Register
Number

2017
AGRICULTURAL ENGINEERING
(Degree Standard)

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

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

IMPORTANT INSTRUCTIONS

1. The applicant will be supplied with Question Booklet 15 minutes before commencement of the examination.

2. This Question Booklet contains 200 questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there and ensure there are no blank pages in the question booklet. **In case any defect in the Question Paper is noticed it shall be reported to the Invigilator within first 10 minutes and get it replaced with a complete Question Booklet. If any defect is noticed in the Question Booklet after the commencement of examination it will not be replaced.**

3. Answer all questions. All questions carry equal marks.

4. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.

5. An answer sheet will be supplied to you, separately by the Invigilator to mark the answers.

6. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, action will be taken as per commission's notification.

7. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.

8. In the Answer Sheet there are **four** circles Ⓐ, Ⓑ, Ⓒ and Ⓓ against each question. To answer the questions you are to mark with Ball point pen ONLY ONE circle of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. *e.g.* If for any item, Ⓑ is the correct answer, you have to mark as follows :

<p align="center">Ⓐ ● Ⓒ Ⓓ</p>

9. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.

10. The sheet before the last page of the Question Booklet can be used for Rough Work.

11. Do not tick-mark or mark the answers in the Question Booklet.

12. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.

▲

1. The Bench mark fixed at the end of a days work is called the

    (A) Arbitrary Bench Mark

    (B) Permanent Bench Mark

    (C) Temporary Bench Mark ✓

    (D) Universal Bench Mark

2. The staff reading taken on a point of known elevation is termed the

    (A) Foresight bearing (reading)

    (B) Backsight bearing (reading) ✓

    (C) Intermediate (reading)

    (D) ' Endsight (reading)

3. The working principle of the optical square is based on

    (A) Reflection   (B) Refraction

    (C) Transmission   (D) Double reflection ✓

4. The normal onset of monsoon in India is in

    (A) Early June at Bombay and Chennai

    (B) Early June at Kerala and Assam ✓

    (C) Early May in Kerala only

    (D) November in Tamilnadu and Kerala

5. A unit hydrograph has

    (A) One unit of peak discharge

    (B) One unit of rainfall duration

    (C) One unit of direct runoff ✓

    (D) One unit of the time base of direct runoff

6. Direct runoff is made up of

    (A) Surface runoff, prompt interflow and channel precipitation ✓

    (B) Surface runoff, infiltration and evapotranspiration

    (C) Overland flow and infiltration

    (D) Rainfall and evaporation

7. Match the following
   (a) Lysimeter   1. evaporation
   (b) Anemometer   2. wind direction
   (c) Wind vane   3. evapotranspiration
   (d) Pan evaporimeter   4. wind speed

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

   (B) ✓

8. The drilling component used in air rotary drilling is
   (A) Clear water
   (B) Water mixed with bentonite
   (C) Water mixed with other additives
   (D) ✓ Compressed air

9. The shape of catchment affects the runoff by changing the
   (A) ✓ time of concentration   (B) size
   (C) relief   (D) drainage density

10. The G-3 gullies are ——————— sized gullies.
    (A) very small   (B) small
    (C) ✓ medium   (D) very large

11. Splash erosion is associated to
    (A) ✓ rainfall intensity   (B) wind velocity
    (C) runoff   (D) slope steepness

12. The terminal velocity of raindrop depends on
    (A) ✓ particles diameter
    (B) particles shape
    (C) wind velocity
    (D) acceleration due to gravity

13. Match the following :

	Type of Bund		Use/Adaptability
(a)	Side bund	1.	Defines the boundary
(b)	Lateral bund	2.	End of contour bund
(c)	Supplemental bund	3.	Breaking the length of contour bund
(d)	Marginal bund	4.	Reduce Horizontal spacing between two contour bunds

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

14. The other name of Drop Inlet Spillway is

(A) Ogee Spillway   (B) Chute Spillway

(C) Overflow Spillway   (D) ✓ Shaft Spillway

15. 1 cusec is

(A) 1 cubic metre per second

(B) ✓ 1 cubic foot per second

(C) 1 cubic inch per second

(D) 1 cubic centimetre per second

16. Which of the following factor does not affect the wind erosion?

(A) ✓ land gradient

(B) moisture content of soil

(C) soil texture

(D) soil structure

17. The shelterbelts are established with the help of

(A) stones   (B) ✓ vegetative plantation

(C) masonry walls   (D) wire fencing

18. Darcy's law is valid as long as Reynolds number is less than
    (A) 0.01   (B) 0.1
    (C) ✓ 1.0   (D) 10.0

19. Which of the following statements are true?
    (i)   Bulk density increases with more soil compaction
    (ii) The difference between bulk density and apparent specific gravity is that the former is expressed in gram per cubic centimetres and latter is a dimension less quantity
    (iii) Particle density changes with tillage practices
    (A) (i) only   (B) ✓ (ii) only
    (C) (ii) and (iii) only   (D) (i), (ii) and (iii)

20. An area of 25 ha of crops will be irrigated by a pump working 10 hours a day. Irrigation is desired at 50% soil water depletion. The available water holding capacity of soil is 20 cm per metre depth of soil. The depth of root zone is 75 cm. Calculate the net irrigation requirement.
    (A) 15 cm   (B) 30 cm
    (C) ✓ 7.5 cm   (D) 3.75 cm

