2024

Paper – I

AGRICULTURAL ENGINEERING

(Degree Standard)

Duration : Three Hours]   **[Total Marks : 300**

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

IMPORTANT INSTRUCTIONS

1. You will be supplied with this question booklet 15 minutes prior to the commencement of the examination.

2. This question booklet contains **200** questions. Before answering the questions, you shall check whether all the questions are printed serially and ensure that there are no blank pages in the question booklet. **If any defect is noticed in the question booklet, it shall be reported to the invigilator within the first 10 minutes and get it replaced with a complete question booklet. If the defect is reported after the commencement of the examination, it will not be replaced.**

3. Answer all the questions. All the 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 shade the answers. Instructions regarding filling of answers etc., which are to be followed mandatorily, are provided in the answer sheet and in the memorandum of admission (Hall Ticket).

6. You shall write and shade your question booklet number in the space provided on page one of the answer sheet with **BLACK INK BALL POINT PEN.** If you do not shade correctly or fail to shade the question booklet number, your answer sheet will be invalidated.

7. Each question comprises of five responses (answers) : i.e. (A), (B), (C), (D) and (E). You have to select ONLY ONE correct answer from (A) or (B) or (C) or (D) and shade the same in your answer sheet. If you feel that there are more than one correct answer, shade the one which you consider the best. **If you do not know the answer, you have to mandatorily shade (E).** In any case, choose ONLY ONE answer for each question. If you shade more than one answer for a question, it will be treated as a wrong answer even if one of the given answers happens to be correct.

8. 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 room during the time of the examination. After the examination, 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.

9. **You should not make any marking in the question booklet except in the sheets before the last page of the question booklet, which can be used for rough work. This should be strictly adhered to.**

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

SPACE FOR ROUGH WORK

1. Find the incorrect statement

   (i) The movement of soil particle generally less than 0.1 mm diameter is known as suspension

   (ii) The size of the particles varies from 0.05 mm to 0.5 mm is called saltation

   (iii) Quantity of soil moved through wind is directly proportional to the square root of the soil particles diameter

   (iv) Wind erosion intensity is directly proportional to soil cloudiness factor

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

2. In a wind break, when the wind direction is at right angles to the wind break, the reduction in wind velocity on the leeward side ranges from

   (A) 20 – 40%   (B) 40 – 80%
   (C) 80 – 90%   (D) 60 – 80%
   (E) Answer not known

3. Permanent gully control structure is

   (A) Loose rock dam   (B) Drop spillway
   (C) Brush wood dams   (D) Log wood check dam
   (E) Answer not known

4. The practice of conducting field operations such as ploughing, planting and cultivating across the land slope is called as

   (A) Strip cropping   (B) Contour building
   (C) Contour farming   (D) Terracing
   (E) Answer not known

5. The broad base terrace is also known as

   (A) Level terrace   (B) Mangum terrace
   (C) California terrace   (D) Graded terrace
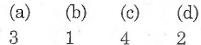   (E) Answer not known

6. Match the following :

   (a) Vulnerability of susceptibility of soil   1. Erosivity
   (b) Rainfall energy of detach the   2. Rill erosion
       soil particles
   (c) Last stage of water erosion   3. Erodibility
   (d) Micro channel erosion   4. Gully erosion

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

   (E) Answer not known

7. The biological measures alone are generally adopted when the land slope are

   (A) < 2%   (B) 2 – 6%
   (C) 6 – 10%   (D) 10 – 16%
   (E) Answer not known

8. Water runs over the soil, compresses the soil, as a result the air present in the voids exerts a pressure on the soil particles is related to

   (A) Abrasion   (B) Hydraulic action
   (C) Attrition   (D) Solution
   (E) Answer not known

9. The source of photogrammetric data used to prepare the watershed topography map is

(A) DTM
(B) DEM
(C) DTM and DEM
(D) 2D aerial photographs
(E) Answer not known

10. If e_1 and e_2 are the void ratio before and after consolidation respectively and y is the depth of soil to be consolidated, then, the height of settlement of an earthern embankment of a farm pond is computed by

(A) $s = \left(\dfrac{e_1 - e_2}{1 + e_1} \right) y$
(B) $s = \left(\dfrac{1 + e_1}{e_1 - e_2} \right) y$

(C) $s = \left(\dfrac{e_2 + e_1}{1 + e_2} \right) y$
(D) $s = \left(\dfrac{e_2 - e_1}{1 + e_2} \right) y$

(E) Answer not known

11. —————— ponds are small water storage structures constructed across natural streams to impound the surface runoff during monsoon rains and store it for longer time to raise the groundwater level

(A) Dugout farm ponds
(B) Embankment type farm pond
(C) Spring or creek fed ponds
(D) Off season ponds
(E) Answer not known

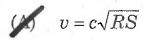12. The zone of influence of a percolation pond would be upto

(A) 500 m
(B) 5 km
(C) 15 m
(D) 1.5 km
(E) Answer not known

13. In Indian status of land use which of the following has maximum area

    (A) Area under non agricultural use

    (B) Area under good forest

    (C) Forest wastelands under poor tree cover, cultivable waste lands

    (D) Current and old follows, permanent pastures

    (E) Answer not known

14. Which of the following channel has the highest hydraulic radius

    (A) Triangular   (B) Parabolic

    (C) Trapezoidal   (D) Flatter

    (E) Answer not known

15. The fern shape watersheds are very common in

    (A) Hilly terrains   (B) Arid zones

    (C) Plane area   (D) Semi-arid tropics

    (E) Answer not known

16. The ratio of basin area to the square of basin length is called

    (A) Form factor   (B) Circulatory ratio

    (C) Elongation ratio   (D) Compactness coefficient

    (E) Answer not known

17. National Rainfed Area Authority (NRAA) was formed during ———— to co-ordinate all watershed management works in India.

    (A) 1991   (B) 2000

    (C) 2006   (D) 2008

    (E) Answer not known

18. Minimum flow velocities should be around —————— m/s in order to prevent sedimentation of fine sands in irrigation channel.

