

PART III

09 – AGRICULTURAL AND IRRIGATION ENGINEERING

(Answer ALL questions)

56. In a flange coupling, the flanges are coupled together by means of
- bolts and nuts
 - studs
 - headless taper bolts
 - none of these
57. A man can develop
- 0.1 hp
 - 0.5 hp
 - 0.75 hp
 - 1.0 hp
58. Carburettor is the main part of
- Diesel engine
 - Petrol engine
 - Gas engine
 - Steam engine
59. National arid zone research institute is located in
- New Delhi
 - Jaipur
 - Jodhpur
 - Ahmedabad
60. In arid zones afforestation provides a mechanical obstacle to the free sweep of wind, reducing in the process
- Wind velocity
 - Soil erosion
 - Evaporation from soil
 - All of the above
61. Sediment deposit in reservoirs can be reduced by
- Avoiding reservoir sites which are prolific sources of sediment
 - Adopting soil conservation measures in the catchment area
 - Providing vegetative cover
 - All of the above
62. Which of the following statement is false?
- The specific yield of an aquifer may be more than its porosity
 - Flow in a medium sand aquifer is entirely laminar
 - Plants usually extract water from the capillary zone
 - Storage co-efficient is the same as specific yield for a water table aquifer.
63. In India, the variability of rainfall is least in
- Zones of high rainfall
 - Zones of low rainfall
 - Coastal areas
 - Hilly areas
64. When the dynamic viscosity of a fluid is 0.6 poise and specific gravity is 0.6, the kinematic viscosity of that fluid will be
- 0.36 poise
 - 0.6 poise
 - 1 poise
 - None of the above
65. The separation of flow occurs
- Due to reduction of pressure gradient to zero
 - Due to reduction of pressure gradient to negligibly low value
 - Under an adverse pressure gradient
 - When the hydrodynamic boundary layer thickness is reduced to zero
66. The viscosity of a fluid with specific gravity 1.3 is measured to be 0.0034 Ns/m². Its kinematic viscosity in m²/s is
- 2.6×10^{-6}
 - 4.4×10^{-6}
 - 5.8×10^{-6}
 - 7.2×10^{-6}

67. Viscosity has dimensions of

- a. $\frac{FT^2}{F}$
- b. $\frac{F}{TL^2}$
- c. $\frac{M}{LT^2}$
- d. $\frac{M}{LT}$

68. The head loss in a pipe flow can be calculated by using

- a. The Bernoulli equation
- b. Darcy's law
- c. The Chezy Manning equation
- d. The Darcy Weisbach equation

69. Which one of the following soils may be expected to have higher percentage of silt?

- a. Clay
- b. Sand clay
- c. Sand
- d. Silty clay loam

70. A fibrous mass of organic matter in various stages of decomposition generally dark brown to black in colour and of spongy consistency, is known as

- a. Murrum
- b. Peat
- c. Black expansive soil
- d. Back fill

71. When water content in a soil is reduced beyond the shrinkage limit, the soil will be in

- a. Solid state
- b. Liquid state
- c. Semi solid state
- d. Plastic state

72. Which soil remains at the place of integration of parent rock?

- a. Residual soil
- b. Lacustrine soil
- c. Aeolian soil
- d. Alluvial soil

73. The uniformity coefficient of soil is

- a. $\frac{D60}{D10}$
- b. $\frac{D30}{D10}$
- c. $\frac{D60}{D30}$
- d. $\frac{D60}{D30 \times D10}$

74. The ratio of volume of irrigation water stored in the root zone and available for plant use to the volume delivered from irrigation system is called

- a. Irrigation water use efficiency
- b. Water conveyance efficiency
- c. Water use efficiency
- d. Irrigation application efficiency

75. The appearance of 'yellow colour' in soil is due to presence of

- a. Hematite
- b. Silicates
- c. Limonite
- d. Quartz

76. Which soil water is not available for plant growth?

- a. Capillary water
- b. Gravitational water
- c. Hygroscopic water
- d. Perched water

