

APPSC - Assistant Executive Engineers (AEE) Screening Test - 2016

Question Paper & Key to Sections II & III of Agricultural Engineering

Held on: 06-11-2016

Section – II – Agricultural Engineering

1. The velocity of a fluid in a pipe of diameter D is V. The pipe is connected to another pipe of diameter 2D. Reynolds number in the pipe of diameter D in relation to the pipe of diameter 2D is :
 - 1) Double
 - 2) Four times
 - 3) Half
 - 4) Same
2. The part of a refrigeration unit in which the refrigerant changes from vapour to liquid is called:
 - 1) Evaporator
 - 2) compressor
 - 3) condenser
 - 4) throttle valve
3. Psychrometric chart is a graphical representation of which properties of air:
 - 1) Chemical
 - 2) Aerodynamic
 - 3) Hygroscopic
 - 4) Thermodynamic
4. Logarithmic mean radius of a pipe in relation to its arithmetic mean radius is always:
 - 1) Smaller
 - 2) Greater
 - 3) Equal or smaller
 - 4) Equal or greater
5. At air 40⁰ C and 50% rh has a wet bulb depression of 10⁰ C. If the relative humidity decreases to 40%, the wet bulb depression will :
 - 1) increase
 - 2) decrease
 - 3) remain constant
 - 4) follow no definite trend
6. Regeneraton is economical when product is
 - 1) Heated
 - 2) Cooled
 - 3) Heated and cooled
 - 4) None of the above
7. The dimensions of thermal diffusivity are:
 - 1) MLT^{-2}
 - 2) M^0LT
 - 3) $M^{-1}LT$
 - 4) None of the above
8. Freezing temperature of brine is :
 - 1) Lower than pure water
 - 2) Higher than pure water
 - 3) same
 - 4) None of the Above
9. Which of the following mineral particle size (s) is classified as silt according to ISSS:
 - 1) 0.05 to 0.1 mm
 - 2) 0.002 to 0.05 mm
 - 3) 0.002 to 0.02 mm
 - 4) None of the above
10. Maize is a :
 - 1) Soil maintaining crop
 - 2) Soil building crop
 - 3) Soil depleting crop
 - 4) None of the above

11. Class IV type lands are :

- 1) Suitable for cultivation
- 2) Not suitable for cultivation
- 3) Partly suitable for cultivation
- 4) None of the above

12. Length of the surveyor's chain is

- 1) 33 ft.
- 2) 66 ft.
- 3) 100 ft.
- 4) 150 ft.

13. Soil degradation takes place due to:

- 1) Glacial erosion
- 2) Geologic erosion
- 3) Accelerated erosion
- 4) All of the above

14. Darcy's Law is valid for :

- 1) Laminar and turbulent flow
- 2) Turbulent flow
- 3) Laminar flow
- 4) Transient flow

15. A refrigerant vapour is to be condensed inside a shell and tube heat exchanger using water as the cooling medium. The water should flow through

- 1) Shell side of the heat exchanger
- 2) Tube side of the heat exchanger
- 3) Any of 1) and 2) above
- 4) None of the above

16. Fluid which become more fluid viscosity decreases with time as they are stirred are known as

- 1) Pseudoplastic
- 2) Dilatant
- 3) Thixotropic
- 4) Rheopectle

17. Sun's radiation corresponding to that of a black body temperature is about

- 1) 5000°K
- 2) 6000°K
- 3) 7000°K
- 4) 14000°K

18. In a heat exchanger, the rate of heat transfer from the hot fluid to the cold fluid

- 1) Varies as square of the area
- 2) Varies directly as the area and its LMTD
- 3) Directly proportional to LMTD and inversely as the area
- 4) none of the above

19. Slump test is used for measurement of

- 1) Hardness of concrete
- 2) plasticity of concrete
- 3) Elasticity of concrete
- 4) all of the above

20. Natural convection is associated with:

- 1) Prandtl number only
- 2) Reynolds number only
- 3) Grashof number only
- 4) Nusselt number only

21. The ratio of water stored in the root zone of the plants to water delivered to the field is termed as

- 1) Water application efficiency
- 2) Water storage efficiency
- 3) Water distribution efficiency
- 4) Water use efficiency

22. The ratio of the volume of voids to the total soil volume is called

- 1) Void ratio
- 2) Porosity
- 3) Dry bulk density
- 4) Wet bulk density

23. Penman method is used to compute

- 1) Consumptive use of crops
- 2) Potential evapotranspiration of crops
- 3) Water requirement of crops
- 4) Irrigation water requirement of crops

24. Most cereal foods contain mainly

- 1) Protein
- 2) Fat
- 3) Starch
- 4) Vitamins

25. Quicksand condition is created due to

- 1) frictionless nature of soil
- 2) low value of cohesion of soil
- 3) upward seepage force greater than submerged weight of soil
- 4) downward seepage pressure