   (A) 0.2
   (B) 0.3
   (C) 0.4
   (D) 0.5
   (E) Answer not known

19. The Brick jelly roofing is a

   (A) Madras terrace roofing
   (B) Mud terrace roofing
   (C) Mud Phuska terracing with tile paving
   (D) Lime concrete terracing with tile paving
   (E) Answer not known

20. The usable life of Polythene film of polyhouses ranges between —————— years.

   (A) 2 - 3
   (B) 3 - 4
   (C) 5 - 8
   (D) 8 - 10
   (E) Answer not known

21. The minimum flow velocity required to prevent sedimentation of fine sands in the underground pipeline system is

   (A) 0.5 m/s
   (B) 1.0 m/s
   (C) 1.5 m/s
   (D) 2.0 m/s
   (E) Answer not known

22. The seepage control around turnout box is achieved by

    (A) End sill

    (B) Baffle wall

    (C) Side sill

    (D) Anti-seep collar

    (E) Answer not known

23. Chezy's formula for finding out the velocity of flow in open channels is

    (A) $v = c\sqrt{RS}$

    (B) $v = \dfrac{1}{n} R^{\frac{2}{3}} S^{\frac{1}{2}}$

    (C) $v = \dfrac{1}{n}\sqrt{RS}$

    (D) $v = \sqrt{\dfrac{8gRS}{f}}$

    (E) Answer not known

24. The cows are housed and milked in the same building called

    (A) Stanchion barn

    (B) Loose housing barn

    (C) Lofing type barn

    (D) Milk house system

    (E) Answer not known

25. Which of the following method is not used for cost estimation of building?

   I.   Plinth area method
   II. Lintel area method
   III. Cubic meter method
   IV. Cost from materials and labour

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

26. The projecting stone provided to support the Roof Truss is

   (A) Sill   (B) Corbel
   (C) Cornice   (D) Coping
   (E) Answer not known

27. The Slump test is performed to measure ———————— of the concrete.

   (A) Compressive strength   (B) Shrinkage
   (C) Plasticity   (D) Setting time
   (E) Answer not known

28. Cutting a triangular portion of half the width but of full length of brick is called as

   (A) King closer   (B) Queen closer
   (C) Bevelled closer   (D) Mitred closer
   (E) Answer not known

29. In reaper, after how many working hours the knife bar should be sharpened

   (A) 5   (B) 10
   (C) 20   (D) 30
   (E) Answer not known

30. In Springer, the height of the nozzle is too low from the above crop, the overlap of sprang pattern will be

   (A) Large overlap   (B) Small overlap
   (C) No overlap   (D) correct overlap
   (E) Answer not known

31. Rotary hoe attachments for row crop cultivators are very effective at _____ km/h for early post emergence cultivation of cotton crop

   (A) 5 to 8   (B) 8 to 10
   (C) 10 to 15   (D) 15 to 28
   (E) Answer not known

32. The minimum pressure requirement for satisfactory working of fan nozzle

   (A) 1.0 kg/cm^2 (B) 1.5 kg/cm^2
   (C) 2.0 kg/cm^2 (D) 2.5 kg/cm^2
   (E) Answer not known

33. A power sprayer is discharging 35 lpm at the designed pressure. If the pressure is doubled, the discharge of the sprayer would be

   (A) 50 lpm   (B) 70 lpm
   (C) 5.92 lpm   (D) 1225 lpm
   (E) Answer not known

34. Harrow with tough flexible teeth and suitable for working in hard and stony soils is

   (A) Disc Harrow   (B) Spike Tooth Harrow

   (C) Acme Harrow   (D) Blade Harrow

   (E) Answer not known

35. In Disc Harrow, the angle of Disc gang varies the —————— of plough varies.

   (A) Depth of cut   (B) Width of cut

   (C) Angle of cut   (D) Width and Depth of cut

   (E) Answer not known

36. Field efficiency of an implement is the

   (A) Ratio of Theoretical field capacity to effective field capacity

   (B) Ratio of time loss in turning to effective operating time

   (C) Ratio of effective field capacity to theoretical field capacity

   (D) It is the functional effectiveness of a machine

   (E) Answer not known

37. According to BIS, the total grain loss from a mechanical thresher should not be

   (A) More than 5 percent   (B) More than 10 percent

   (C) More than 20 percent   (D) More than 25 percent

   (E) Answer not known

38. An open trench left in between the two adjacent strips of land after finishing the ploughing is called

   (A) Furrow Slice   (B) Furrow Wall

   (C) Open Furrow   (D) Dead Furrow

   (E) Answer not known

39. Which is the correct processing flow chart for rubber?

   (i) bark cutting → coagulation of latex → passing through rollers → cutting and smoking

   (ii) bark cutting → passing through rollers → coagulation of latex → cutting and smoking

   (iii) passing through rollers → bark cutting → coagulation of latex → cutting and smoking

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

40. Among the various spices cultivated in India ———————— called 'Queen of Spices'.

   (A) Cardamom   (B) Chilli
   (C) Pepper   (D) Turmeric
   (E) Answer not known

41. A storage method in which the oxygen level is reduced and/or carbon-di-oxide level is increased to supplement to refrigeration can provide extended storage life of fruits and vegetables is termed as

   (A) Refrigerated storage   (B) Frozen storage
   (C) Modified atmosphere storage   (D) Hypo barric storage
   (E) Answer not known

42. The widely used fumigant for silos

   (A) Methyl bromide and CO_2

   (B) Phosphine and Freon

   (C) Methyl and Phosphene bromide

   (D) Freon and CO_2

   (E) Answer not known

43. One among the following fumigant does not affect the viability of dry seeds but reduces the viability of moist seed

(A) Phosphine

(B) Hydrogen cyanide

(C) Ethylene dibromide

(D) Carbon disulphide

(E) Answer not known

44. Match the correct pair :

Moisture content   Effect on seed

(a) 6-10%   1. Germination occurs

(b) 12-14%   2. Heat generation

(c) 18-20%   3. Fungal growth

(d) 45-50%   4. Safe for sealed storage

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

(E) Answer not known

45. Metering device for seed and chemicals is an important component of a
——————— for uniform application of chemical over the surface of seed.