21. Relative proportion of sand, silt and clay determines the ——————— of the soil.
    (A) Organic matter   (B) Structure
    (C) ✓ Texture   (D) Moisture content

22. A metergate is a
    (A) ✓ modified submerged orifice
    (B) type of culvert
    (C) type of siphon mechanism
    (D) velocity measurement device

23. The jet of water after passing through an orifice contracts and reaches a minimum sectional area at a certain section called
    (A) ✓ Vena contract
    (B) Submerged section
    (C) Partially submerged section
    (D) Converging section

24.   Reciprocating pumps develop ——————— heads and ————————— capacity.

   (A)   high, low

   (B)   low, high

   (C)   high, high

   (D)   low, low

25.   The operation of levelling across any river is termed as

   (A)   Profile levelling

   (B)   Reciprocal levelling

   (C)   Compound levelling

   (D)   Simple levelling

26.   Match the following :

   (a)   cavitation   1.   Turbine pump

   (b)   Diffuser   2.   Jet pump

   (c)   Bowl assembly   3.   Centrifugal pump

   (d)   Ejector   4.   Collapse of water vapour pockets

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

27.   The mass curve of rainfall of a storm is a plot of

   (A)   rainfall depths for various equal durations plotted in decreasing order

   (B)   rainfall intensity vs time in chronological order

   (C)   accumulated rainfall intensity vs time

   (D)   accumulated precipitation vs time in chrological order

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28. The septic tank should be inspected atleast once in two years and cleaned before the sludge level reaches the —————— of the outlet.

(A) bottom level

(B) centre

(C) 3/4 of outlet opening

(D) top level

29. The recommended side slope of graded bunds in sandy soil is

(A) 0.5 : 1   (B) 1 : 1

(C) 1.5 : 1   (D) 2 : 1

30. The average farm stead water requirement for Buffalo in litres per capita per day is

(A) 100   (B) 200

(C) 300   (D) 400

31. When water is to be taken from a lateral channel into a field distribution channel, the structure used is

(A) culvert   (B) canvas dam

(C) diversion box   (D) turn out

32. In electric fencing, the wooden or concrete posts are placed about —————— in apart.

(A) 10   (B) 20

(C) 30   (D) 40

33. For milch animals the type of barn prefered is

(A) face-in type   (B) face-out type

(C) alley type   (D) open in type

34. Calving calf rearing and housing sick animals are done in structures called

    (A) community barn   (B) ✓ pen barn

    (C) milking parlour   (D) cow stall

35. The permissible value of mean velocity of flow in an earth channel in loamy soil is

    (A) 40 cm /s   (B) ✓ 60 cm /s

    (C) 80 cm /s   (D) 100 cm /s

36. The dimensions of a cage to house one bird in a poultry house is

    (A) $0.2 \times 0.2 \times 0.3$ m   (B) $0.2 \times 0.3 \times 0.4$ m

    (C) $0.3 \times 0.4 \times 0.5$ m   (D) ✓ $0.6 \times 0.2 \times 0.45$ m

37. To prevent damage of pipeline from the load acting on it, concrete pipes should be laid with upper surface at a depth of about

    (A) 30 cm   (B) ✓ 45 cm

    (C) 60 cm   (D) 75 cm

38. 'Direct' type renewable energy source is

    (A) ✓ Solar energy   (B) Wind energy

    (C) Hydro power   (D) Ocean energy

39. Sun's declination on December 22 is

    (A) $-11.75°$ (B) $+11.75°$

    (C) ✓ $-23.5°$ (D) $+23.5°$

40. n - type semiconductor is formed by doping ——————— in silicon semi conductor.

    (A) gallium   (B) indium

    (C) boron   (D) ✓ phosphorus

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41. Chief component of biogas is

(A) H_2S

(B) H_2

(C) CO_2

(D) ✓ CH_4

42. For maximum biogas production, the digester has to be buffered with the pH range of

(A) 4.0 – 6.5

(B) ✓ 6.5 – 7.5

(C) 7.5 – 9.0

(D) 9.0 – 10.0

43. Conversion of biomass into methane rich gas is done through

(A) gasification

(B) pyrolysis

(C) ✓ anaerobic digestion

(D) aerobic digestion

44. Destructive distillation of organic material heated to more than 200°C in the absence of air is called ——————— process.

(A) Combustion

(B) Gasification

(C) ✓ Pyrolysis

(D) Fermentation

45. Gasification efficiency is in the range of ——————— %.

(A) < 10

(B) 10 – 30

(C) 40 – 60

(D) ✓ 70 – 90

46. In ——————— biogas plant, gas storage portion is an integral part of digester.

(A) ✓ Janata

(B) KVIC

(C) Pragathi

(D) Ganesh

47. The SI unit for thermal diffusivity is

   (A) ✓ m^2 / s (B) m^2 / s^2

   (C) m^3 / s^2 (D) s^2 / m

48. Angle of repose of grain is estimated from the heap as:

   (A) ✓ $\phi = \tan^{-1}\left(\dfrac{\text{height of heap}}{\text{radius of heap}}\right)$

   (B) $\phi = \tan^{-1}\left(\dfrac{\text{height of heap}}{\text{diameter of heap}}\right)$

   (C) $\phi = \tan^{-1}\left(\dfrac{\text{radius of heap}}{\text{height of heap}}\right)$

   (D) $\phi = \tan^{-1}\left(\dfrac{2 \times \text{radius of heap}}{\text{height of heap}}\right)$

49. From the psychometric chart it is noted that the wet bulb, dry bulb and dew point temperatures are equal, when RH is

   (A) 0 percent   (B) 25 percent

   (C) 50 percent   (D) ✓ 100 percent

50. The relationship between equilibrium moisture content and relative humidity for biological materials is given by ———————— equation.

