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Test Booklet Series

T. B. C. : AAE – 2/19

A**TEST BOOKLET****ASSISTANT AGRICULTURE ENGINEERS**Sl. No. **2389****PAPER – II****Time Allowed : 2 Hours****Maximum Marks : 100****: INSTRUCTIONS TO CANDIDATES :**

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5. This Test Booklet contains 100 items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose **ONLY ONE** response (answer) for each item (question).
6. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided by using **BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
7. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. **There will be no negative marking for wrong answer.**
8. Before you proceed to mark (darken) in the Answer Sheet the responses (answers) to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions sent to you with your **Admission Certificate**.
9. After you have completed filling in all your responses (answers) on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *Answer Sheet* issued to you. You are allowed to take with you the candidate's copy / second page of the Answer Sheet along with the **Test Booklet**, after completion of the examination, for your reference.
10. Sheets for rough work are appended in the Test Booklet at the end.

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1. Paddy need to be stored for larger period at an optimum moisture content of (in '%') :
 (A) 10
 (B) 12
 (C) 14
 (D) 20
2. Losses in case of fruits and vegetables generally varies from (in '%') :
 (A) 1 to 10
 (B) 10 to 30
 (C) 35 to 50
 (D) 50 to 60
3. Porosity of corn regardless of variety and moisture content, ranges from (in '%') :
 (A) 25.5 to 30.5
 (B) 31.6 to 37.6
 (C) 38.5 to 47.6
 (D) 47.9 to 52.4
4. Storage life of non-perishable fruits exceeds (in 'weeks') :
 (A) 6
 (B) 8
 (C) 10
 (D) 12
5. More careful controls of the quality of the finished product is permitted by :
 (A) Drier
 (B) Dehydrator
 (C) Evaporator
 (D) Homogenizer
6. For preparation of fruit squash for 1000 g of fruit juice the recommended sugar amount is (in 'g') :
 (A) 1000
 (B) 1200
 (C) 1500
 (D) 2000
7. The most important substance required for fruit jelly is :
 (A) Acid
 (B) Sugar
 (C) Pectin
 (D) Sucrose
8. While preparing fruit jam the end point temperature is kept as (in $^{\circ}\text{C}$) :
 (A) 100
 (B) 102.5
 (C) 105.3
 (D) 108.5

9. The maximum produced vegetable crop in India is :
(A) Onion
(B) Potato
(C) Okra
(D) Tomato
10. A grain sprouts only when its moisture content exceeds certain limit of moisture content of (in '%') :
(A) 30 to 35
(B) 10 to 15
(C) 5 to 10
(D) 40 to 50
11. In flat bed batch dryer air flow rate varies per 1000 kg of raw paddy (in 'm³/min') :
(A) 10 to 20
(B) 20 to 40
(C) 40 to 50
(D) 100 to 110
12. Unit operation which includes removal of heat is :
(A) Freezing
(B) Drying
(C) Fermentation
(D) Stabilization
13. Storage of food at very low temperatures is called as :
(A) Drying
(B) Cryogenics
(C) Size reduction
(D) Packaging
14. One of the key factors that influences blanching process is :
(A) Size of product
(B) Density
(C) Porosity
(D) Viscosity
15. Type of blanching in which pieces of produce are spread in a thin layer on a rapidly moving mesh belt passing through a steam chest is :
(A) Steam blanching
(B) Microwave blanching
(C) In-can blanching
(D) IQB
16. In cryogenic freezing of foods refrigerant used is :
(A) Freon
(B) Ammonia
(C) Liquid nitrogen
(D) Liquid helium