77. The irrigation method suitable for cotton potatoes etc is

- a. Border strip method
- b. Furrow method
- c. Basin method
- d. All of them

78. Maximum water application efficiency is in
- Surface irrigation
 - Lift irrigation
 - Sprinkler irrigation
 - Furrow irrigation
79. The ratio of total volume of water delivered to a crop to the area on which it has been spread is called
- Critical depth
 - Duty
 - Delta
 - Crop water depth
80. A cross drainage work which carries a canal over a channel without lowering the bed level of the channel is called
- Aqueduct
 - Hybrid channel
 - Super passage
 - Siphon
81. The weed growth in canal
- Reduces silting
 - Reduces discharge through the canal
 - Increases the velocity of flow
 - Increases the contamination of water
82. Evapo-transpiration is
- Water equivalent to moisture contained in air which is lost through evaporation
 - Unaccounted loss of water by evaporation at a location
 - Evaporation from plants in a catchment area
 - The total evaporation and transpiration from the catchment area
83. _____ is used to find the water activity of a heterogeneous mixture of food
- Salwin Slawson equation
 - BET isotherm equation
 - GAB isotherm equation
 - Rault's law
84. Gasification of biomass is a
- Biochemical conversion process
 - Thermo chemical conversion process
 - Hydro chemical conversion process
 - Geochemical conversion process
85. The value of solar constant is approximately _____ kW/m^2
- 3.64
 - 10
 - 1.36
 - 6.5
86. Wellner – Jelliner method is adopted in
- Freezer
 - Evaporator
 - Separator
 - Mixer and blender
87. Quantitative Microbial Risk Analysis
- Analyses health risks associated with contaminated drinking water
 - Analyses environmental flow
 - Analyses river water
 - Analyses health risks associated with wastewater use in agriculture
88. The specific heat of a grain at 12% m.c. wb whose specific heat at absolute dry condition is 0.42 will be _____ $\text{kcal / kg } ^\circ\text{C}$
- 0.472
 - 0.372
 - 0.572
 - 0.742
89. Gable type is a _____ that is more suitable for rainfall areas
- Hog house
 - Stanchion barn
 - Poultry house
 - Fish pond
90. 100 kg of milk with 7.5% fat content was fed into a cream separator and the cream obtained was 14.1 kg with 52.5% fat. The skimming efficiency of the cream separator is
- 78.9%
 - 87.9%
 - 97.8%
 - 98.7%

91. Milk obtained by adding water, skimmed milk powder to the whole milk to get 3% fat and 8.5% SNF is called
- Homogenized milk
 - Toned milk
 - Standardized milk
 - Reconstituted milk
92. The unit draft when a pair of bullocks pulls a plough with 85 kg draft at 3 kmph to make a furrow of 20 cm wide and 11 cm deep will be
- 0.863 ksc
 - 0.944 ksc
 - 0.386 ksc
 - 0.386 psi
93. The ratio of Effective field capacity to Theoretical field capacity is called
- Machine efficiency
 - Field efficiency
 - Custom efficiency
 - Mechanical efficiency
94. The total draft required for a plough is measured by
- Dynamometer
 - Chartometer
 - Speedometer
 - Pyrometer
95. In a tyre size of 10 x 38, 10 represents
- Cross-sectional diameter in inches
 - Rim diameter in inches
 - Pressure of tyre in psi
 - Pressure of tyre in ksc
96. A fan running at a speed of 473 rpm and delivering 14850 cub ft /min requires 3.18 HP. If the fan is to run at 537 rpm and deliver 16850 cub ft / min, the HP required is
- 6.45
 - 4.65
 - 4.56
 - 5.64
97. The angles of intersection of two plane mirrors of an optical square is
- 15°
 - 22.5°
 - 30°
 - 45°
98. Hour system is mostly used in
- Geological survey
 - Astronomy
 - Navigation
 - (b) and (c) above
99. The total depth of irrigation to crop
- Delta
 - Base
 - Intensity of irrigation
 - None of the above
100. The volume of water discharged per unit of time from the well is called
- Capacity of well
 - Well yield
 - Well stock
 - None of the above
101. Which of the following is low volume sprayer?
- Gear type rotary pump
 - Roller vane rotary pump
 - Plunger pump
 - All of the above
102. Which of the following statements is correct regarding transpiration?
- It creates suction force and help in the ascent of sap
 - It affects the diffusion pressure deficit
 - It maintains the temperature for the leaves
 - All of the above
103. Which one is used for primary tillage?
- Hand hoe
 - Deshi plough
 - Mould board plough
 - Blade harrow

104. The single cylinder engine is generally used in
- Tractor
 - Stationery tillage
 - Motor cars
 - Power tiller engine
105. Junker's calorimeter is used for determining the calorific value of
- Liquid fuels
 - Solid fuels
 - Gaseous fuels
 - None of the above
106. Detonation refers to the
- Engine Knocking
 - Engine speed
 - Engine efficiency
 - None of the above
107. In tractor engines, a commonly used thermostat valve is
- Bimetallic type
 - Bellows type
 - Both (a) and (b) type
 - None of the above
108. A mould board plough which is suitable for ploughing along hillsides is
- One-way plough
 - Two way plough
 - Both (a) and (b) above
 - Three way plough
109. An undisturbed soil surface of a furrow is
- Furrow slice
 - Furrow wall
 - Furrow crown
 - Furrow back
110. Sweeps are used for
- Seedbed preparation
 - Ridging
 - Earthing plants
 - Mulching
111. In power operated sprayer, the pump works at a pressure of
- 2-5 kg/cm²
 - 3-8.5 kg/cm²
 - 4-12 kg/cm²
 - 5-15 kg/cm²
112. The operating speed of combine harvester varies within a range of
- 600-800 rpm
 - 900-1000 rpm
 - 600-1400 rpm
 - Above 1500 rpm
113. Gully erosion is the advance stage of
- Splash erosion
 - Sheet erosion
 - Rill erosion
 - All are correct
114. Grassed waterways are used as
- Diversion channels
 - Outlets
 - Inlet to terrace system
 - Inlet
115. Present tractor population in India is around
- 1 million
 - 1.5 million
 - 2.5 million
 - More than 3.5 million