(A) Seed dryer

(B) Seed conveyor

(C) Seed treater

(D) Seed cleaner

(E) Answer not known

46. If heat is transferred radially through a pipe of inside and outside radius r_1 and r_2 respectively and length 'l' in steady state with K as the thermal conductivity of the material, the thermal resistance of pipe is given by

(A) $\dfrac{1}{2\pi r l} \cdot \ln\left(\dfrac{r_1}{r_2}\right)$

(B) $\dfrac{1}{2\pi r l} \ln\cdot\left(\dfrac{r_2}{r_1}\right)$ ✓

(C) $2\pi r l \cdot \ln\cdot\left(\dfrac{r_2}{r_1}\right)$

(D) $2\pi r l\left(\dfrac{r_2}{r_1}\right)$

(E) Answer not known

47. The percentage of volume of inter grain space to the total volume of grain bulk is

(A) Sphericity

(B) Porosity ✓

(C) Roughness of Grain

(D) Void space

(E) Answer not known

48. Match the following :

(a) Metric chain   1. 66 Feet
(b) Engineer's chain 2. 20 Metre
(c) Gunter's chain   3. 33 Feet
(d) Revenue chain   4. 100 Feet

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

(E) Answer not known

49. Identify the arithmetical check applied in Height of Instrument method for calculation of reduced level from the following :

1. $\sum BS - \sum FS$

2. $\sum RISE - \sum FALL$

3. $\sum FB - \sum BB$

4. LAST RL – FIRST RL

(A) 1 and 2   (B) 1, 2 and 3

(C) 1 and 4   (D) 2, 3 and 4

(E) Answer not known

50. It is generally taken as horizontal if the land slope is less than

(A) 1°   (B) 3°

(C) 5°   (D) 7°

(E) Answer not known

51. The IDF relationship design deals with

(A) Rainfall data from a self recording gauge available for a longer period

(B) Rainfall Vs Runoff

(C) Intensity of rainfall of specified return period and of duration equal to critical time of concentration

(D) Runoff Vs Time of concentration

(E) Answer not known

52. ——————— is a type of rain gauge gives a mass curve of rainfall.

(A) Tipping Bucket   (B) Weighing Bucket

(C) Natural Siphon   (D) Symon Rain Gauge

(E) Answer not known

53. The storage co-efficient of a confined aquifer is

(A) Volume of water released from the storage per unit surface area and unit change in Hydraulic head

(B) Volume of water released from the entire aquifer

(C) Volume of water a released from the aquifer storage per unit time drained by gravity

(D) Ability of aquifer to transmit fluid

(E) Answer not known

54. In electrical resistivity method, the number of electrodes used is

(A) Two
(B) Four
(C) Three
(D) One
(E) Answer not known

55. Their equation is valid for

(A) Confined aquifer under unsteady flow condition towards well

(B) Unconfined aquifer under unsteady flow condition towards well

(C) Perched aquifer only

(D) Aquiclude only

(E) Answer not known

56. The use of drilling fluid during well drilling is

(A) To stabilize the hole wall
(B) To properly align the well
(C) To increase the drilling rate
(D) To rotate the bailer, easily
(E) Answer not known

57. Atmometer is used to measure

   (A) Infiltration rate   (B) Evapotranspiration rate

   (C) Permeability rate   (D) Seepage rate

   (E) Answer not known

58. Match the following :

   (a) Interflow   1. One atmosphere

   (b) Percolation   2. Field capacity

   (c) 1036 cm of water   3. Soil moisture percentage

   (d) Available water   4. Intrinsic permeability

   (e) Apparent specific
       gravity   5. Lateral Seepage

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

   (E) Answer not known

59. Discharge through a suppressed rectangular weir is computed by the formula

   (A) $Q = 0.00184\, LH^{3/2}$ (B) $Q = 0.0184\, L^{3/2} H^{1/2}$

   (C) $Q = 0.0184\, LH^{3/2}$ (D) $Q = 0.0184(L - 0.2H)H^{3/2}$

   (E) Answer not known

60. _____% of liquid ballast should be provided in a tractor tyre

   (A) 65

   (B) 75

   (C) 55

   (D) 60

   (E) Answer not known

61. The main drawback for layering drip irrigation for close growing rows crop is

   (A) Clogging of nozzles will occur

   (B) The number of laterals required will be high leading to high cost

   (C) Accumulation of salt will occur

   (D) Requirement of more labour

   (E) Answer not known

62. The pressure drop usually allowed in a media (sand) filter is about

   (A) 1 m   (B) 2 m

   (C) 3 m   (D) 4 m

   (E) Answer not known

63. The ratio of actual discharge to the theoretical discharge of an orifice is called

   (A) Coefficient of storage   (B) Coefficient of velocity

   (C) Coefficient of discharge   (D) Coefficient of contraction

   (E) Answer not known

64. The fraction of water entering the soil that must pass through the root zone in order to prevent soil salinity from exceeding a specified value is called

    (A) Drainage coefficient   (B) Leaching requirement
    (C) Saturation percentage   (D) Cation Exchange capacity
    (E) Answer not known

65. Which among the following statement is not a principal measures adopted in the management of salaine soils.

    (A) Leaching of salts to maintain salt balance in root zone
    (B) Growing crops based on their sensitivity to salt concentration
    (C) Adoption of appropriate agronomic and cultural practices
    (D) Keeping the land fallow
    (E) Answer not known

66. Interceptor drains are located at the

    (A) Ridges of watershed   (B) Links of field drains
    (C) Bottom of hill sides   (D) Joining point of streams
    (E) Answer not known

67. Expant LVDT in displacement sensor

    (A) Linear variable digital technology
    (B) Linear variable digital transformer
    (C) Linear variable differential Transformer
    (D) Liner variable differential technology
    (E) Answer not known

68. Which of the following engine working hours is not recommended for the periodical Maintenance of tractor

(A) 8 to 10   (B) 50 to 60

(C) 60 to 100   (D) 100 to 120

(E) Answer not known

69. The plantery gear system in which a cluster of gears, are called planet gears. The orbit of planet gears rotate about