17. In inclined draper, the major factors to cause separation of grain are :
 - (A) Size and shape
 - (B) Shape and surface structure
 - (C) Shape and weight
 - (D) Weight and size
18. Parboiled bran contains oil of (in '%') :
 - (A) 22 to 25
 - (B) 30 to 45
 - (C) 10 to 15
 - (D) 20 to 28
19. In thin layer drying the thickness of grain bed is (in 'cm') :
 - (A) 14
 - (B) 20
 - (C) 10
 - (D) 12
20. Capacity of L. S. U. dryer varies from (in 'tonnes') :
 - (A) 2 to 12
 - (B) 15 to 20
 - (C) 1 to 5
 - (D) 25 to 35
21. In Bond's law work index is expressed in :
 - (A) cm
 - (B) kW/h
 - (C) m
 - (D) kJ/kg
22. Slope of the line drawn between the shear rate and shear stress is :
 - (A) Viscosity
 - (B) Fluidity
 - (C) Consistency
 - (D) Modulus
23. Energy absorbed by a material in a cycle of loading and unloading is called as :
 - (A) Mechanical hysteresis
 - (B) Dynamic angle of repose
 - (C) Resilience
 - (D) Viscosity
24. Rheology is well expressed by :
 - (A) Force and deformation alone
 - (B) Force alone
 - (C) Force, deformation and time
 - (D) Time and force alone

25. Flow, in which the solid flows towards outlet in a channel formed within solid itself is called as :
- (A) Mass flow
(B) Bulk flow
(C) Funnel flow
(D) Critical flow
26. Unit of thermal diffusivity is :
- (A) $\text{m}^2/\text{s} \cdot \text{kg}$
(B) m^2/s
(C) m^3/s
(D) m/s^2
27. Following is example for visco-elastic material :
- (A) Water
(B) Fruit Juice
(C) Wheat flour dough
(D) Alcohol
28. Work required to cause rupture in materials is called as :
- (A) Resilience
(B) Toughness
(C) Stiffness
(D) Rigidity
29. When a grain is heaped, radius of heap base is 10 cm and heap height is 10 cm, then the angle of repose of grain is :
- (A) 90°
(B) 30°
(C) 60°
(D) 45°
30. Terminal velocity of wheat grain is (in 'm/s') :
- (A) 20 to 30
(B) 30 to 40
(C) 9 to 11
(D) 60 to 70
31. In belt conveyors, the belt speed for grain conveying is in the range of (in 'm/s') :
- (A) 0.5 to 1.0
(B) 1.0 to 1.5
(C) 2.0 to 2.5
(D) 2.5 to 2.8
32. The trough angle for paddy and most other grains in belt conveyor is :
- (A) 20°
(B) 40°
(C) 45°
(D) 5°

33. The effective tension of belt in belt conveyor is expressed as (if P = Power and S = Speed) :
- S/P
 - $P \times S$
 - P/S
 - $P - S$
34. The magnitude of the centrifugal force in bucket elevator which is oriented outward is :
- WV^2/r
 - WV/r^2
 - $WV^2/g.r$
 - W^2V/r
35. The relation between pitch and diameter of screw is (P = Pitch and D = Diameter) :
- $P = D$
 - $P = 2D$
 - $P = 1.3 D$
 - $P = 0.4 D$
36. The average duration of a particle of water to pass through a phase of the hydrologic cycle :
- Residence time
 - Storage time
 - Runoff time
 - Retard time
37. Rainfall mainly affects the soil erosion by its property :
- Direction
 - Volume
 - Intensity
 - Depth
38. The base flow causes :
- Bank erosion
 - Rill erosion
 - Sheet erosion
 - Gully erosion
39. Drainage density is expressed in :
- sq-m
 - m^2/s
 - $m/sq.m$
 - m^3/m
40. In rational formula, time of concentration is used for computing :
- Rainfall intensity
 - Effective rainfall
 - Runoff coefficient
 - Direct runoff

