Sl. No. :

CEAGE/18

Register Number

2018

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 in series 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 Room Invigilator to mark the answers.
6. You will also encode your Question Booklet Number 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 Blue or Black ink 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 :

   Ⓐ ● Ⓒ Ⓓ

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 time of 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. Applicants have to write and shade the total number of answer fields left blank on the boxes provided at side 2 of OMR Answer Sheet. An extra time of 5 minutes will be given to specify the number of answer fields left blank.
13. 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.

SEAL

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SPACE FOR ROUGH WORK

1. In plane tabling inaccessible points may be located by the

(A) Intersection method (B) Resection method

(C) Radiation method (D) Traversing method

2. In a planimeter, when the tracing point is moved along a circle without rotation of the wheel, then the circle is known as the

(A) Prime circle (B) Zero circle

(C) Ortho circle (D) Circum circle

3. The line joining points of equal elevation is known as a

(A) Horizontal line (B) Vertical line

(C) Contour line (D) Level line

4. The operation of levelling from the finishing point to the starting point at the end of a day's work is known as

(A) Simple levelling (B) Longitudinal levelling

(C) Cross-sectional levelling (D) Check levelling

5. The line of collimation and axis of the telescope should

(A) coincide (B) be parallel

(C) be perpendicular (D) be tangential

6. The benchmark established by the survey of India is known as the

(A) Temporary bench mark (B) Permanent bench mark

(C) GTS bench mark (D) Arbitrary bench mark

7. In the trapezoidal formula, for calculating area, the line joining the top of the ordinates is assumed to be

(A) curved (B) straight

(C) circular (D) parabolic

8. What do you infer from the following statements?

(i) There exists a positive correlation between organic matter present in soil and its water holding capacity

(ii) Channels left by decayed roots perform an important role in percolation of water

(A) (i) only true
(B) (ii) only true
(C) both (i) and (ii) are true
(D) both (i) and (ii) are not true

9. The gully in which erosion is continued is called

(A) Dormant gully
(B) Active gully
(C) Dead gully
(D) Healed gully

10. Match the following :

State of Gully	Property
(a) Stage 1	1. Healing
(b) Stage 2	2. Stabilization
(c) Stage 3	3. Formation
(d) Stage 4	4. Initiation

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

11. Contouring refers to growing of crops or performing of tillage operations

(A) across the contour of the area
(B) along the slope
(C) along the wind direction
(D) across the wind direction

12. Which of the following operation is associated to vertical mulching?

(A) mole drainage
(B) deep chiseling
(C) basin listing
(D) tie ridging

13. Central Arid Zone Research Institute is located in

(A) Jaipur
(B) Jaisalmer
(C) Jodhpur
(D) Agra

14. The channels constructed across the slope for the purpose of intercepting surface runoff are called as

(A) Diversion drains
(B) Relief drains
(C) Grassed waterway
(D) Field drains

15. On a 3 percent land slope, calculate the horizontal spacing of bunds in medium rainfall zone

(A) 90 m
(B) 60 m
(C) 30 m
(D) 15 m

16. Which of the following combinations is/are correct?

(i) Bench terrace with inward slope – Heavy rainfall areas
(ii) Bench terrace with level top – Medium rainfall areas
(iii) Bench terrace with outward slope – Low rainfall areas

(A) (i) only
(B) (ii) only
(C) (iii) only
(D) (i), (ii) and (iii)

17. The susceptibility or vulnerability of soil to erosion is termed as

(A) Erosivity
(B) Erodibility
(C) EI_{30} index
(D) Accretion

18. In EI_{30} method, the I_{30} refers to

(A) maximum rainfall intensity of 30 minutes duration
(B) rainfall depth of 30 mm
(C) kinetic energy of 30 minutes rainfall
(D) maximum infiltration rate for 30 minutes

19. Coshocton wheel is a

(A) sediment sampler
(B) flow measuring device
(C) velocity measuring device
(D) wind speed measuring device

20. Which of the following pairs are correctly matched?

(i) Soil wetness – Relative water content of soil

(ii) Mass wetness – Soil water content

(iii) Volume wetness – Soil water content on volumetric basis

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

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

21. 1 ha –m equals ———————— cubic meter.