(A) Pinion gear   (B) Sun gear

(C) Wing gear   (D) Pinion carrier

(E) Answer not known

70. As per the International standard basis the shape of PTO splines is —————, if PTO rotates at 1000 rpm.

(A) Involute   (B) Helical

(C) Spiral   (D) Straight

(E) Answer not known

71. The power available at the end of the tractor for pulling the trailed type implement is known as

(A) Indicated horse power   (B) Frictional horse power

(C) PTO power   (D) Draw bar power

(E) Answer not known

72. Power delivered by the engine and is available at the end of the crankshaft or flywheel is

   (A) Indicated Power   (B) Brake Power

   (C) Belt Power   (D) Frictional Power

   (E) Answer not known

73. Identify the correct statement: Valve clearance is the clearance between

   (A) Rocker arm and valve stem   (B) Cam and valve stem

   (C) Valve guide and valve stem (D) Push rod and valve stem

   (E) Answer not known

74. An average man can develop ———————— power for doing farm work

   (A) 0.1 HP   (B) 0.1 KW

   (C) 1 HP   (D) 0.01 HP

   (E) Answer not known

75. The inflate pressure of the power tiller tyre ranges from

   (A) 1.1 to 1.4 kg/cm²   (B) 0.8 to 1.0 kg/cm²

   (C) 2.10 to 2.50 kg/cm²   (D) 1.7 to 2.0 kg/cm²

   (E) Answer not known

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76. Thermostat valve fully opens at a temperature of ———————— for petrol engine

    (A) 82°C   (B) 90°C

    (C) 102°C   (D) 68°C

    (E) Answer not known

77. Clot on boiling test is carried out to determine

    (A) pH of milk   (B) Heat stability of milk

    (C) Bacterial contamination   (D) Adulteration

    (E) Answer not known

78. In a refrigerator, a component in which the liquid refrigerant gets evaporated under reduced and absorbs latent heat of vaporization is

    (A) Condenser   (B) Compressor

    (C) Evaporator   (D) Expansion valve

    (E) Answer not known

79. The process that makes a stable emulsion of milk fat and milk serum by mechanical treatment is

    (A) Centrifugation   (B) Pasteurization

    (C) Clarification   (D) Homogenization

    (E) Answer not known

80. Match the correct pair :

(a) Solvent extraction   1. 1% oil

(b) Mechanical expression 2. 7 – 8% oil

(c) Cake meal (Mechanical
    expression)   3. 60 – 70 oil recovery

(d) Cake meal (Solvent
    extraction)   4. 99% oil recovery

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

(E) Answer not known

81. Oil seeds are generally cooked prior to oil extraction for

(A) Drying   (B) Gelatinitation of starch

(C) Killing of Microbes   (D) Coagulation of proteins

(E) Answer not known

82. Statements

1. Drying involves heat transfer operations

2. Drying involves mass transfer operations

(A) 1 is correct   (B) 2 is correct

(C) 1 and 2 are correct   (D) 1 and 2 are not correct

(E) Answer not known

83. According to Kick's law, the Energy (E) required for size reduction of a product if X_p is length of the product and X_f is length of the feed is

(A) $E = c\left[\dfrac{1}{X_p} - \dfrac{1}{X_f}\right]$

(B) $E = c.\ln\left[\dfrac{X_f}{X_p}\right]$ ✓

(C) $\dot{E} = c\left[\dfrac{1}{X_p^{2}} - \dfrac{1}{X_f^{2}}\right]$

(D) $E = c\left[\dfrac{1}{\sqrt{X_p}} - \dfrac{1}{\sqrt{X_f}}\right]$

(E) Answer not known

84. The mixing index of two solids with initial and random fractions as S_0 and S_r respectively is denoted by

(A) $M = (S_0 - S)/(S_0 - S_r)$

(B) $M = S_0^{2} - S^2$

(C) $M = (S_0^{2} - S^2)/(S_0^{2} - S_r^{2})$ ✓

(D) $M = S_0^{2} - S_r^{2}$

(E) Answer not known

85. In a centrifugal separator, the centrifugal force acting on a particle rotating with linear velocity 'v' round the periphery with radius of rotation 'r' is given by

(A) $mv^2 w$

(B) $\dfrac{mv^2}{r}$ ✓

(C) $\dfrac{mv}{r^2}$

(D) $\dfrac{mv^2}{n}$

(E) Answer not known

86. Newton's law of cooling can be expressed by the equation

(A) $q = mcp\Delta T$

(B) $q = h_s A (T_a - T_s)$ ✓

(C) $q = kA\dfrac{dt}{dx}$

(D) $q = a + bt$

(E) Answer not known

87. Geothermal resource in India.

    (A) Tar desert
    (B) Sambal valley
    (C) Puga valley
    (D) Rann of kutch
    (E) Answer not known

88. The difference in height between high tide and low tide is termed as.

    (A) Tidal length
    (B) Tidal barrier
    (C) Tidal Range
    (D) Tidal period
    (E) Answer not known

89. OTEC system refers to

    (A) Ocean Tidal Energy Conversion
    (B) Ocean Technology for Energy Conversion
    (C) Ocean Technology for Energy Conservation
    (D) Ocean Thermal Energy Conversion
    (E) Answer not known

90. The global warming potential of methane is ————— time of carbondioxide

    (A) 0.21
    (B) 7.9
    (C) 79
    (D) 21
    (E) Answer not known

91. In bio ethanol production the substrate should be maintained ————— in pH level

    (A) Less than 3.0
    (B) Between 4 and 5
    (C) Between 6 and 9
    (D) Greater than 9
    (E) Answer not known

92. Which of the following thermo chemical conversion has high efficiency

    (A) Combustion   (B) Pyrolysis
    (C) Gasification   (D) Liquefaction
    (E) Answer not known

93. During anaerobic digestion of biomass organic material ————————
    organic acid is most abundantly produced.

    (A) Propionic acid   (B) Butyric
    (C) Formic   (D) Acetic
    (E) Answer not known

94. The total solid content of cowdung is

    (A) 80 – 82 %   (B) 18 – 20 %
    (C) 90 – 92 %   (D) 8 – 10 %
    (E) Answer not known