   (A) Perry   (B) Rankine

   (C) Janssen   (D) ✓ Henderson

51. The rate of respiration is predominantly dependent upon

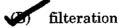   (A) ✓ Grain moisture content and temperature

   (B) Grain moisture content and specific gravity

   (C) Grain temperature and density

   (D) Grain temperature and specific gravity

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52. In CFTRI method of parboiling, paddy is steamed at a pressure of

(A) $5 \, kg/cm^2$

(B) $4 \, kg/cm^2$ ✓

(C) $4 \, kg/mm^2$

(D) $4.5 \, kg/mm^2$

53. Effectiveness of hulling is represented by

(A) ✓ $1 - \dfrac{amount \, of \, unhulled \, grain}{amount \, of \, grain \, before \, hulling}$

(B) $1 - \dfrac{amount \, of \, grain \, before \, hulling}{amount \, of \, unhulled \, grain}$

(C) $\dfrac{amount \, of \, grain \, before \, hulling}{amount \, of \, unhulled \, grain} - 1$

(D) $\dfrac{amount \, of \, unhulled \, grain}{amount \, of \, grain \, before \, hulling} - 1$

54. —————— is used to remove final part of bran layer and simultaneous cooling of rice through an air stream.

(A) Horizontal polisher

(B) Abrasive whitener

(C) Jet Pearler ✓

(D) Cone polisher

55. Identify the incorrect statement on the objective of steeping during corn wet milling.

(A) to harden the kernel for better grinding ✓

(B) to facilitate separation of germ

(C) for separation of gluten from the starch granules

(D) to remove solubles

56. In CFTRI method of pulse milling, pulses are conditioned in LSU dryer at a temperature of

(A) 90°C

(B) 100°C

(C) 110°C

(D) 120°C ✓

57. The heat exchanger, which is suitable for the transfer of heat between liquid to liquid, liquid to gas and gas to gas is

(A) shell and tube heat exchanger

(B) ✓ double pipe heat exchanger

(C) plate-fin type heat exchanger

(D) plate type heat exchanger

58. Rate of filtration is given by

(A) driving force × resistance

(B) ✓ driving force / resistance

(C) resistance / driving force

(D) driving force − resistance

59. —————— is the process of removal of insoluble solids from a suspension of by passing through a porous medium.

(A) sedimentation (B) ✓ filteration

(C) centrifugation (D) cyclone

60. Energy required to grind a material from one size to another is expressed by
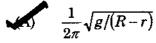
(A) Fick's Law (B) Newton's Law

(C) ✓ Kick's Law (D) Stoke's Law

61. In Jaw Crusher, the angle made between fixed jaw and moveable jaw is in the range of

(A) 10 – 20° (B) ✓ 21 – 30°

(C) 31 – 40° (D) 41 – 50°

62. Critical speed in ball mill for the radii R and r for the mill and balls, respectively is

(A) ✓ $\dfrac{1}{2\pi}\sqrt{g/(R-r)}$ (B) $2\pi\sqrt{g/(R-r)}$

(C) $\dfrac{1}{2\pi}\sqrt{\dfrac{(R-r)}{g}}$ (D) $2\pi\sqrt{\dfrac{(R-r)}{g}}$

63. The most common frequency used in domestic microwave oven is

(A) 2340 MHz (B) 2450 MHz ✓

(C) 2540 MHz (D) 2650 MHz

64. Homogenization reduces the mean diameter of fat globules by a factor of

(A) 10 ✓ (B) 100

(C) 1000 (D) 10000

65. Milk is a —————— of fat in water.

(A) Dispersion (B) Liquid

(C) Emulsion ✓ (D) Solution

66. One tonne of refrigeration is equivalent to

(A) 50 Kcal/min ✓ (B) 100 Kcal/min

(C) 150 Kcal/min (D) 200 Kcal/min

67. Calculate the heat required for cooling 1 tonne of apple from 25°C to 10°C, having specific heat of 0.8 kJ/Kgk.

(A) 8000 kJ (B) 10000 kJ

(C) 12000 kJ ✓ (D) 15000 kJ

68. Dehydrated fruits and vegetable products contain —————— of moisture.

(A) 1 to 5% ✓ (B) 1 to 2%

(C) 3 to 7% (D) 5 to 9%

69. The ratio of total length of drains to the catchment area is called

(A) Relief ratio

(B) Drainage frequency

(C) Drainage density ✓

(D) Bifurcation ratio

70. The reason for providing dead storage volume during the planning of reservoir is

    (A)   For the livelihood of aquatic animals

    (B)   For the sustenance of aquatic plants

    (C)   As an allowance for the storage of sediments

    (D)   To maintain the structural stability

71. Arrange the following phases of watershed management programme in chronological order starting from earliest.

    (i)   Restoration phase

    (ii)   Recognition phase

    (iii)   Improvement phase

    (iv)   Protection phase

    (A)   (i), (ii), (iii), (iv)   (B)   (ii), (i), (iii), (iv)

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

72. Relationships are established between to be treated and control watershed during the process of ———————— in watershed study.