(A) 1,000 (B) 10,000

(C) 5,000 (D) 50,000

22. In general, the major components of water requirement of crops is

(A) Pre-sowing irrigation

(B) Evapotranspiration

(C) Leaching requirement

(D) Deep precolation from crop root zone

23. Which of the following is/are used to measure irrigation water?

(i) Water meter

(ii) Current meter

(iii) Dethridge meter

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

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

24. Each side of cipoletti weir has a slope (H : V) of

(A) 1 : 2 (B) 1 : 3

(C) 1 : 4 (D) 1 : 5

25. The sheet of water which overflows a weir is called

(A) jet (B) runoff

(C) nappe (D) stream

26. In chlorine treatment of irrigation water, the quantity of bleaching powder added in the water source is

(A) 0.5 mg/lit (B) 1.0 mg/lit

(C) 2.0 mg/lit (D) 3.0 mg/lit

27. Find out the depth of which 1 ha of rice field can be irrigated with a flow of 7.5 l/s in 8 hours.

(A) 0.0216 cm (B) 21.6 cm

(C) 2.16 cm (D) 4.32 cm

28. Efficiency of Airlift pumps is about ———— per cent.

(A) 30 (B) 50

(C) 70 (D) 80

29. Drainage coefficient is the depth of water drained off from a given area in

(A) 1 hour (B) 1 day

(C) 1 minute (D) 1 month

30. Match the following :

	Property		Unit
(a)	EC	1.	$(mmole/l)^{1/2}$
(b)	SAR	2.	ds/m
(c)	RSC	3.	per cent
(d)	ESP	4.	mc/l

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

31. The soak pit should be filled with

(A) course aggregates only

(B) fine aggregates only

(C) course and fine aggregates only

(D) heavy clay

32. The minimum side slope of an earthen channel for polyethylene lining is

(A) 2 : 1

(B) 2.5 : 1

(C) 3 : 1

(D) 15 : 1

33. Determine the capacity of an overhead water tank (in litres) for a farm stead demanding a maximum of about 40000 litres of water per hour for two hours during noon and only about 25000 litres per hour during rest of the period. The tube well is capable of supplying at the rate of only 28000 lit/hr

(A) 12,000

(B) 24,000

(C) 25,000

(D) 36,000

34. The most commonly used concrete pipes for underground pipeline water distribution system is

(A) pipes with bell ends

(B) pipes with tongue and groove joint

(C) pipes with faucet and spigot joint

(D) pipes with collar joints

35. Which of the following is called super structure?

I. Foundation

II. Walls and pillars

III. Roofs, floors and doors and windows

(A) I only

(B) II and III

(C) I and II

(D) I, II and III

36. Which type of poultry house is most economical?

(A) wire floored poultry houses

(B) deep litter poultry houses

(C) cage houses

(D) open air poultry houses

37. Face-in type of barn are usually preferred for

(A) Milch animals

(B) Bullocks

(C) Buffaloes

(D) Sick animals

38. The limiting operating pressure which can be sustained by a non-reinforced concrete pipe in irrigation water conveyance is

(A) 4 m

(B) 6 m

(C) 8 m

(D) 10 m

39. Pyrheliometer is an instrument, which measures

(A) Beam radiation

(B) Total radiation

(C) Global radiation

(D) Diffused radiation

40. Functions of cover plates in flat plate collectors are

(i) to transmit maximum short wave radiation to the absorber plate

(ii) to minimise upward heat loss from the absorber plate

(iii) to shield the absorber plate from direct expose to environment

(iv) to allow infra red radiation emitted by the absorber plate

(A) (i), (ii) and (iii) are correct

(B) (i), (iii) and (iv) are correct

(C) (i), (ii) and (iv) are correct

(D) (ii), (iii) and (iv) are correct

41. Glass wool is used as ———— in a flat plate collector.

(A) absorber plate

(B) cover plate

(C) insulation material

(D) enclosure material

42. The ratio of the projected area of the rotor to the swept area of the rotor is known as

(A) Tip speed ratio
(B) Torque coefficient
(C) Solidity
(D) Power coefficient

43. The calorific value of biogas is

(A) 500 – 550 kJ/kg
(B) 2094 – 2303 kJ/kg
(C) 5000 – 5500 kJ/kg
(D) 20935 – 23028 kJ/kg

44. One mantle lamp of 100 candle power capacity requires ———— m^3 of biogas per hour.

(A) 0.41 to 0.52
(B) 0.22 to 0.41
(C) 0.11 to 0.15
(D) 0.04 to 0.05

45. In anaerobic digestion process, during initial acid formation stage large amount of ———— will be released.

(A) CH_4
(B) CO_2
(C) H_2S
(D) NH_3

46. Generally, the total solid content of feed material is ———— % in dry fermentation process.

(A) <10%
(B) 10-20%
(C) 25-30%
(D) >40%

47. The resultant fuel in thermal gasification process is

(A) Producer gas
(B) Bio gas
(C) Biochar
(D) Bio oil

48. Formula for determining equivalent diameter of irregular shaped particles (a, b, c - maximum, internal and minimum mutually perpendicular dimensional.