95. Identify the incorrect statement

    (A) Optimum temperature for biogas production is 30 – 35°C
    (B) Optimum pH for biogas production is 6 – 7
    (C) Optimum mixing ratio for biogas production is 1 : 1
    (D) Optimum CN ratio for biogas production is 1 : 30
    (E) Answer not known

96. Which of the following statements are true

    (i)   Wind speeds increase with height
    (ii) Kinetic energy of the wind is proportional to the cube of the wind
          speed
    (iii) Wind power is inversely proportional to the intercept area

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

97. Match the type of solar collector :
    (a) Line focusing 1. Paraboloidal type
    (b) Fresnel lens 2. Non focusing type
    (c) Point focusing 3. Refracting type
    (d) Compound parabolicy concentrator 4. Parabolic trough type

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

    (E) Answer not known

98. Which of the following is correctly matched.

    (i)   Cup anemometer   — Wind direction
    (ii) Ultra sound anemometer   — Wind speed and temperature
    (iii) Wind vane   — Wind speed and direction

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

99. The advantages of water as thermal energy storage

    (i)   High thermal storage capacity
    (ii) Useful material to store latent heat
    (iii) Inexpensive and readily available

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

100. Which of the following soil has highest erodibility?

(A) Sandy
(B) Peat Soil

(C) Clay soil
(D) Black cotton soil

(E) Answer not known

101. The practice of farming where water is not supplied for irrigation

(A) Dry farming
(B) Strip farming

(C) Garden land farming
(D) Cotton farming

(E) Answer not known

102. The transportation of soil particles by the surface creep action is referred to

(A) Finer soil particles
(B) Coarser soil particles

(C) Medium size soil particles
(D) Both (A) and (B)

(E) Answer not known

103. Tunneling effect is

(A) Gap in wind break
(B) Cracks in contour bund

(C) Mass transportation of soil
(D) Scouring in Bore well

(E) Answer not known

104. How many years of rain fall data is normally used for design of permanent gully control structures?

(A) 10 years
(B) 15 years

(C) 20 years
(D) 25 years

(E) Answer not known

105. Short length contour trenches are

    (A) Levelled trenches   (B) Graded trenches

    (C) Lined trenches   (D) Staggered trenches

    (E) Answer not known

106. According to Heed's recommendations, while designing a temporary gully control structure, the length of the downstream side apron should be ——————— the height of the structure if the slope of the gully bed is steeper than 8.5°.

    (A) 1.75 times   (B) 1.50 times

    (C) 1.25 times   (D) Equal to

    (E) Answer not known

107. Channels constructed across the slope for the purpose of intercepting surface runoff and conveying to a safe outlet

    (A) Irrigation channel   (B) Diversion drain

    (C) Field channel   (D) Contour drain

    (E) Answer not known

108. Bunds used in areas having rainfall more than 700 mm per year

    (A) Contour bund   (B) Graded bund

    (C) Compartmental bund   (D) Broad based bund

    (E) Answer not known

109. ——————— can be controlled by Vetiver.

    (A) Raindrop erosion   (B) Sheet erosion

    (C) Rill erosion   (D) Channel erosion

    (E) Answer not known

110. If the kinetic energy of raindrop is greater, the soil erosion is

(A) Less   (B) More

(C) Moderate   (D) Extreme

(E) Answer not known

111. The size of soil particles, susceptible to get detach by the collision of particles under saltation process is

(A) 0.05 to 0.5 mm   (B) 0.15 to 0.30 mm

(C) 0.25 to 0.35 mm   (D) 0.25 to 0.50 mm

(E) Answer not known

112. In air borne remote sensing, the successive photographs of terrain are taken in such a way that a —————— percent overlap in lateral direction of flight line

(A) 30   (B) 40

(C) 50   (D) 60

(E) Answer not known

113. Grass is a

(A) Analysis software   (B) Remote sensing tool

(C) GIS software   (D) Add-on package in Excel

(E) Answer not known

114. —————— remote sensing technique is used in watershed management, for crop assessment and yield prediction.

(A) Normalized differential vegetation index

(B) Soil assessment index

(C) Land use index

(D) Crop assessment index

(E) Answer not known

115. Water harvesting, primarily means

(A) Collection and preservation of rain water
(B) Harvesting water from drains
(C) Diverting water to rivers
(D) Removal of excess water from fields
(E) Answer not known

116. The groundwater recharge from recharge wells depends on

(A) Types of aquifer
(B) Specific capacity of well
(C) Well depth
(D) Geological formation
(E) Answer not known

117. Water entering the ground from a surface water source as a result of withdrawal of ground water adjacent to the source is called as

(A) Ground water recharge
(B) Surface recharge
(C) Subsurface recharge
(D) Induced recharge
(E) Answer not known

118. The method of in-situ water harvesting structure are

(A) Semi circular hoop
(B) Farm pond
(C) Percolation pond
(D) Check dam
(E) Answer not known

119. The day-to-day activities of a watershed development project are carried out by the

(A) Watershed development learn
(B) Watershed committee
(C) User group
(D) Self-help group
(E) Answer not known

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120. According to the All India soil and land use survey, in the watershed atlas of India, India is divided into —————— river basins

(A) 65

(B) 55

(C) 45

(D) 35 ✓

(E) Answer not known

121. Class VII land has a slope range of

(A) 8 – 15%

(B) 15 – 20%

(C) 18 – 25% ✓

(D) 12 – 18%

(E) Answer not known

122. Match the following :

(a) Shrinking and swelling dark clay soil   1. Oxisol

(b) Deep red soil with clay content   2. Vertisol

(c) Forest soils with clay subsurface horizon   3. Aridsol

(d) Soil for arid region not suitable for crop cultivation   4. Utisol

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

(E) Answer not known

123. The ratio between the cross-sectional area of flow and the wetted perimeter is called

   (A)   Hydraulic slope

   (B)   Hydraulic radius

   (C)   Free board

   (D)   Hydraulic length

   (E)   Answer not known

124. Choose the incorrect statement

   (i)   Lining the channels will eliminate water logging

   (ii)   Earthen channels should build with stable side slope

   (iii) In permeable soils like sand, sandy loam water may be as high as 20 to 40% of water delivered to the channel

   (iv)   Excessive gradients reduce the velocities of flow of water

   (A)   (i) and (ii)

   (B)   (iv)

   (C)   (ii) and (iv)

   (D)   (ii)

   (E)   Answer not known

125. The Apron in drop structure is used

   (A)   to dissipate the Hydraulic energy

   (B)   safe release of water

   (C)   to increase discharge of water

   (D)   both (A) and (B)

   (E)   Answer not known

126. ———————— poultry houses are most economical based on the initial investment as well as operational cost basis.