26. At field capacity, soil moisture tension of sandy soil is approximately equal to

- 1) 0.1 bar
- 2) 1.0 bar
- 3) 10 bar
- 4) none of the above

27. One ton of refrigeration is equivalent to the heat required to melt one tonne of ice in

- 1) 6h
- 2) 12 h
- 3) 18 h
- 4) 24 h

28. Evapotranspiration in a crop field surrounded by dry fallow land will be higher than that surrounded by vegetation due to

- 1) conduction of heat 2) oasis effect 3) clothesline effect 4) convection of heat

29. For a watershed, the universal soil-loss equation computes

- 1) annual runoff 2) average annual soil loss 3) erodibility factor 4) average annual rainfall

30. The porosity of sandy soil usually ranges from

- 1) 30 to 35% 2) 35 to 50% 3) 40 to 60% 4) 50 to 60%

31. The indicator plant used for determining the permanent wilting percentage

- 1) Wheat b) Safflower c) Sunflower d) Paddy

32. When the soil moisture and rainfall are inadequate during the growing season to support healthy crop growth to maturity is called

- 1) Metrological drought b) Hydrological drought c) Agricultural drought d) None of these

33. Soil strength is determined by :

- 1) Penetrometer 2) Micrometer 3) Hydrometer 4) Dynamometer

34. Lysimeter is used to measure

- 1) Infiltration 2) Evaporation 3) Evapotranspiration 4) Vapour pressure

35. The dominant cation in most of the soils is

- 1) Sodium 2) Potassium 3) Calcium 4) Magnesium

36. The element responsible for dispersion of particles in soils is

- 1) Manganese 2) Potassium 3) Sodium 4) Calcium

37. The relative mobility of this ion is least in soil system

- 1) Magnesium 2) Silicon 3) Aluminum 4) Iron

38. This is an abundant group of rocks on the surface of the earth crust

- 1) Igneous 2) Sedimentary 3) Metamorphic 4) Organic

39. The mechanically formed sedimentary rock is

- 1) Bauxite 2) Sand stone 3) Halite 4) Graphite

40. This is an accessory mineral

- 1) Microcline 2) Biotite 3) Quartz 4) Magnetite

41. This soil structure is common in sub-surface of alkali soils

- 1) Spheroidal 2) Blocky 3) Crumby 4) Columnar

42. The net negative charge of colloidal complex is more at pH

- 1) 3.0-5.0 b) 5.0-6.5 c) 7.0-8.0 d) Not changed with pH

43. The chemical reaction involved in nitrogen fixation is

- 1) Oxidation 2) Deamination 3) Nitrification 4) Reduction

44. Laterite soils belong to the order

- 1) Alfisols 2) Oxisols 3) Spodosols 4) Inceptisols

45. Atterberg's limits are related to the soil property

- 1) Structure 2) Plasticity 3) Density 4) Strength

46. The dominant soil order in India

- 1) Vertisols 2) Alfisols 3) Entisols 4) Inceptisols

47. The clay enriched sub-surface horizon is called

- 1) Albic 2) Argillic 3) Cambic 4) Oxic

48. This textural class is comparatively coarser

- 1) Silty clay loam 2) Silty loam 3) Sandy clay 4) Silty clay

49. Internal drainage is the common problem in these soils

- 1) Deltaic alluvium 2) Coastal sands 3) Black cotton soils 4) Red loam soils

50. Bulk density is likely to be less in these soils

- 1) Organic 2) Red 3) Sandy 4) Black

Section – II – Agricultural Engineering - Key

1-10:	1, 3, 4, 1, 1, 3, 4, 1, 3, 3
11-20:	3, 2, 3, 3, 2, 3, 2, 2, 2, 3
21-30:	1, 2, 2, 3, 3, 1, 4, 2, 2, 2
31-40:	3, 3, 1, 3, 3, 3, 3, 2, 2, 4
41-50:	4, 3, 4, 2, 2, 4, 2, 2, 1, 1

Section – III – Agricultural Engineering

1. The discharge rate of drip emitters usually ranges from :

- 1) 2-10 liters/day 2) 2-10 liters/hr 3) 2-10 liters/min 4) 2-10 liters/sec

2. Sprinkler irrigation is recommended in :

- 1) Highly undulating area
2) Soils having high infiltration rate
3) Irrigation source is a tube well
4) In all the above situations

3. The soil property for good ground water yield is :

- 1) Porosity 2) Effective size > 0.1 mm
3) Uniformity coefficient > 3 4) Uniformity coefficient < 2

4. Vertical interval (VI) of bench terrace for a vertical cut is given as :

- 1) (100S)/W 2) (100S)/S 3) (100/(WS)) 4) (WS/100)