(A) $\frac{(abc)^{1/2}}{a}$ (B) $\frac{(abc)^{1/3}}{a}$

(C) $\frac{(abc)}{3}$ (D) $(abc)^{1/3}$

49. The optimum moisture content of range for paddy harvesting is

(A) 16 - 18 (B) 12 - 14%

(C) 20 - 22% (D) 10 - 12%

50. In vacuum oven method, the moisture content of grain is determined by heating at _____ °C.

(A) 96°C (B) 72°C

(C) 100°C (D) 130°C

51. Determine the bone dry weight of 2 tonnes of paddy with 22% moisture content during drying

(A) 1780 kg (B) 220 kg

(C) 440 kg (D) 1560 kg

52. Higher percentage of open area in air-screen grain cleaners will result in

(A) Increase in capacity and decrease screening efficiency

(B) Decrease in capacity and decrease screen efficiency

(C) Increase in capacity and increase screening efficiency

(D) Decrease in capacity and increase screen efficiency

53. Dry milling of pulses is carried out by treating with linseed oil at the rate of _____ kg/tonne.

(A) 1.0 to 1.5
(B) 1.5 to 3
(C) 2.0 to 3
(D) 1.5 – 2.5

54. Germ from corn is separated by using

(A) Centrifuge
(B) Filteration
(C) Grinding
(D) Hydroclone

55. Which of the following is a continuous bucket elevator?

(A) Centrifugal discharge elevator
(B) Positive discharge elevator
(C) Marine leg elevator
(D) Super capacity bucket elevator

56. In best conveyor, spacing between idlers should not exceed

(A) 1.5 m
(B) 1.8 m
(C) 2.0 m
(D) 1.2 m

57. Name the fumigant used in storage of grains

(A) DDVP
(B) Malethion
(C) Methyl Bromide
(D) Ethylene

58. Insects are killed when the oxygen level in the intergranular space falls to about _____ by volume.

(A) 5%
(B) 4%
(C) 3%
(D) 2%

59. The oil content of shelled groundnuts is in the range of

(A) 20 - 25%
(B) 30 - 35%
(C) 45 - 50 %
(D) 55 - 60%

60. Boiling point elevation in evaporators can be estimated using

(A) Raoult's Law (B) Boyle's Law

(C) Duhring's Rule (D) Stoke's Law

61. The terminal velocity of the solid particle in a fluid medium is proportional to ———— of the diameter of the particle.

(A) Square (B) Square root

(C) Cube (D) Cube root

62. Cream separator works on the principle of ———— force.

(A) Gravitational (B) Centrifugal

(C) Abrasive (D) Impact

63. "The work required in crushing is proportional to the new surface created". This principle is

(A) Kick's law (B) Bond's law

(C) Rittinger's law (D) Work index

64. Hammer mill works on the principle of ———— force in size reduction.

(A) Centrifugal (B) Impact

(C) Abrasive (D) Gravitational

65. Sedimentation uses ———— forces to separate particulate material from fluid streams.

(A) Centrifugal (B) Impact

(C) Abrasive (D) Gravitational

66. The required gas composition in packaged foods is maintained throughout the storage period is known as

(A) Modified atmosphere packaging

(B) Controlled atmosphere packaging

(C) Vacuum packaging

(D) Active modified atmosphere packaging

67. Milk containing 3% fat and 8.5% SNF from the combination of fresh and reconstituted milk is generally referred to as

(A) double tonned milk

(B) homogenized milk

(C) toned milk

(D) standardised milk

68. In an efficiently homogenized milk, the fat globules are sub divided to less than or equal to

(A) 2 μm (micron meter)

(B) 0.5 μm

(C) 1 μm

(D) 3 μm

69. ———— is the method used to extract oil from oil seeds and juice from sugarcane.

(A) Cutting

(B) Shearing

(C) Tearing

(D) Crushing

70. An electrolux refrigerator is

(A) single fluid absorption system

(B) three non refrigerant absorbent system

(C) two fluid absorption system

(D) three fluid absorption system

71. In a vapour compression refrigeration cycle, enthalpy at suction: 190 kJ/kg, compressor = 210 kJ/kg, condenser = 80 kJ/kg, then the C.O.P. would be

(A) 5.0

(B) 4.5

(C) 5.5

(D) 6.5

72. The component of watershed management which is essential to provide the farmer affordable access to fuel for cooking, timber for bulding and wood for implement is

(A) Afforestation
(B) Pasture cultivation
(C) Silvi pasture
(D) Olericulture

73. Which of the following are the modes of participation under participatory rural appraisal?

(i) Participation to supply information
(ii) Active participation
(iii) Passive participation

(A) (i) and (ii) only
(B) (i) and (iii) only
(C) (ii) and (iii) only
(D) (i), (ii) and (iii)

74. The project proposals for watershed management which describes the watershed and its problems, economic justification for the protection and improvement is known as

(A) Work plans
(B) Maps
(C) Estimates
(D) Execution

75. A deep narrow gorge is called

(A) Rill
(B) Gully
(C) Ravine
(D) Canyon

76. The water collection in the farm pond is directly used for

(A) Fish culture alone
(B) Protective irrigation alone
(C) Both fish culture and protective irrigation
(D) Recreation alone