(A) Wire floor type   (B) Shallow litter type

(C) Deep litter type   (D) Cage house type

(E) Answer not known

127. Identify correct statement

(i) Floor area per cow for loose housing barn is lesser than stall barn

(ii) Cost of construction of loose housing barn is cheaper than stall barn

(iii) Cost of barn equipment for loose housing barn is cheaper than stall barn

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

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

(C) (ii) and (iii) are correct

(D) (i) is correct

(E) Answer not known

128. For an average size family of five members including two adults and three children, the septic tank capacity may be kept about

(A) 1.5 Cu.m.   (B) 2.8 Cu.m.

(C) 3.3 Cu.m.   (D) 3.8 Cu.m.

(E) Answer not known

129. The maximum length of the dairy barn should be restricted to ———————— m.

(A) 20   (B) 30

(C) 40   (D) 50

(E) Answer not known

130. Identify the incorrect statement :

    (i)   Combine harvester decreases the labour

    (ii)   Combine harvester saves the cost of harvesting and threshing the crops

    (iii) Possibility to get good profit in market by using combine harvester

    (iv)   Combine harvester requires less initial cost

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

131. As per BIS, the maximum combine losses for rice as

    (A) 1.0 %   (B) 1.5 %
    (C) 2.0 %   (D) 2.5 %
    (E) Answer not known

132. Repair and maintenance cost varies from ——————— of the initial cost of the machine per year

    (A) 5 to 10 %   (B) 20 to 25 %
    (C) 30 to 35 %   (D) 10 to 15 %
    (E) Answer not known

133. The straw racks in the straw walker of the combine harvester are oscillated at a speed of

    (A) 200 to 300 strokes per minute

    (B) 10 to 20 strokes per minute

    (C) 1500 to 1800 strokes per minute

    (D) 50 to 100 strokes per minute

    (E) Answer not known

134. In thresher the possible courses for broken grains.

   (1) High cylinder speed

   (2) Less concave clearance

   (3) Very Less M.C of crop

   (4) Over feeding

   (A) (1), (2) and (3) are correct

   (B) Only (1) and (2) are correct

   (C) Only (3) and (4) are correct

   (D) (1), (2) and (4) are correct

   (E) Answer not known

135. In seed drills, the shoe type furrow openers are more suitable for

   (A) Stony (or) Root Infested field

   (B) Poorly prepared bed (or) trashy soils

   (C) Considerable plant debris

   (D) Mulches soil

   (E) Answer not known

136. The equipment used to place seeds in holes at definite depth and spacing in seed bed is called as

   (A) Seed drill   (B) Drum seeder

   (C) Dibbler   (D) Gorru

   (E) Answer not known

137. This type of Harrows is fitted with PEGS as working Part, Fitted on a Rigid articulated or flexible frame.

   (A) Spike Tooth   (B) Spring Tooth

   (C) Bakhar   (D) Guntaka

   (E) Answer not known

138. Ploughing round a strip of unploughed Land is called as

(A) Casting Method   (B) Gathering Method

(C) Round and Round Method   (D) Continuous Method

(E) Answer not known

139. When a plough works round a strip of unploughed land is called

(A) Casting   (B) Gathering

(C) Carburizing   (D) Annealing

(E) Answer not known

140. Calculate the 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, the time lost in turning is 6%.

(A) 4 Hectares   (B) 0.4 Hectares

(C) 40 Hectares   (D) 0.04 Hectares

(E) Answer not known

141. Physiological changes to some types of fruits and vegetables caused by low temperatures which result in loss of eating quality is called as

(A) Shrinkage   (B) Loss in weight

(C) Chilling injury   (D) Spoilage

(E) Answer not known

142. The damage caused to the fruits when stored below 0°C. The affected fruit externally has an irregular shape caused by tissue collapse due to which the juice stream out from injured cut tissue even at slight pressure is termed as

(A) Chilling injury   (B) Carbon-dioxide injury

(C) Core flesh   (D) Freezing injury

(E) Answer not known

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143. The bin whose plane of rupture meets the opposite side before it emerges from the grain is called as ————————— bin.

(A) Shallow   (B) Deep

(C) Long   (D) Short

(E) Answer not known

144. The horse power requirement of screw conveyors of length(L) for horizontal operation with 'Q' as conveyer capacity for transporting material of bulk density 'W' is given by

(A) $(D^2 - d^2) \times p \times n$ (B) QLWF/4560

(C) QHF/4562   (D) $47.2(D^2 - d^2)$

(E) Answer not known

145. The overall efficiency of the pulses milling system can be estimated using ————————— formulae.

(A) Kick's   (B) Plank's

(C) Kupritz   (D) Bond's

(E) Answer not known

146. ————————— conveyor that operates between two pulley with its load supported in the idler.

(A) Belt conveyor   (B) Bucket conveyor

(C) Screw conveyor   (D) Pneumatic conveyor

(E) Answer not known

147. The air velocity in the range of ————————— is necessary for dispersion of bulk materials in pneumatic conveyor.

(A) 60-75 m/s   (B) 45-60 m/s

(C) 30-45 m/s   (D) 15-30 m/s

(E) Answer not known

148. One of the major advantages of using 'Rubber roll Sheller' over 'disc fuller' is

(A) Reduces the risk of grain breakage

(B) Simple in construction and operation

(C) Running cost is low

(D) Requirement of trained operator

(E) Answer not known

149. The important property to determine the heat transfer rates in solid agricultural product of any shape is

(A) Enthalpy

(B) Surface heat transfer coefficient

(C) Thermal diffusivity

(D) Convection

(E) Answer not known

150. The amount of moisture in a food at the end of the constant rate period of drying is

(A) Bound moisture

(B) Unbound moisture

(C) Free moisture

(D) Critical moisture content

(E) Answer not known

151. The thickness of grains in thin layer drying is normally upto

(A) 15 – 20 cm

(B) 20 – 25 cm

(C) 25 – 35 cm

(D) 35 – 40 cm

(E) Answer not known

152. The standard diameter of class a pan evaporimeter is

(A) 1250 mm   (B) 1210 mm

(C) 1150 mm   (D) 1225 mm

(E) Answer not known

153. A lamp at the top of a lighthouse is visible first above the horizon from a station at sea level. The distance of the lamp from the station is 30 km. Find the height of lighthouse.