    (A)   Calibration

    (B)   Project evaluation

    (C)   Experimentation

    (D)   Treatment

73. Main objectives of insitu conservation of rain water includes

    (i)   Safe diversion of surface runoff to storage structures through grassed waterways.

    (ii)   Stabilization of gullies and construction of check dams for increasing ground water recharge.

    (iii)   Water harvesting for supplemental irrigation.

    (A)   (i) and (ii) only

    (B)   (ii) and (iii) only

    (C)   (i) and (iii) only

    (D)   (i), (ii) and (iii)

74. Percolation tanks are generally constructed on the small streams for impounding surface run off to

(A) recharge ground water ✓

(B) pump and irrigate the land

(C) estimate soil erosion

(D) cultivate fish

75. Watershed erosion control includes all measures which are effective in preventing or delaying the movement of soil from their point of origin to the

(A) outlet   (B) gulley

(C) reservoir ✓   (D) rills

76. For interpretation of aerial photographs, the aerial photographs are placed under ———————— instrument.

(A) stereoscopes ✓   (B) microscopes

(C) total station   (D) telescope

77. Which of the following information cannot be interpreted from aerial photographs?

(A) Topography

(B) Landforms

(C) Water quantity ✓

(D) Farming and cultural measures

78. Which of the following information is/are available from an aerial photograph?

(i) Landforms

(ii) Type of vegetation

(iii) Farming practised on the surface

(A) (ii) only   (B) (i) and (iii) only

(C) (ii) and (iii) only   (D) (i), (ii) and (iii) ✓

79. If a sprayer required to discharge liquid at 20 litres/min at 20 kg/cm² pressure, the water power is equal to ——————— kW.

    (A) ✓   0.65   (B)   0.067

    (C)   6.5   (D)   1.30

80. In self propelled automatic riding type paddy transplanters of Japanese models the row to row spacing adopted is

    (A)   15 cm   (B)   20 cm

    (C) ✓   30 cm   (D)   40 cm

81. The stubble type mould board is a short but broader with a relatively ——————— curvature comparing with other mould boards.

    (A)   gentle   (B)   long

    (C) ✓   abrupt   (D)   smooth

82. The spool or spacer used in disc harrow is generally made of

    (A)   mild steel   (B) ✓   cast iron

    (C)   steel   (D)   alloy steel

83. Limb shakers for fruit harvesting are provided with

    (A) ✓   Slider crank mechanism

    (B)   Whitworth mechanism

    (C)   Quick return mechanism

    (D)   Roller chain mechanism

84. The links present in track chain of a crawler tractor is made of

    (A) ✓   drop forged steel   (B)   mild steel

    (C)   cast iron   (D)   alloy steel

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85. Type of cultivator recommended for soils which are embedded with stones or stumps is called as

(A) ✓ Spring type cultivator

(B) Rigid type cultivator

(C) Duck foot cultivator

(D) Bent leg cultivator

86. Determine the draft required to pull a four bottom 30 cm plough, working at a depth of 15 cm. The soil resistance is 0.7 kg/cm².

(A) ✓ 1260 kg   (B) 1200 kg

(C) 1250 kg   (D) 1230 kg

87. A plough used for breaking hard layers of soil just below the regular ploughing depth is called as

(A) Disc plough   (B) Cultivator

(C) ✓ Chisel plough   (D) Disc harrow

88. Horizontal component of the pull, parallel to the line of motion is called as

(A) Side draft   (B) ✓ Draft

(C) Back draft   (D) Unit draft

89. Clay soils contain more than —————— % of clay particles.

(A) 30%

(B) ✓ 40%

(C) 50%

(D) 55%

90. The connecting rod is usually made of

(A) ✓ drop forged steel

(B) cast iron

(C) case hardened alloy steel

(D) chromium nickel alloy

91. During field work the rear tyre pressure of tractor is maintained with-in ——————— kg/cm².
    - (A) 1.8 to 2.2
    - (B) 0.8 to 1.2 ✓
    - (C) 2.5 to 2.8
    - (D) 1.5 to 2.3

92. Angle between the centre line of the tyre and the vertical line is called as
    - (A) caster angle
    - (B) camber angle ✓
    - (C) tilt angle
    - (D) tyre angle

93. External contracting shoe type brake system is available on
    - (A) Crawler tractor ✓
    - (B) 2 wheel drive tractor
    - (C) 4 wheel drive tractor
    - (D) Walking tractor

94. Stroke bore ratio for tractor engines is
    - (A) 1.25 ✓
    - (B) 1.50
    - (C) 1.45
    - (D) 1.40

95. The specific gravity of electrolyte present in a battery is measured by
    - (A) Anemometer
    - (B) Hygrometer
    - (C) Hydrometer ✓
    - (D) Manometer