41. Empirical formula for estimating the peak rate of runoff from large watersheds :
- (A) $Q = C \cdot A^{3/4}$
 (B) $Q = C^2 \cdot A^{1/2}$
 (C) $Q = \frac{C}{A^{1/2}}$
 (D) $Q = \sqrt{C \cdot A}$
42. In El_{30} , I_{30} stands for :
- (A) Rainfall intensity as 30 cm
 (B) Maxi. rainfall intensity for 30 min
 (C) Rainfall intensity at 30 min interval
 (D) Rainfall intensity at 30 s interval
43. Evapo-transpiration in a crop field surrounded by dry fallow land by vegetation due to :
- (A) Conduction of heat
 (B) Oasis effect
 (C) Clothes line effect
 (D) Convection of heat
44. If area of catchment is 10 km^2 and effective rainfall duration is 5 h, then the equilibrium discharge of S-curve Unit Hydrograph is (in ' m^3/h ') :
- (A) 4×10^2
 (B) 2×10^4
 (C) 2×10^2
 (D) 4×10^5
45. Low annual rainfall region in India receives rainfall :
- (A) 250-1000 mm
 (B) $> 1000 \text{ mm}$
 (C) $< 100 \text{ mm}$
 (D) $< 250 \text{ mm}$
46. What is soil erodibility if the percentage of sand, silt and clay as 50, 40 and 10 is :
- (A) 7
 (B) 8
 (C) 9
 (D) 10
47. The total flood prone area of India is estimated to be about (in 'million ha') :
- (A) 20
 (B) 30
 (C) 40
 (D) 50
48. The usual value of curve number for wetland paddy is :
- (A) 80
 (B) 85
 (C) 90
 (D) 95

49. The most important factor causing water erosion is :
- (A) Rainfall concentration
(B) Vegetative cover
(C) Topography
(D) Soil properties
50. When the velocity of overland flow is doubled its erosive capacity is increased :
- (A) Twice
(B) 4 times
(C) 6 times
(D) 32 times
51. The size of the soil particles prone to saltation ranges from :
- (A) 0.01-0.005 mm
(B) 0.05-0.5 mm
(C) 0.5-0.75 mm
(D) 0.75-1.0 mm
52. The minimum wind velocity at 30 cm height from the ground surface required to initiate of the soil particle (in 'kmph') :
- (A) 4
(B) 6
(C) 12
(D) 16
53. Land under different capabilities are classified into :
- (A) 2 groups
(B) 3 groups
(C) 4 groups
(D) 8 groups
54. The class III land consists slope :
- (A) 1-3 %
(B) 3-5 %
(C) 5-10 %
(D) 10-15 %
55. What is the vertical interval between bunds in a bench terrace if width of terrace is 4.5 m and land slope of 20% ?
- (A) 1.125 m
(B) 2.125 m
(C) 3.125 m
(D) 4.125 m
56. The most important soil property influencing the erodibility characteristic of soil as revealed from soil survey :
- (A) Permeability
(B) Infiltration
(C) Soil moisture
(D) Soil structure

57. The grass species deforming a vegetative barrier is usually a :
- (A) Soil building crop
(B) Soil binding crop
(C) Soil maintaining crop
(D) Soil depleting crop
58. The maximum longitudinal slope of a bench terrace is :
- (A) 0.25%
(B) 0.5%
(C) 0.75%
(D) 1%
59. To enable the movement of farm machinery, the side slope of vegetated waterways should not exceed :
- (A) 2 : 1
(B) 3 : 1
(C) 4 : 1
(D) 6 : 1
60. The All India Soil and Land Use Survey has delineated watershed maps for an area of :
- (A) > 50,000 ha
(B) 25,000 ha
(C) 10,000 ha
(D) 5,000 ha
61. In the construction of dug wells it is desirable to fill the space between the well curb and the sides of the excavation with :
- (A) Clay
(B) Sand
(C) Sand and gravel
(D) Broken stones or bricks
62. The diameter of tubewells for irrigation and water supply usually ranges from :
- (A) 15 to 45 cm
(B) 45 to 50 cm
(C) 50 to 55 cm
(D) 55 to 60 cm
63. The most common method of tube-well drilling in alluvial formations is :
- (A) Cable tool drilling
(B) Rotary drilling
(C) Reverse rotary drilling
(D) Down the hole drilling