77. Which of the following is induced ground water recharge method?

(A) flooding
(B) basics
(C) ditch or furrow
(D) infiltration galleries

78. Which of the following can be studied using remote sensing and geographic information system?

(i) Forest cover

(ii) Forest ecosystem

(iii) Forest fire prediction

(iv) Strategies for forest protection

(A) (i), (ii), (iii)

(B) (i), (ii), (iv)

(C) (i), (iii), (iv)

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

79. In a toposheet with R.F.=$\frac{1}{50,000}$, one centimeter in the map represents ———— meter in the ground.

(A) 5

(B) 50

(C) 500

(D) 50000

80. The process of obtaining information based on energy reflected or emitted by objects in different wave bands of electromagnetic spectrum is called as

(A) Geographic Information System

(B) Global Positioning System

(C) Remote Sensing

(D) Information Technology

81. In air borne remote sensing, the successive photographs of terrain are taken in such a way that a ———— percent overlap in forward direction.

(A) 100

(B) 80

(C) 60

(D) 40

82. The groundnut harvesters available in India perform all the following operations except

(A) Digging and elevating

(B) Separating clods and soil

(C) Removal of groundnut pod from vines

(D) Windrowing the harvested plants

83. Plow bottoms with sharply turned mould boards do a superior job of pulvarization but require considerable

(A) Low vertical suction

(B) Low operational speed

(C) High cost

(D) Draft

84. The useful life of a wheel type tractor is

(A) 8 years

(B) 10 years

(C) 14 years

(D) 15 years

85. Thresher which are not fitted with aspirator unit have got only one blower which blows air in horizontal director is called as

(A) Aspirator thresher

(B) Drummy thresher

(C) Olpad thresher

(D) Hammermill thresher

86. The size for the self propelled combine varies from

(A) 2 to 4 meters

(B) 1 to 1.5 meter

(C) 1.5 to 1.75 meters

(D) 4.5 to 10 meters

87. The type of universal joint generally used on Farm Machinery is known as

(A) Cardan joint

(B) Cottor joint

(C) Knuckle joint

(D) Pin joint

88. Reduction in value of a machine with the passage of time is called as

(A) Depreciation

(B) Appreciation

(C) Salvage value

(D) Junk value

89. The perpendicular distance from wing of the share to the line joining the point of the share and heel to landside is called as

(A) Size of the plough
(B) Throat clearance
(C) Horizontal suction
(D) Vertical suction

90. A tillage system in which only isolated bands of soil are tilled is called as

(A) Strip tillage
(B) Minimum tillage
(C) Mulch tillage
(D) Rotary tillage

91. Electrolite used in tractor batteries for chemical reaction usually consist of about 35% ———— acid and 65% of distilled water.

(A) Nitric
(B) Sulphuric
(C) Hydrochloric
(D) Any acid

92. If two bullocks weighing 350 kg each are pulling an implement with a speed of 3 km/hr, the power developed by the bullock is equal to

(A) 2 hp
(B) 5.72 kW
(C) 0.572 kW
(D) 0.5 hp

93. In ———— lubrication system, oil is pumped directly to the crank shaft, connecting rod, piston pin and cam shaft of the engine through suitable paths of oil.

(A) Splash system
(B) Oil circulation system
(C) Forced feed system
(D) Direct injection system

94. ———— clutch is most popular in four wheel tractors.