96. If the implement is connected to the tractor hydraulic through three points linkage, it is known as,
    - (A) Mounted implement ✓
    - (B) Semi mounted implement
    - (C) Trailed implement
    - (D) PTO operated implement

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97. The main principle of surveying is to work from
    (A) the centre to boundary
    (B) the boundary to centre
    (C) the whole to the part ✓
    (D) the part to the whole

98. Which type of cross-staff is commonly used?
    (A) Adjustable cross-staff
    (B) Open cross-staff ✓
    (C) French cross-staff
    (D) Optical square

99. The sum of interior angles of a closed travers is ——————, where 'n' is the number of sides.
    (A) $(2n - 4) \times 90°$ ✓
    (B) $(2n + 4) \times 90°$
    (C) $(n - 4) \times 90°$
    (D) $(n + 4) \times 90°$

100. In trapezoidal formula, the line joining the top of the ordinates is considered to be
    (A) curved
    (B) straight ✓
    (C) circular
    (D) parabolic

101. The operation of levelling from any BM to the starting point of any project is known as
    (A) longitudinal levelling
    (B) simple levelling
    (C) fly levelling ✓
    (D) continuous levelling

102. A contour line intersects a ridge line or valley line
    (A) obliquely
    (B) perpendicularly ✓
    (C) vertically
    (D) parallelly

103. The operation of levelling to determine the elevation between two points which are located far away is known as
    (A) simple levelling
    (B) fly levelling
    (C) differential levelling ✓
    (D) check levelling

104. Which of the following pairs of terms used in groundwater hydrology are not identical?

    (A)   Permeability and hydraulic conductivity

    (B)   Storage coefficient and storativity

    ✓(C) Actual velocity of flow and discharge velocity

    (D)   Water table aquifer and unconfined aquifer

105. A steady groundwater flow condition exists when

    ✓(A) The water levels in the wells cease to decline

    (B)   The water levels respond to changes in atmospheric pressure or tides

    (C)   The water levels drop as the pumping is continued

    (D)   The Laplace's equation is satisfied

106. The discharge per unit drawdown at a well is known as

    (A)   Specific yield   (B)   Specific storage

    (C)   Safe yield   ✓(D) Specific capacity

107. The water year in India starts from the first day of

    (A)   January   (B)   April

    ✓(C) June   (D)   September

108. A storm hydrograph was due to 3h of effective rainfall. It contained 6 cm of direct runoff. The ordinates of DRH of this storm

    (A)   When divided by 3 give the ordinates of a 6-h unit hydrograph

    ✓(B) When divided by 6 give the ordinates of a 3-h unit hydrograph

    (C)   When divided by 3 give the ordinates of a 3-h unit hydrograph

    (D)   When divided by 6 give the ordinates of a 6-h unit hydrograph

109. The gully development is accomplished under

(A) 2 stages
(B) 3 stages
(C) 4 stages ✓
(D) 5 stages

110. If cropping is done with the crop strip of uniform width is laid in the field at right angles to the direction of prevailing wind, it is called as

(A) Contour strip cropping
(B) Buffer strip cropping
(C) Field strip cropping
(D) Wind strip cropping ✓

111. A 20% ground cover with mulch can reduce the soil erosion upto

(A) 10%
(B) 20%
(C) 25%
(D) 40% ✓

112. Which of the following comes under agronomical measure?

(A) tillage practice ✓
(B) gabions and spurs
(C) terraces
(D) trenching

113. Which of the following is not the objective of contour cultivation?

(A) to reduce sheet and rill erosion
(B) to stabilize the sand dunes ✓
(C) to reduce sediment transport
(D) to enhance infiltration rate

114. Bench Terraces are usually constructed in land slopes of

(A) 2 – 6%
(B) 6 – 10%
(C) 6 – 16%
(D) 16 – 33% ✓

115. In design of bunds, the adjustment for infiltration and permeability is incorporated in

(A) bund width
(B) bund size
(C) bund spacing ✓
(D) bund height

116. Compartmental Bunding is constructed in land slopes of

(A) less than 1% ✓

(B) less than 6%

(C) 2 – 6%

(D) less than 10%

117. Soil loss is proportional to ——————, where 'L' is the length of slope.

(A) L

(B) L^2

(C) $L^{0.5}$ ✓

(D) $L^{0.33}$

118. Which of the following is related correctly?

(A) Sediment Yield = Gross Soil Erosion + Delivery Ratio

(B) Sediment Yield = Gross Soil Erosion – Delivery Ratio

(C) Sediment Yield = Gross Soil Erosion / Delivery Ratio

(D) Sediment Yield = Gross Soil Erosion × Delivery Ratio ✓

119. Erosivity is directly associated to the

(A) soil physical characteristics

(B) soil depth

(C) rainfall ✓

(D) crop properties

120. According to USDA classification, particle size of soil particles less than 0.002 mm are classified as

(A) fine sand

(B) very fine sand

(C) silt

(D) clay ✓

121. Hygroscopic water represents water held by soil in between —————— and ——————— atmospheric tension.

(A) 10,000 and 31 ✓

(B) 1/3 and 31

(C) 1/10 and 1/3

(D) 1/3 and 15

122. Particle density of dominant soil materials such as quartz is nearly

(A) 0.9 to 1.0

(B) 1.3 to 1.5 ✓

(C) 1.7 to 1.9

(D) 1.9 to 2.3

123. Intermittent application of water to field surface under gravity flow which results in a series of 'ON' and 'OFF' cycles of constant or variable time spans is called