64. An Archimedian screw is suitable to lift water from open bodies heights ranging from :
 (A) 0.5 to 1.2 m
 (B) 1.2 to 2.0 m
 (C) 2.0 to 3.0 m
 (D) 3.0 to 4.0 m
65. For pumping sewage water the most suitable type of impeller is :
 (A) -Open
 (B) Semi-open
 (C) Closed
 (D) Non-clog
66. Rational formula computes :
 (A) Runoff rate
 (B) Direct runoff
 (C) Peak runoff rate
 (D) Rainfall excess
67. Which of the following action causes soil erosion due to wave action ?
 (A) Attrition
 (B) Tunneling
 (C) Beating
 (D) Swelling
68. Splash erosion is associated with :
 (A) Rainfall intensity
 (B) Sheet flow
 (C) Wind velocity
 (D) Slope steepness
69. The V-shaped gullies are very common in :
 (A) Hilly areas
 (B) Desert regions
 (C) Level lands
 (D) Humid tropics
70. The fan shape watersheds are common in :
 (A) Plane areas
 (B) Hilly terrains
 (C) Humid regions
 (D) Arid zones
71. Which of the following watershed is classified based on the climate ?
 (A) Humid
 (B) Tribal settlement
 (C) Highland
 (D) Red soil
72. The shape of watershed is expressed by :
 (A) Shape index
 (B) Compactness coefficient
 (C) Bifereation ratio
 (D) Form factor

73. Which of the following parameter is used to evaluate the shape of basin ?
- (A) Form factor
(B) Circulatory ratio
(C) Elongation ratio
(D) Compactness coefficient
74. Commonly sprinkler irrigation method operates at a pressure of about (kg/cm^2) :
- (A) 0.5 to 10
(B) 1.5
(C) 0.1 to 0.5
(D) 0.5 to 100
75. The minimum wind speed required for the operation of a wind mill (kmph) :
- (A) 4-6
(B) 6-8
(C) 8-10
(D) 10-12
76. If 1 cm of water is added to ground water rise in ground water table will be (porosity 10%) :
- (A) 1.0 cm
(B) 10.0 cm
(C) 0.1 cm
(D) 20 cm
77. In the rational formula $Q = 0.0028$ E. I. A., I is the intensity of rainfall in :
- (A) mm/h
(B) cm/h
(C) m/h
(D) cm/min
78. The movement of soil particles having sizes in the range of 0.05 to 0.5 mm through a series of bounces is known as :
- (A) Surface creep
(B) Surface transportation
(C) Saltation
(D) Suspension
79. The side slopes of a cippoletti weir is :
- (A) 4 in 1
(B) 1 in 4
(C) 4 : 1
(D) 4%
80. Soil erosion is more in :
- (A) Sandy soils
(B) Silty soils
(C) Clay lawn
(D) Difficult to say

81. For a well, yield per unit of drawdown is known as :
- Specific capacity
 - Specific yield
 - Well yield
 - Safe yield
82. The time of concentration of a watershed is proportional to :
- $L^{1.77}$
 - $S^{-0.385}$
 - $L^{1.77} S^{-0.385}$
 - $S^{0.385}$
83. The difference between a shallow tubewell and a deep tubewell is on the basis of:
- Depth
 - Water task
 - Aquifer type
 - Aquifer depth
84. The available net positive suction head of a pump depends on :
- Suction lift
 - Friction loss
 - Vapour pressure
 - All of these
85. Computation of evapo-transpiration by Blancy-Cridde method is based on the principle of :
- Aerodynamics
 - Energy balance
 - Empirical approach
 - Combination of these
86. If the impeller speed of a centrifugal pump is doubled the power consumption will be:
- Same
 - Doubled
 - Four times
 - Eight times
87. A watershed of 1000 ha is discharged through a drain at an average rate of $2 \text{ m}^3/\text{s}$, then the drainage coefficient of the watershed is :
- 1.73 cm
 - 1.93 cm
 - 2.13 cm
 - 3.93 cm
88. The major water course of a 3 sq.km watershed has a fall of 25 m in 2.5 km. The time of concentration will be :
- 47.48 min
 - 51.35 min
 - 55.21 min
 - 59.23 min