(A) Dog
(B) Fluid coupling
(C) Friction
(D) Transmission

95. The specific fuel consumption limits for 36 to 55 Hb tractor fixed by Govt. of India is

(A) 205 g/PTO HP/hr

(B) 200 g/PTO HP/hr

(C) 195 g/PTO HP/hr

(D) 185 g/PTO HP/hr

96. Weight transfer is represented by

(A) $\frac{\text{Pull} \times \text{Hitch height}}{\text{Wheel base}}$

(B) $\frac{\text{Pull} \times \text{Wheel base}}{\text{Hitch height}}$

(C) $\frac{\text{Pull} \times \text{Hitch height}}{\text{Wheel treed}}$

(D) $\frac{\text{Pull} \times \text{Wheel base}}{\text{Wheel treed}}$

97. A pump in which the piston travel is perpendicular to the pump axis is known as

(A) Axial piston pump

(B) Radial piston pump

(C) Tangential piston pump

(D) Co-axial piston pump

98. The hydraulic brake works on the principle of

(A) Joules Law

(B) Pascal's Law

(C) Boyles Law

(D) Charles Law

99. With respect to engine, oil bath air cleaners are always maintained

(A) horizontally

(B) vertically

(C) 45' inclination

(D) 30' inclination

100. The principle of chain surveying is

(A) Triangulation (B) Parallelism

(C) Traversing (D) Resection

101. The curvature of the earth is ignored in

(A) geodetic surveying (B) plane surveying

(C) hydrographic surveying (D) trignometric surveying

102. Length of Gunter's chain is

(A) 20′ (B) 33′

(C) 66′ (D) 100′

103. A cross-staff is used for

(A) marking of survey station

(B) setting perpendicular lines to survey line

(C) alignment of a survey line

(D) setting a line at an angle to a survey line at a point

104. A 20 m chain is divided into

(A) 100 links (B) 150 links

(C) 200 links (D) 250 links

105. Open traverse is suitable in the survey of

(A) Ponds (B) Rivers

(C) Estates (D) Forest

106. If a wooded area obstructs the chain line then it is crossed by the

(A) Projection line (B) Profile line

(C) Check line (D) Random line

107. The standard recording raingauge adopted in India is of

(A) Weighing bucket type
(B) Natural siphon type
(C) Tipping bucket type
(D) Telemetry type

108. A 6-h storm had 6 cm of rainfall and the resulting runoff was 3 cm. If the ϕ index remains at the same value the runoff due to 12 cm of rainfall in 9 h in the catchment is

(A) 4.5 cm
(B) 6.0 cm
(C) 7.5 cm
(D) 9.0 cm

109. An intermittent stream

(A) has water table above the stream bed throughout the year
(B) has only flash flows in response to storms
(C) has flows in the stream during wet season due to contribution of ground water
(D) does not have any contribution of groundwater at any time

110. Direct runoff is made up of

(A) surface runoff, prompt interflow and channel precipitation
(B) surface runoff, infiltration and evapotranspiration
(C) overland flow only
(D) rainfall and evaporation

111. The geophysical method of ground water exploration which is suitable for both cased and uncased formation is

(A) electrical resistivity method
(B) electric logging
(C) gamma ray logging
(D) seismic refraction surveying

112. The optimum length of a well screen for a tube well in a confined aquifer should extend to ————————% of the depth of aquifer.

(A) 50-60%
(B) 60-70%
(C) 70-80%
(D) Full depth

113. Application of any plant residues or the other materials to cover the top soil surface is called

(A) Tillage
(B) Mulch tillage
(C) Mulching
(D) Crop cover

114. The graded bunds are not suitable for construction on the land slopes greater than

(A) 2%
(B) 6%
(C) 10%
(D) 20%

115. Which of the following is least permanent of all check dams?

(A) Woven wire dam
(B) Brush dam
(C) Loose rock dam
(D) Plank dam

116. Which of the following is the most common gully control structure?

(A) Check dam
(B) Drop structure
(C) Chute spill way
(D) Drop inlet spill way

117. Among the three types of movement of soil particles by wind erosion, which one is responsible for transporting maximum portion of soil along the surface of ground?

(A) Suspension
(B) Saltation
(C) Surface creep
(D) All the three movements contribute equally

118. Which of the following statement(s) is/are true?

(i) A wind break is any type of barrier for protection from winds
(ii) Wind breaks are longer than shelter belts
(iii) An ideal form of shelter belt is pyramidical

(A) (i) and (ii) only
(B) (i) and (iii) only
(C) (ii) and (iii) only
(D) (i), (ii) and (iii)

119. Suspension accounts for ———— per cent of total soil loss movement by wind.

(A) 15
(B) 35
(C) 50
(D) 75

120. USLE equation is presented by

(A) Hermsmeier (B) Mutchler

(C) Lal (D) Wischmeier

121. Projects having a culturable command area of ———— ha to ———— ha are classified as medium irrigation projects.

(A) 1000 to 2000 (B) 2000 to 10,000

(C) 10,000 to 15,000 (D) 15,000 to 20,000

122. Which of the following statement(s) is/are true?

(i) The structure of soil is dynamic

(ii) Soil structure regulates porosity

(iii) Platy structures normally aid free drainage

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

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

123. A 660 cm^3 soil core taken by a core sampler from a field weighed 1.055 kg on oven drying. True specific gravity of soil was 2.65. Determine the porosity of the soil

(A) 60% (B) 40%

(C) 0.06% (D) 0.04%

124. Match the following :

	Property		Physical dimension
(a)	Hydraulic conductivity	1.	L
(b)	Intrinsic permeability	2.	LT^{-1}
(c)	Hydraulic radius	3.	ML^{-3}
(d)	Bulk density	4.	L^2T^{-1}

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

125. Match the following :

(a)	Contour furrow irrigation	1.	When general slope is gradual and very little
(b)	Straight border irrigation	2.	Soils that bake and form crust
(c)	Basin irrigation	3.	Adopted is uneven and rolling topography
(d)	Corrugation irrigation	4.	Suited for fruit crops