(A) 60.57 m   (B) 60.57 km

(C) 6.057 m   (D) 6.057 km

(E) Answer not known

154. The sum of interior angles of a closed traverse is

(A) $(2n-4) \times 90°$ (B) $(2n+4) \times 90°$

(C) $(n-4) \times 90°$ (D) $(n+4) \times 90°$

(E) Answer not known

155. Irregular area may be computed by an instrument known as the

(A) Pentagraph   (B) Planimeter

(C) Passometer   (D) Clinometer

(E) Answer not known

156. The double mass curve technique is adopted to

(A) To find the average rainfall over a no. of years

(B) To find the number of rain gauges required

(C) Check the consistence of rain gauge records

(D) To estimate the missing rainfall data

(E) Answer not known

157. The term rainfall is used to describe precipitations in the form of water drops of sizes larger than

(A) 0.2 mm

(B) 0.3 mm

(C) 0.4 mm

(D) 0.5 mm

(E) Answer not known

158. The runoff from a drainage basin area 4320 km² is estimated as 10000 cumec-days. What is the depth of runoff?

(A) 20 cm

(B) 21.6 cm

(C) 40 cm

(D) 43.2 cm

(E) Answer not known

159. The height of water table in the field can be observed with the help of a

(A) Pumping well

(B) Observation well

(C) Artesian well

(D) Dried well

(E) Answer not known

160. A total station is

(A) A combination of an electronic theodolite and a tacheometer

(B) An electronic theodolite with levelling capabilities

(C) A digital theodolite combined with an EDM module

(D) A combination of an electronic theodolite and digital level

(E) Answer not known

161. It is a positioning method based on measurements to orbiting satellites

(A) GIS (B) GPS

(C) LIS (D) GTS

(E) Answer not known

162. The arrangement of mirrors in the ————— enables the observer to measure the angle between two different objects in single observation.

(A) Sextant (B) Hard level

(C) Clinometer (D) Pentagraph

(E) Answer not known

163. The constant vertical distance between two consecutive contour line is called

(A) Contour interval (B) Horizontal interval

(C) Vertical interval (D) Reduced level

(E) Answer not known

164. When a farm irrigation channel crosses a road, ridge, it is necessary to construct a

(A) A flumes (B) A chutes

(C) A culvert (D) Weirs

(E) Answer not known

165. The total area which can be irrigated by a certain channel or a project is called

    (A) Gross Command Area   (B) Net Command Area

    (C) Culturable Command Area   (D) Irrigation potential

    (E) Answer not known

166. Which of the following instrument is/are used to measure Evaporation?

    (i) USWB class-A Pan Evaporimeter

    (ii) Sunken Screen Pan Evaporimeter

    (iii) Piche Atmometer

    (A) (i) only

    (B) (i) and (ii) only

    (C) (ii) only

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

    (E) Answer not known

167. Sodium Absorption Ratio (SAR) is given by

    (A) $Na / \sqrt{Ca + Mg}$

    (B) $Na \Big/ \sqrt{\dfrac{Ca + Mg}{2}}$

    (C) $Na \Big/ \left(\dfrac{Ca + Mg}{2}\right)$

    (D) $Na \Big/ \dfrac{1}{2}\sqrt{Ca + Mg}$

    (E) Answer not known

168. Pressure compensating emitters refers to "——————".

 (A) Dissipate pressure and discharge a small uniform flow in emitter

 (B) Vortex effect to dissipate pressure in emitter

 (C) Discharge of water at a constant rate over a wide range of operating pressure

 (D) Long capillary fixed tube or channel to dissipate pressure

 (E) Answer not known

169. Calculate the farm conveyance efficiency when a stream of 95 l/s received at the farm gate after being diverted from a canal delivered 72 l/s to the field.

 (A) 23%   (B) 95%

 (C) 72%   (D) 76%

 (E) Answer not known

170. The size of a parshall flume is given by width of its

 (A) Throat   (B) Floor

 (C) Wall   (D) Converging section

 (E) Answer not known

171. Ratio of the volume of water discharged by the drains during a certain period to the precipitation generated in that period is

 (A) Drainable porosity   (B) Drainage gradient

 (C) Drainage coefficient   (D) Drainage efficiency

 (E) Answer not known

172. The drives operate at low power factor is

    (A) An induction motor direct online

    (B) AC regulator fed induction motor drivers

    (C) Induction motor drive with slip power recovery

    (D) All the above

    (E) Answer not known

173. A single phase induction motor employs ———————— rotor.

    (A) Squirrel cage   (B) Wound

    (C) Reduce losses   (D) Either squirrel cage or wound

    (E) Answer not known

174. The factors for lowering the tractive efficiency of tractor are

    (a) Rolling resistance

    (b) Slip

    (c) Diflexion

    (d) Traction

    (A) (a), (b) and (c) are correct

    (B) (b), (c) and (d) are correct

    (C) (c), (d) and (a) are correct

    (D) (d), (a) and (b) are correct

    (E) Answer not known

175. The size of the tyre, is 12.6" – 38". The value of 38" represent

    (A) Cross – sectional width of RIM

    (B) Height of the RIM

    (C) Diameter of the RIM

    (D) Circumference of the RIM

    (E) Answer not known

176. Clutch works on principle of

(A) Friction

(B) Gravity

(C) Traction

(D) Centrifugal force

(E) Answer not known

177. Match the fractions with the molecular composition of hydrocarbon content obtained by the fractional distillation of crude petroleum oil