89. Mole drains are suitable for :
- Very coarse soil
 - Medium coarse soil
 - Sandy loam soil
 - Fine texture soil
90. Hydraulically most efficient cross section of open channel is :
- Triangular
 - Rectangular
 - Semi-circular
 - Trapezoidal
91. Chute spillway is used to control drop of :
- 0-3 m
 - 1-4 m
 - 2-4 m
 - 3-6 m
92. The equation used to design a subsurface drainage system under steady state condition is :
- Krai Jenhoff equation
 - Glover-Dumm equation
 - Kirkham equation
 - Hamad equation
93. The mass per unit volume of a liquid at standard temperature and pressure is called :
- Specific weight
 - Specific gravity
 - Mass density
 - Unit density
94. The falling drops of water become sphere due to :
- Surface tension
 - Compressibility
 - Viscosity
 - Capillarity
95. The pressure measured with the help of a Piezo meter tube is :
- Atmospheric
 - Gauge pressure
 - Absolute pressure
 - Vacuum pressure
96. A flow in which the velocities of liquid particles at all sections of the pipe are equal is called :
- Uniform flow
 - Streamline flow
 - Steady flow
 - Compressible flow

97. A venturimeter is used to measure :

- (A) Velocity of a flowing liquid
- (B) Pressure of a flowing liquid
- (C) Discharge of a flowing liquid
- (D) Weight of a flowing liquid

(B) $\frac{d}{3}$

(C) $\frac{d}{4}$

(D) $\frac{d}{6}$

98. The ratio of loss of head at entrance to that at the exit of pipe is :

- (A) 0.375
- (B) 0.4
- (C) 0.5
- (D) 0.855

100. The total energy line lies over the hydraulic gradient line by an amount equal to :

(A) $\frac{v^2}{2g}$

(B) $\frac{v^2}{g}$

(C) $\frac{v}{2g}$

(D) $\frac{v}{g}$

99. The hydraulic mean depth for a circular pipe of diameter, d is :

(A) $\frac{d}{2}$

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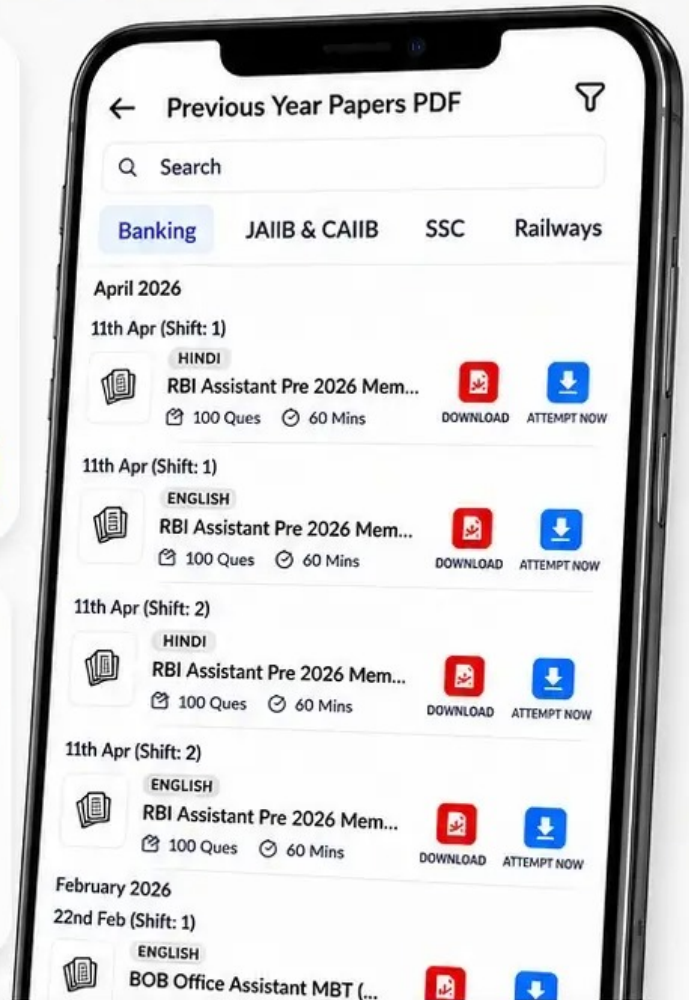
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