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

126. The width of a border strip usually ranges between

(A) 1 to 5 m
(B) 2 to 10 m
(C) 3 to 15 m
(D) 4 to 20 m

127. Inflow-outflow method can be used to determines ———— in furrows.

(A) Depth of flow
(B) Width of furrow
(C) Soil moisture
(D) Infiltration

128. A high pressure revolving head sprinkler operates at a pressure of ———— KSC.

(A) 0.25
(B) 0.5
(C) 0.75
(D) 2

129. The type of sprinkler heads adopted for irrigating lawns are

(A) Pop-up sprinklers
(B) Micro-sprinklers
(C) Rotary sprinklers
(D) Rain gun

130. Which of the following is/are correct?

I. The farm stead should be located near the centre of the farm

II. Site for farm stead should have high elevation and good drainage

III. The farm stead should be near a source of permanent water supply

(A) I and II (B) II and III

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

131. The percentage of area of a farm stead out of the total farm area should be

(A) 1 to 2% (B) 2 to 4%

(C) 3 to 5% (D) 4 to 6%

132. Which of the following is/are correct?

I. In Bedroom of farm house, cross ventilation with one side exposed to the prevailing breeze

II. The kitchen must have an eastern location

III. The store room should be located near the kitchen

(A) I and II (B) II and III

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

133. The wall constructed for seepage control around masonry structures is called

(A) End sill (B) Cut-off wall

(C) Head wall (D) Apron

134. The channel crossing structure used when the road fill is sufficiently high and the channel bed lies on the field surface is

(A) Inverted siphon (B) Flume

(C) Culvert (D) Turn out

135. The Gutters in the stanchion barn should have a minimum slope of ———— %.

(A) 1% (B) 2%

(C) 3% (D) 4%

136. During slump test performed to determine the plasticity of concrete, if concrete slumps more than ———— cm it should be rejected.

(A) 10 (B) 12.5

(C) 15 (D) 17.5

137. In wire floored poultry houses, the floor is placed about ———— cm above ground level.

(A) 30 (B) 35

(C) 40 (D) 45

138. Stanchion barn is also called the

(A) general purpose barn (B) open air barn

(C) loose housing barn (D) milking parlour

139. The average floor area required per animal for cow stall with alleys is in the range of

(A) 2.20 sq.m. (B) 3.50 sq.m.

(C) 5.20 sq.m. (D) 6.00 sq.m.

140. The passage between the outer wall and the manger is called

(A) Milking parlour (B) Cow stall

(C) Feed alley (D) Gutters

141. The barn structure where the cows and buffaloes are reared where the roughages, concentrate, etc are supplied by co-operative organisation is called

(A) Community barn (B) Pen barn

(C) Stanchion barn (D) Hering bone barn

142. Maximum Power Point Tracking (MPPT) is used

(A) to protect the battery from over charging

(B) to protect the PV module from over power production

(C) to match the impedance of the module with that of the load/battery

(D) to track the sun to produce more power

143. Estimate the available wind power at 10 m/s wind velocity in a wind will rotor diameter of 60 m.

(A) 173.2 kw (B) 346.4 kw

(C) 1732.3 kw (D) 3464.7 kw

144. Which of the statements are correct?

Solar photo voltaics is

(i) Conversion of light into electricity

(ii) Generation of electromotive force from the ionizing solar radiation

(iii) Conversion of solar thermal energy into electricity

(iv) Electrical energy generation using solar heliostat

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

(C) (iii) and (iv) (D) (iv) and (i)

145. Yaw mechanism in horizontal axis wind turbine helps to

(A) turn the rotor according to the wind direction

(B) raise the rotor according to wind availability

(C) change the pitch angle of the rotor

(D) rotate rotor according to the wind power

146. Savonius rotors are ———— type wind machines.

(A) self starting (B) high speed

(C) high efficiency (D) low solidity

147. The thermo chemical conversion efficiency of gasification process is

(A) 10-30%
(B) 30-60%
(C) 60-90%
(D) more than 90%

148. In bio mass gasification process, the Boudouard reaction is given by

(A) $C + CO_2 \rightarrow 2CO$
(B) $C + 2H_2 \rightarrow CH_4$
(C) $C + H_2O \rightarrow CO + H_2$
(D) $C + O_2 \rightarrow CO_2$

149. The charcoal produced is about ———— kg, when 100 kg dry biomass is fed in charcoal retorts operating at 600° C.

(A) 30
(B) 50
(C) 70
(D) 90

150. Traditional charcoal making is done by the following process

(A) Combustion
(B) Gasification
(C) Pyrolysis
(D) Anaerobic fermentation

151. The common micro organism used for ethanol production is

(A) Methanogenic bacteria
(B) Acedogenic bacteria
(C) Saccharomyces cerevisiae
(D) Enzymes

152. The ozone layer acts as an efficient filter for harmful solar UV-B rays is in the ———— region of the earth's atmosphere.

