper part of the skirt
(D) Lower part of the skirt
(E) Answer not known

169. Spark plug is designed to operate about

(A) 5,000 to 10,000 volts
(B) 11,000 to 25,000 volts
(C) 26,000 to 35,000 volts
(D) 36,000 to 45,000 volts
(E) Answer not known

170. The role of transfer port in two-stroke engine is _____.

(A) mix the air and fuel in the crank case
(B) mix the air and fuel in the combustion chamber
(C) allow the air and fuel from crank case to combustion chamber
(D) allow the air and fuel from combustion chamber to crank case
(E) Answer not known

171. Pumping losses in I.C. Engine increases

(A) with increase in volume
(B) with increase in temperature
(C) with increase in fuel consumption
(D) with increase in speed
(E) Answer not known

172. To operate high injection pressure _____ nozzle to be used.

(A) Single hole
(B) Multi-hole
(C) Pintle
(D) Pintaux
(E) Answer not known

173. The most accurate gasoline injection system is _____

(A) Direct injection
(B) Port injection
(C) Throttle body injection
(D) Manifold injection
(E) Answer not known

174. A solid cast iron disk, 1 m in diameter and 0.2 m thick, is used as a flywheel. It is rotating at 350 rpm. It is brought to rest in 1.5 second by mean of a brake. Find the mass of flywheel and the density of C.I is 7200 kg/m^2

(A) 1130.97 kg
(B) 1140.97 kg
(C) 1165.97 kg
(D) 1180.97 kg
(E) Answer not known

175. In a leaf spring suspension system, where are the Shackles typically located?

(A) Attached to the chassis
(B) Attached to the cross bar
(C) At the center of the tractors
(D) At the final drive
(E) Answer not known

176. In steering system, arc of movement of the drop arm is usually from _____.

(A) 30° to 60°
(B) 45° to 60°
(C) 60° to 75°
(D) 60° to 90°
(E) Answer not known

177. Rapid oscillation of steering wheel occurring at high speed is known as _____.

(A) steering play
(B) shimmy
(C) wheel wobbling
(D) zero caster
(E) Answer not known

178. A Hartnell governor is a _____.

(A) Pendulum type governor
(B) Spring loaded governor
(C) Dead weight governor
(D) Inertia governor
(E) Answer not known

179. The maximum value of axial force at the clutch which a driver can apply while driving without getting fatigued is approximately

(A) 10 N
(B) 100 N
(C) 500 N
(D) 5000 N
(E) Answer not known

180. _____ is the typical operating temperature range for most automotive engine.

(A) 50 – 70°C
(B) 80 – 100°C
(C) 110 – 130°C
(D) 130 – 150°C
(E) Answer not known

181. _____ food preservation method is based on the information that harmful food borne bacteria do not grow at 0 – 5°C or below.

(A) Sterilization
(B) Pasteurization
(C) Refrigeration
(D) Freezing
(E) Answer not known

182. Total heat means

(A) Addition of sensible and latent heat
(B) Division of sensible and latent heat
(C) Deviation of sensible and latent heat
(D) Subtraction of sensible and latent heat
(E) Answer not known

183. The pressure of homogenization process in 1st stage _____ psi and 2nd stage in _____ psi.

(A) 2500, 500
(B) 2000, 500
(C) 2500, 600
(D) 2000, 400
(E) Answer not known

184. The time temperature combination for HTST and LTLT process is _____.

(A) 70°C 20 sec and 65°C 25 minutes
(B) 72°C 15 sec and 63°C 30 minutes
(C) 72°C 10 sec and 63°C 20 minutes
(D) 75°C 15 sec and 65°C 30 minutes
(E) Answer not known

185. The major protein present in milk is _____.

(A) casein
(B) albumin
(C) gliadin
(D) avidin
(E) Answer not known

186. Which one of the following is not equivalent to the one ton of refrigeration?

(A) 210 kJ/min
(B) 3.5 kW
(C) 50 kcal/min
(D) 8 hp
(E) Answer not known

187. The migration of substances from packaging material to food depends on _____ factors.

(i) type of food
(ii) temperature of packaging
(iii) storage conditions of food
(iv) weight of the food

(A) (i), (ii) only
(B) (ii), (iv) only
(C) (i), (ii), (iii) only
(D) (iv) only
(E) Answer not known

188. Which of the statement is true about irradiation technology?

I. little or no heating of foods

II. packed and frozen food can be treated

III. major change in nutritional value of food

(A) I only
(B) I, II only
(C) II, III only
(D) III only
(E) Answer not known

189. UV irradiation in the food industry is used for the treatment of

(i) Water for beverages

(ii) Knives for slicing

(iii) Aging of meats

(iv) Milk

(A) (i) only
(B) (ii) and (iii) only
(C) (i), (ii), (iii) only
(D) (iv) only
(E) Answer not known

190. The dielectric properties of foods in microwave heating depends on _____.

I. Chemical composition of food

II. Moisture content of food

III. Temperature

IV. Bulk density

(A) I, II, III, IV only
(B) I, III, IV only
(C) I, II only
(D) III, IV only
(E) Answer not known

191. Match correctly the temperature of destruction of harmful bacteria in milk.

(a)	Holding method or Batch process	1.	135°C for 3 seconds
(b)	HTST	2.	62.8°C for 30 minutes
(c)	Ultra high temperature	3.	71.7°C for 15 seconds

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

(E) Answer not known

192. Case hardening in food products during drying process is caused by _____.

(A) rapid initial drying
(B) slow initial drying
(C) rapid final drying
(D) slow final drying
(E) Answer not known

193. Functions of evaporation process is/are _____.

(i) Mass and volume reduction
(ii) Preservation
(iii) To give desired consistency
(iv) Reduce pH

(A) (i), (ii) only
(B) (i), (ii), (iii) only
(C) (ii), (i), (iv) only
(D) (ii) and (iv) only
(E) Answer not known

194. Which of the statement is true about extrusion process?

I. extrusion cooking is a one-step process
II. retention time is short
III. it is a continuous process
IV. extruder is versatile

(A) I and II only
(B) II, III, IV only
(C) I, III, IV only
(D) I, II, III and IV
(E) Answer not known

195. Which of the following statements are true about cyclone separator?

(i) The heavier materials slide down along the walls of the cyclone and is discharged at the bottom.

(ii) A particle is acted upon by the centrifugal force and weight of the particle.

(iii) The whirling air collected at the centre and delivered out through top opening.

(A) (i) only
(B) (i) and (ii)
(C) (i), (ii) and (iii)
(D) (i) and (iii)
(E) Answer not known

196. Heat travels along with a moving fluid is known as _____ type of heat transfer.

(A) Conduction
(B) Convection
(C) Radiation
(D) Microwave
(E) Answer not known

197. In steady state, the "State" of the system means

(A) Temperature
(B) Pressure
(C) Chemical composition
(D) (A), (B) and (C)
(E) Answer not known

198. The concentration of total soluble solids in solutions indicated by _____ units.

(A) Brix

(B) Celsius

(C) Fahrenheit

(D) Kelvin

(E) Answer not known

199. Which of the following statement is true about centrifugal evaporator?

I. Suitable for heat sensitive products

II. Suitable for highly viscous products

III. Very cheap

(A) I only

(B) II only

(C) III only

(D) I and II

(E) Answer not known

200. Boiling temperature of a solution depends on

(i) Concentration of the solution

(ii) Pressure of the solution

(iii) Colour of the solution

(A) (i) only

(B) (i), (ii) only

(C) (iii) only

(D) (ii) only

(E) Answer not known