(A) Drip Irrigation
(B) Cable Irrigation
(C) ✓ Surge Irrigation
(D) Subsurface Irrigation

124. The type of furrows that can be used on farely steeper lands are

(A) ✓ contour furrows
(B) steeper furrows
(C) longer furrows
(D) narrow furrows

125. If the laterals are placed uphill, the pressure available at the sprinkler head will be

(A) zero
(B) ✓ less
(C) more
(D) maximum

126. The algal grown in irrigation pipes can be minimized or controlled by treating the pipes with

(A) gypsum
(B) urea
(C) diammonium phosphate
(D) ✓ chlorine

127. Match the following :

(a) Solenoid valve   1. Hydro-cyclone
(b) Flush valve   2. Disc filter
(c) Filtration of organic matter 3. End of sub main
(d) Primary filtration of sand   4. Automation in drip irrigation

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

128. Depth of irrigation is ———————— related to the frequency of irrigation.

(A) not
(B) directly
(C) ✓ inversely
(D) not closely

129. Electrical conductivity of a soil solution is a measure of

   (A)   soil dryness

   (B)   soil iron content

   ✓(C) soil salainity

   (D)   clay content of the soil

130. In large farms where the farm labourers also live near the farmstead, the farmstead should be located near the

   (A)   Entrance of the farm

   (B)   South west corner of the farm

   ✓(C) Centre of the farm

   (D)   North west corner of the farm

131. In a farm house, the capacity of septic tank for an average family of five members, the septic tank capacity must be kept as

   (A)   1.5 cu.m   (B)   1.8 cu.m

   (C)   2.5 cu.m   ✓(D)   2.8 cu.m

132. In improved farm house design, a single storey building will have its ceiling at a height of about

   (A)   2.3 m   ✓(B)   3.3 m

   (C)   4.3 m   (D)   5.3 m

133. The structure which allows the discharge of water through a pipeline leaving the bund or dam undisturbed is called

   (A)   Masonry drop spillway   ✓(B)   Pipe drop spillway

   (C)   Open spillway   (D)   Chute spillway

134. For a septic tank size of 2.8 cu.m, a soak pit with total surface area of about ————— sq.m is needed.

   (A)   5   (B)   10

   ✓(C) 15   (D)   20

135. Concrete possesses

    I.   High compressive strength

    II.   Free from corrosion and weathering

    III.   Hard surface to raised abrasin

    (A)   I only   (B)   II only

    (C)   I and II   ✓(D)   I, II and III

136. For small size (breeds), birds, the average floor space required per hen for a herd of 100 No. of hens is

    (A)   0.25 sq.m   (B)   0.28 sq.m

    ✓(C)   0.32 sq.m   (D)   0.37 sq.m

137. In the stanchion barn

    I.   The cows are housed and milked in same building

    II.   The cows are housed and milked in milking parlour

    ✓(A)   I alone is true

    (B)   II alone is true

    (C)   I and II are true

    (D)   Both I and II are false

138. The poultry houses used in warm regions where birds need no protection from cold winds are named as

    ✓(A)   cage houses

    (B)   brooder houses

    (C)   wire floored poultry houses

    (D)   deep litter poultry houses

139. The face-in type barn gives a saving of ————————— percent in floor area of the barn as compared to the face – out type barn.

    (A)   10   ✓(B)   20

    (C)   30   (D)   40

140. Individual solar cells will produce power at about ——————————— and the current is proportional to cell's area.

   (A)   0.05 kV   (B)   0.5 kV

   (C)   0.05 V   (D) ✓ 0.5 V

141. Power available in the wind is greatly influenced by

   (A) ✓ wind velocity   (B)   swept area

   (C)   rotor diameter   (D)   air density

142. The fraction of the free flow wind power that can be extracted by a rotor is called as

   (A) ✓ Power coefficient

   (B)   Tip speed ratio

   (C)   Power density

   (D)   Maximum axial thrust

143. The maximum, theoretical power coefficient of a wind turbine is

   (A)   0.295   (B)   4/9

   (C) ✓ 16/27   (D)   59.8

144. The wind turbine is allowed to start rotating at ——————————— wind speed.

   (A) ✓ cut-in   (B)   cut-out

   (C)   furling   (D)   rated

145. Sequence of zones formed in a down draft gasifier from top to bottom is

   (A)   drying, pyrolysis, reduction and oxidation

   (B) ✓ drying, pyrolysis, oxidation and reduction

   (C)   drying, reduction, pyrolysis and oxidation

   (D)   drying, oxidation, reduction and pyrolysis

▲   27   AEAGE/17
                                                          [Turn over