(A) Troposphere
(B) Stratosphere
(C) Mesosphere
(D) Hetrosphere

153. Recirculatory batch dryers are

(A) batch non mixing type grain dryer

(B) batch mixing type grain dryer

(C) continuous flow non mixing type grain dryer

(D) continuous flow mixing type grain dryer

154. Equation for the conversion of percent moisture content in wet basis (m) to percent moisture content on dry basis (M) is

(A) $M = \frac{100 - m}{100\,m}$

(B) $M = \frac{100\,m}{100 - m}$

(C) $M = \frac{m - 100}{100\,m}$

(D) $M = \frac{100 - m}{100}$

155. The moisture content of parboiling paddy has to be brought down to ———— % for better milling and storage.

(A) 12 - 14

(B) 14 - 16

(C) 16 - 18

(D) 18 - 20

156. Parboiling of Paddy is a ———— process.

(A) Soaking

(B) Steaming

(C) Drying

(D) Hydrothermal

157. Centrifugal dehusker removes husk from paddy based on ———— force.

(A) Frictional

(B) Shear

(C) Compression

(D) Impact

158. The differential speed of break rolls of a wheat mill is in the proportion of

(A) 3.5 : 1

(B) 3 : 1

(C) 2.5 : 1

(D) 2 : 1

159. _____ is commonly used for the production of activated carbon.

(A) Coconut shell
(B) Coconut husk
(C) Coconut kernel
(D) Coirpith

160. _____ hastens the ripening of fruits.

(A) Ethylene
(B) Carbon dioxide
(C) Nitrogen
(D) Carbon monoxide

161. Stefan - Boltzmann's Law is related to _____ heat transfer.

(A) Conduction
(B) Forced convection
(C) Radiation
(D) Natural convection

162. Thermal diffusivity is given by

(A) $\frac{C_p}{K\rho}$
(B) $p/K\rho\, C_p$
(C) $\frac{K}{\rho\, C_p}$
(D) $\frac{K\, C_p}{\rho}$

163. The economy of evaporation of given by

(A) $1 - \frac{\text{mass of water evaporated}}{\text{mass of steam supplied}}$

(B) $1 - \frac{\text{mass of steam supplied}}{\text{mass of water evaporated}}$

(C) $\frac{\text{mass of water evaporated}}{\text{mass of steam supplied}}$

(D) $\frac{\text{mass of steam supplied}}{\text{mass of water removed}}$

164. Blanching of vegetables is done to

(i) Inactivate enzymes
(ii) To destroy peroxides
(iii) To kill pathogens
(iv) To kill micro organisms

(A) (iii) and (iv)
(B) (ii) and (iii)
(C) (i) and (iv)
(D) (i) and (ii)

165. Decimal reduction time in microbial destruction is inversely proportional to

(A) Universal gas constant
(B) Initial concentration
(C) Z value
(D) Reaction rate

166. An extruder does not have the following component

(A) Screw
(B) Barrel
(C) Die
(D) Compressor

167. Separation of liquid from solids by application of pressure is known as

(A) Extraction
(B) Leaching
(C) Filtration
(D) Expression

168. Heat is generated due to _____ in food material in microwave heating of foods.

(A) Explosion of molecules
(B) Electroporation
(C) Electrical resistance
(D) Change of polarity

169. The main objective behind demarcating the priority watersheds is to

(A) Assess runoff

(B) Estimating area extent

(C) Carry out soil and water conservation activities

(D) Prepare hydrograph

170. Watersheds and macro watersheds can be delineated with the aid of ———— scale imagery.

(A) 1 : 2,00,000

(B) 1 : 1,00,000

(C) 1 : 50,000

(D) 1 : 25,000

171. In watershed domain, what does SWAT stands for?

(A) Strength and Weakness Assignment Technique

(B) Soil and Water Assessment Tool

(C) Soil and Water Analysis Tool

(D) Soil and Water Tool

172. Geo-Hydrological unit with a common drainage outlet is called

(A) Catchent area

(B) Command area

(C) Ayacut area

(D) Watershed

173. Main principles of watershed management includes

I. Utilizing the land based on its capability

II. Protecting fertile top still

III. Minimizing sitting up of tanks, reservoirs

(A) I and II only

(B) II and III only

(C) I and III only

(D) I, II and III

174. Augmenting the entry of rain water or surface water into the geological formation by changing the natural conditions of the soil profile is defined as

(A) Watershed development

(B) Artificial ground water recharge

(C) Ground water exploration

(D) Bio drainage

175. Maximum rate of feeding of water by the recharge well to the aquifer is known as

(A) Specific capacity

(B) Recharge capacity

(C) Specific recharge rate

(D) Well discharge

176. Which of the following statements are TRUE, for selecting a site to construct a farm Pond?

(i) Site should not cause excessive seepage loss

(ii) Pond should be near to the area where water is to be used

(iii) Large area of shallow water to be avoided

(A) (i) and (ii) only

(B) (i) and (iii) only

(C) (ii) and (iii) only

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

177. The capacity of farm pond is computed by using

(A) Trapezoidal formula

(B) Rational formula

(C) Clark's formula

(D) Rhosla's formula

178. A live hedge planted just above the bench acts as a soil filter preventing soil erosion with time makes the terraced bed

(A) more sloppy

(B) less sloppy

(C) flatter

(D) adverse slop

179. In hay harvesters of flail shredder type the knives rotating in ———————— plane parallel with the direction of travel.