(a) Petroleum gas

1. C_5 to C_{10}

(b) Gasoline or petrol

2. C_{13} to C_{16}

(c) Kerosene oil

3. C_1 to C_4

(d) Diesel oil

4. C_{10} to C_{12}

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

(E) Answer not known

178. As per ASAE standard, PTO speed of the tractor, when operating under load is

(A) 540 ± 10 rpm

(B) 540 ± 15 rpm

(C) 540 rpm

(D) 540 ± 20 rpm

(E) Answer not known

179. The compression ratio of four stroke cycle diesel engine usually varies from

(A) 14 : 1 to 22 : 1   (B) 6 : 1 to 8 : 1
(C) 10 : 1 to 12 : 1   (D) 8 : 1 to 10 : 1
(E) Answer not known

180. A mechanical device designed to control the speed of an engine within specified limit when the load is reduced or removed is

(A) Accelerator   (B) Governor
(C) Turbo charger   (D) Gearbox
(E) Answer not known

181. In SI engine, due to lower compression ratio the maximum value of that can be obtained is lower as

(A) Ignition   (B) Compression ratio
(C) Thermal efficiency   (D) Speed of engine
(E) Answer not known

182. For ideal auto cycle the events are assumed to be occurred in two strokes as follows

(a) The piston has zero friction in the cylinder
(b) Air is used in the cylinder as the working fluid
(c) The heat transfer takes place through engine valves
(d) All thermodynamic process are not assumed as ideal

(A) statement (a) and (b) are correct
(B) statement (a) and (c) are correct
(C) statement (b) and (c) are correct
(D) statement (c) and (d) are correct
(E) Answer not known

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183. Standardized milk contains standardized

    (A) 4.0 % fat and 8.0 % SNF

    (B) 4.5 % fat and 8.0 % SNF

    (C) 4.5 % fat and 8.5 % SNF

    (D) 4.0 % fat and 8.0 % Fat

    (E) Answer not known

184. The ability of the material to store electrical energy is known as

    (A) Dielectric loss factor

    (B) Loss tangent

    (C) Electrical conductivity

    (D) Dielectric constant

    (E) Answer not known

185. Rapid reversal of dipoles of water and some ionic compounds takes place
    in —————— heating.

    (A) Dielectric   (B) Ohmic

    (C) Irradiation   (D) Infra-red

    (E) Answer not known

186. In UHT system of pasteurization, milk is heated to 138°C for

    (A) 1 second   (B) 10 second

    (C) 1 minute   (D) 10 minutes

    (E) Answer not known

187. If Q_n is the net output, Q_d = drag flow, Q_p = pressure flow, Q_l = leakage flow, then the net output of an extruder is given by the expression.

    (A) $Q_n = Q_d + Q_p - Q_l$ (B) $Q_n = Q_d - Q_p + Q_l$

    (C) $Q_n = Q_d + Q_p + Q_l$ (D) $Q_n = Q_d - Q_p - Q_l$

    (E) Answer not known

188. An important control unit in any food pasteurization system is

    (A) Plate heat exchange   (B) Temperature indicator

    (C) Flow diversion value   (D) Holding tank

    (E) Answer not known

189. The critical speed (n_c) of the ball mill of radius 'R' with ball radius 'r' and 'g' as acceleration due to gravity is given by

    (A) $n_c = \sqrt{\dfrac{g}{R-r}}$ (B) $n_c = 2\pi\sqrt{\dfrac{g}{R-r}}$

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

    (E) Answer not known

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190. Fourier's law of heat conduction equation

(A) $q = kA\dfrac{dx}{dT}$

(B) $q = -kA\dfrac{dT}{dx}$ ✓

(C) $q = AdT$

(D) $q = kAdTdx$

(E) Answer not known

191. A phenomenon in which the rate of heat transfer and temperature in a system remains constant over time is referred as

(A) Steady state heat transfer ✓

(B) Unsteady state heat transfer

(C) Conduction heat transfer

(D) Convection heat transfer

(E) Answer not known

192. Amount of heat conducted per unit time through a unit thickness of the material if a unit temperature gradient exists across that thickness is known as

(A) Specific heat

(B) Thermal diffusivity

(C) Thermal conductivity ✓

(D) Enthalpy

(E) Answer not known

193. The fluids flow in the same direction through the equipment is called as

(A) Counter flow

(B) Cross flow

(C) Parallel flow ✓

(D) Mixed flow

(E) Answer not known

194. Arrange the following processes in sequence for ethanol production from biomass

1. Biomass preparation
2. Hydrolysis
3. Fermentation
4. Distillation

(A) 1, 2, 3, 4   (B) 1, 3, 4, 2
(C) 1, 2, 4, 3   (D) 1, 4, 2, 3
(E) Answer not known

195. Petrochemical conversion of biomass took place in two forms namely

(A) Gasification and liquefication
(B) Gasification and fermentation
(C) Liquefaction and fermentation
(D) Digestion and fermentation
(E) Answer not known

196. Identify the correct statement order of zones in down-draught gasifier from top to bottom.

(A) Drying, reduction, pyrolysis and oxidation
(B) Drying, pyrolysis, reduction and oxidation
(C) Drying, pyrolysis, oxidation and reduction
(D) Drying, reduction, oxidation and pyrolysis
(E) Answer not known

197. From biomass charcoal is produced through ——————— process.

(A) Gasification   (B) Pyrolysis
(C) Anaerobic obligation   (D) combustion
(E) Answer not known

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198. The purpose of controller in wind energy conversion system

(i)   To orient the rotor into wind

(ii)   For start up and cut–in of the equipment

(iii) To control the rotor power by varying the pitch of the blades

(iv)   Maintenance mode

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

199. The maximum theoretical power coefficient is equal to which cannot be exceeded by a rotor in a free – flow wind streams.

(A) $\dfrac{61}{72}$ (B) $\dfrac{72}{61}$

(C) $\dfrac{5}{8}$ (D) $\dfrac{16}{27}$

(E) Answer not known

200. The factors determine the output from a wind energy converter

(i)   Wind speed

(ii)   The cross section of wind swept by rotor

(iii) The overall conversion efficiency of conversion system

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

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