146. In double stage anaerobic digestion ——————— are physically separated.

   (A) Inlet and outlet

   (B) Digester and gas holder

   ✓(C) Acidogenic and methanogenic stages

   (D) Slurry and biogas

147. Gasohol is ——————— mixture.

   (A) 90% biogas and 10% ethanol

   (B) 90% producer gas and 10% ethanol

   (C) 90% LPG and 10% ethanol

   ✓(D) 90% petrol and 10% ethanol

148. Which of the following statement is correct?

   (A) Direct use of vegetable oil is engine will not produce fumes or deposits

   ✓(B) Reaction of vegetable oils with alcohol produces esters

   (C) Glycerol will be mixed with oil for ester production

   (D) Methanol cannot be used for ester production

149. Which of the following is defined as cogeneration?

   (A) Generation of product and by product

   ✓(B) Simultaneous generation of power and heat in a single installation

   (C) Efficiency increase through process modernization

   (D) Reduction in energy consumption in an industry

150. In the project cycle for CDM, PDD stands for

   (A) preparation of design document

   (B) project documentation and designing

   ✓(C) project design document

   (D) project preparation, documentation and designing

151. Match the following

    (a)   Screen cleaners   1.   Specific gravity

    (b)   Disc separator   2.   Roundness

    (c)   Spiral separator   3.   Size

    (d)   Destoner   4.   Length

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

152. In thin layer drying of food grains, the grain bed thickness is limited to

(A)   10 cm   (B) ✓   20 cm

(C)   30 cm   (D)   40 cm

153. For gully control the gabions can be constructed as

(A)   spur   (B) ✓   drop structure

(C)   wall surface   (D)   cut off wall

154. Seeds with moisture content above ——————— percent is likely to get damaged during processing.

(A)   5   (B)   10

(C) ✓   15   (D)   20

155. Parboiling of paddy is

(A)   hydration

(B)   soaking and drying

(C)   thermal treatment

(D) ✓   hydrothermal treatment

156. A screw conveyor when inclined to 25°, will carry about ——————— of the rated horizontal capacity.

(A) 15%   (B) 25%

✓(C) 50%   (D) 75%

157. For conveying of grains in a belt conveyor, the recommended speed of belt is

(A) 2.0 to 2.5 m/s ✓(B) 2.5 to 2.8 m/s

(C) 3 to 4.5 m/s (D) 3.5 to 4.0 m/s

158. Spice beetle is known as

(A) *Sitophilus oryzae*

✓(B) *Stegodium paniceum*

(C) *Trogoderma granarium*

(D) *Lasioderma serricorne*

159. For storing 250 tonnes of bagged paddy grain, the stack distance is maintained as

(A) 1.0 m   (B) 1.5 m

✓(C) 2.0 m   (D) 2.5 m

160. Sucrose based solution or silver thiosulfate is used during ——————— operation in flower processing.

(A) Bunching   ✓(B) Pulsing

(C) Bud opening   (D) Tinting

161. Radiation refers to the transport of energy through space by ——————— waves.

(A) light   (B) magnetic

✓(C) electromagnetic   (D) spectrum

162. The rise in boiling temperature of a liquid ——————— the viscosity of the solution.

(A) decreases   ✓(B) increases

(C) does not change   (D) equals with

163. Mixing index ——————— with time.

(A) Decreases   (B) Increases ✓

(C) Equals   (D) Does not change

164. Ball formula method is used to calculate process time for ——————— process.

(A) sterilization ✓   (B) drying

(C) evaporation   (D) distillation

165. ——————— coating is normally given for the tin cans.

(A) Aluminium   (B) Copper

(C) Lacquer ✓   (D) Brass

166. For dehydration of heat sensitive liquid or slurry materials, the drum dryer is enclosed in a

(A) Pressure chamber

(B) Vacuum chamber ✓

(C) Freezing chamber

(D) Sublimation chamber

167. The screw speed in an extruder affects the

(A) Residence time of the product ✓

(B) Quality of the product

(C) Moisture content of the product

(D) Size of the product

168. The minimum recommended radiation dose for the safe treatment of food is

(A) 48 KGY   (B) 3 KGY

(C) 24 KGY   (D) 10 KGY ✓

169. Kirpich's formula is used to computer

    (A) ✓ Time of concentration

    (B) Evapotranspiration

    (C) Rate of flow

    (D) Hydraulic head

170. Size of a micro watershed is

    (A) $< 1 \text{ km}^2$ (B) $1 - 2 \text{ km}^2$

    (C) ✓ $1 - 10 \text{ km}^2$ (D) $10 - 100 \text{ km}^2$

171. Which of the following statements is/are TRUE with regard to watershed concept?
    (i) All watersheds can be divided into smaller sub watersheds.
    (ii) Each watershed is an independent hydrological unit.
    (iii) A watershed has a single outlet.