(A) Vertical

(B) Horizontal

(C) Tilting

(D) Circular

180. The size of the bund former in determined by measuring the maximum horizontal distance between the

(A) Bunds

(B) Two rear ends of the forming boards

(C) Two front sides of the forming boards

(D) Two adjacent bunds

181. If the seed emergence is 90% and recommenced plant population is 50,000 plants per hectare at row spacing of 60cm and two seeds are dropped per hill the spacing between hills in equal to

(A) 30 cm

(B) 6 cm

(C) 60 cm

(D) 15 cm

182. In manually operated knapsack sprayer, a pressure of ———————— kg/cm^2 is maintained in the pressure chamber.

(A) 3 - 5

(B) 6 - 9

(C) 12 - 15

(D) 20 - 25

183. The power required to pull a four bottom, 30 cm plough working at 20 cm depth, 4 kms per hour speed and soil resistance of 0.7 kg/cm^2 is

(A) 18.29 hp

(B) 28.39 kw

(C) 36.53 kw

(D) 18.29 kw

184. A machine to cut herbage crops and leave them in Swath is known as

(A) Mower
(B) Reaper
(C) Reaper binder
(D) Sickle

185. Part of the sowing machine which conveys the seeds or fertilizer from the delivery tube to the furrow is called as

(A) Boot
(B) Seed tube
(C) Seed conveyor
(D) Standard

186. A method of plonting, in which row to row and plant to plant distance is uniform is called as

(A) Hill dropping
(B) Check row planting
(C) Broadcasting
(D) Seed dropping behind the plough

187. A roller comprising a number of thick discs each having the form of frustum of a cone with smooth periphery joined base to base and placed on the same shaft without gap is called

(A) Cage roller
(B) Weeder Mulchev
(C) Cambridge roller
(D) Land Packer

188. Calculate the theoretical area covered per day of 8 hours by a tractor drawn four bottom 35 cm plough if the speed of the ploughing is 6 km per hour

(A) 6.72 hectare
(B) 6.32 hectare
(C) 6.52 hectare
(D) 6.42 hectare

189. The angle at which the plane of the cutting edge of the disc is inclined to the direction of travel is called as

(A) Disc angle
(B) Tilt angle
(C) Cutting angle
(D) Bevel angle

190. The rate of circulation of the water pump should not be less than

(A) 0.2 litre/BHP/min

(B) 0.5 litre/BHP/min

(C) 0.4 litre/BHP/min

(D) 0.3 litre/BHP/min

191. The pin that connects the piston to the connecting rod is known as

(A) Crank pin

(B) Connection pin

(C) Gudgeon pin

(D) Steel pin

192. The change of state of a gas with respect to pressure and volume when temperature remains constant is known as

(A) Isothermal change

(B) Isobaric change

(C) Adiabatic change

(D) Total change

193. Central Region Farm machinery training and testing institute is located at

(A) HISSAR

(B) ANANTPUR

(C) BUDNI

(D) BHOPAL

194. Power developed by an average pair of bullocks is about

(A) 1 hp

(B) 1.2 hp

(C) 2.0 hp

(D) 0.5 hp

195. A ———————— is a device used for increasing the air pressure into the engine so that more fuel can be burnt and engine output increased.

(A) Air charger
(B) Blow charger
(C) Super charger
(D) Compresses

196. When an implement is mounted on a three point hitch, the lines projected from the lower and upper links intersect at a point known as

(A) Centre of gravity
(B) Centre of pull
(C) Centre of draft
(D) Line- of pull

197. Most engine tests are conducted using ———————— type dynamometer.

(A) Transmission
(B) Resistance
(C) Absorption
(D) Load

198. Bekker equation for traction theory is

(A) $F = AC + W \tan\theta$
(B) $F = AW + C \tan\theta$
(C) $F = CW + A \tan\theta$
(D) $F = A(C + W \tan\theta)$

199. The horizontal distance between the front and rear wheels of a tractor measured at the ground contact is known as

(A) Wheel tread
(B) Wheel base
(C) Turning space
(D) Ground clearance

200. The commercial diesel fuels have got cetane rating varying from

(A) 40 to 70
(B) 30 to 60
(C) 20 to 50
(D) 45 to 75

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

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