    (A) (iii) only

    (B) (ii) and (iii) only

    (C) (i) and (iii) only

    (D) ✓ (i), (ii) and (iii)

172. Watershed management essentially consists of
    (i) Basic land treatment to conserve soil moisture, control land erosion and harvest runoff
    (ii) Application of crop and animal management practices
    (iii) Alternate land use such as agroforestry social or silvi-pastoral system

    (A) (i) and (ii) only

    (B) (ii) and (iii) only

    (C) (i) and (iii) only

    (D) ✓ (i), (ii) and (iii)

173. In dry farming areas, —————————— approach provides an ideal means for integrated development.

    (A) ✓ Watershed   (B) Irrigation

    (C) Drainage   (D) Evaporation

174. Recharge capacity of well is given by

    (A)   hydraulic conductivity × available pressure head

    (B)   available capacity × available pressure head

    (C) ✓   specific capacity × available pressure head

    (D)   discharge × available pressure head

175. Recharge wells are sometimes called as diffusion wells. The reason for being called so, is because

    (A)   it disposes excess surface water

    (B)   it injects surface water

    (C) ✓   it is not extended below water table

    (D)   the movement of water is in reverse direction

176. Match the following :

	Artificial ground water recharging method		Suitability
(a)	Flooding method	1.	Flat areas
(b)	Spreading method	2.	Hard rock tracks
(c)	Ditch or furrow method	3.	Unconfined aquifer
(d)	Basin method	4.	Irregular terrains

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

177. Land capability classification is predominantly based on

    (A)   land use   (B)   land fertility

    (C) ✓   land slope   (D)   land cover

178. Which of the following are components of GIS?

    (i)   Data

    (ii)   Hardware

    (iii)   User

    (iv)   Software

    (A)   (i), (iii) and (iv) only

    (B)   (i), (ii) and (iv) only

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

    ✓(D)   (i), (ii), (iii) and (iv)

179. In ——————— depreciation method the depreciation amount is different for each year of the machines life.

    (A)   straight line

    ✓(B)   declining balance

    (C)   vector

    (D)   steady declining

180. In potato planters the type of seed metering mechanism used in

    (A)   cell feed mechanism

    (B)   star wheel mechanism

    (C)   brush feed mechanism

    ✓(D)   picker wheel mechanism

181. The largest crop area covered by drip irrigation in India is under

    (A)   plantation crops

    ✓(B)   orchard crops

    (C)   vegetable crops

    (D)   fiber crops

182. The number of droplets per unit area of leaf surface is called

    (A)   Droplet number

    ✓(B)   Droplet density

    (C)   NMD

    (D)   Droplet uniformity

183. The power requirement of self propelled type combine is

    (A)   12 hp per metre width of cut

    (B)   10 hp per metre width of cut

    (C)   8 hp per metre width of cut

    (D)   15 hp per metre width of cut

184. Soil strength is measured by

    (A)   Cone penetrometer

    (B)   Dynamometer

    (C)   Ammeter

    (D)   Wattmeter

185. A mower with high speed swinging knives, operating either in a horizontal plane or around a horizontal cylinder is called as

    (A)   Reciprocating mower

    (B)   Gang mower

    (C)   Flail mower

    (D)   Cylinder mower

186. Part of the cone nozzle which imparts rotation to the liquid passing through it is called as

    (A)   Swirl plate   (B)   Nozzle body

    (C)   Nozzle cap   (D)   Nozzle disc

187. Seed metering mechanism common in British seed drills is

    (A)   Cup feed mechanism

    (B)   Cell feed mechanism

    (C)   Brush feed mechanism

    (D)   Auger feed mechanism

188. A pump in which the piston travel is parallel to the axis of the pump is called as

(A) axial piston pump ✓

(B) co-axial piston pump

(C) tangential pump

(D) parallel pump

189. Toe – in varies in the range of

(A) 4 ± 2 mm ✓

(B) 5 ± 2 mm

(C) 4 ± 3 mm

(D) 5 ± 3 mm

190. Tendency of oil to resist flow is referred as

(A) viscosity ✓

(B) surface tension

(C) bulk density

(D) true density

191. Machines used for reboring cylinders are known as

(A) Boring bars ✓

(B) Drilling bars

(C) Reeming bars

(D) Tabbing bars

192. The power that is actually developed in the cylinder is called

(A) Brake horse power

(B) Indicated horse power ✓

(C) Frictional horse power

(D) Drawbar horse power

193. The distance walked by a ploughman on foot while ploughing one hectare of land once by bullocks having 15 cm furrow width.

(A) 33 km

(B) 66 km ✓

(C) 64 km

(D) 45 km

194. In engines, variation in speed on account of the variation of load is controlled by

(A) Carburetor
(B) Accelerator
(C) Governor ✓
(D) Clutch

195. The test carried out to ascertain the input utilization of the tractor for 'draft work' over a standard test tract is called as

(A) traction test
(B) drawbar test ✓
(C) power test
(D) all the above

196. In tractor diesel engine, air is compressed in the cylinder by the piston and fuel is injected into the cylinder approximately ——————° before Top Dead Centre (TDC).

(A) 5°
(B) 15° ✓
(C) 25°
(D) 30°

197. The process of removal of burnt or exhaust gases from the engine cylinder is known as

(A) exhaust
(B) smoke
(C) cleaning
(D) scavenging ✓

198. In forced circulation method of water cooling the water pump used is —————— type.

(A) Gear
(B) Centrifugal ✓
(C) Piston
(D) Vane

199. Final drive is a gear reduction unit in the power trains between the differential and the

(A) gear box
(B) hydraulic
(C) drive wheels ✓
(D) clutch

200. While ballasting using liquid in the inner tube —————— % of liquid filling is recommended.

(A) 25
(B) 50
(C) 75 ✓
(D) 40