5. Mole drains are suitable for
- 1) Very coarse soil 2) Medium coarse soil 3) Sandy loam soil 4) Fine texture soil
6. Hydraulically most efficient cross-section of an open channel is
- 1) Triangular 2) Rectangular 3) Semi-circular 4) Trapezoidal
7. Sediment yield is the
- 1) Total soil loss from an area 2) Product of gross erosion and delivery ration
3) Both 1) and 2) 4) None of the above
8. Chute spillway is used in control a drop of
- 1) 0-3 m 2) 1-4 m 3) 2-4 m 4) 3-6 m
9. Soil loss in geologic erosion is
- 1) Less than accelerated erosion 2) Greater than accelerated erosion
3) Medium 4). None of the above
10. Self priming centrifugal pump has impellor of following type
- 1) Backward curved vane impeller 2) Radial vane impeller
3) Forward curved vane impeller 4) Combination of radial and forward curved vane impeller.
11. Toe-in and toe-out are related with
- 1) Front axle of tractor b) Rear axle of tractor c) Tractor steering d) Transmission system
12. In the Rational formula $Q = 0.0028 C.I.A.$, I is the intensity of rainfall in
- 1) mm per hour 2) cm per hour 3) m per hour 4) cm per minute
13. Separation of liquids from solids by the application of pressure is known as:
- 1) Extraction 2) Expression 3) Filtration 4) Leaching.
14. In size reduction of fine powders, which of the following laws is more applicable:
- 1) Kick' Law 2) Rittinger's Law 3) Bond's Law 4) All of the above

15. The percentage of bran received from paddy:
- 1) 5 2) 10 3) 15 4) 20
16. Increasing the cylinder speed results in
- 1) Increase the threshing efficiency 2) Reduce cylinder loss
3) Increase seed damage 4) All of the above
17. In a rubber roll paddy sheller, the direction or rotation and peripheral speeds of the Rollers are respectively
- 1) Same and equal 2) Same and different
3) Opposite and equal 4) Opposite and different
18. In dry milling process of pulses, prior to treatment with oil, the following operation is Done
- 1) Conditioning 2) Grading 3) Pitting 4) scalping
19. In case of intermittent drying, total drying time reduces as exposure time
- 1) Increases 2) Decreases 3) No effect 4) None of the above.
20. Generally temperature in multiple effect evaporators will___in subsequent effects
- 1) Decrease 2) Increase 3) remains constant 4) None of the above
21. Theoretically number of ways to increase cyclone efficiency when particle size reduces from 10 micron to 5 micron diameter are
- 1) By increasing entrance velocity 2) By increasing length of cyclone
3) Temperature in the cyclone 4) 1 and 2
22. Milk and fruit juice are deaerated before they are allowed to flow through pasteurizer. This is done in order to:
- 1) reduce fouling of pasteurizer 2) increase rate of heat transfer
3) reduce oxidative deterioration 4) reduce microbial load
23. Thermal vapour compression is used in
- 1) Evaporator 2) Homogenizer 3) Pasteurizer 4) None of the above
24. The specific gravity of skim milk is
- 1) lower than whole milk 2) same as whole milk
3) higher than whole milk 4) same as water

25. Centrifugal discharge is used in
- 1) belt conveyor 2) chain conveyor 3) screw (auger) conveyor 4) bucket elevator
26. The removal of few large particles in an initial process is
- 1) Scalping 2) Cleaning 3) Grading 4) Sorting
27. Disc separator separates materials on the basis of
- 1) Length 2) Width 3) Weight 4) Shape
28. For biological materials, the relationship between EMC and RH was given by
- 1) Janssen 2) Rankine 3) Henderson 4) Chung Fast
29. In ball mill, the size of food grains is reduced due to
- 1) Crushing 2) Shearing 3) Impact 4) All of the above
30. In a godown extra space for alleyways for inspection and disinfection of stacks is provided which is generally about
- 1) 30 % 2) 20 % 3) 5 % 4) 1 %
31. In stanchion barn, the cows are housed and milked in
- 1) Different building 2) open space 3) same buildings 4) None of the above
32. In deep litter poultry house, the depth of litter in centimeters should be
- 1) 15-20 2) 20-25 3) 10-15 4) 30-40
33. Herring bone is a
- 1) Milking parlour 2) fencing 3) barn 4) All of the above
34. The velocity required to operate a wind mill is more than
- 1) 5 KMPH 2) 10 KMPH 3) 5 miles per hour 4) 10 miles per hour
35. Main constituent of biogas is
- 1) Methane 2) Ethane 3) Butane 4) Carbon dioxide

36. In floating type biogas plant, the gasholder is made of
- 1) Metal 2) Wood 3) Cement and Bricks 4) All of the above
37. The gas production per unit volume of digester capacity will be maximum when the diameter to depth ratio of digester will be in the range of
- 1) 0.66 to 1.00 2) 0.75 to 1.20 3) 0.85 to 1.30 4) 0.90 to 1.40
38. The wet process of biomass digestion involve
- 1) Pyrolysis and Gasification 2) Hydrogenation and liquefaction
3) Liquefaction and Pyrolysis 4) Anaerobic digestion and fermentation
39. Tilt angle in a disc plough varies from:
- 1) 5-10 deg. 2) 10-15 deg 3) 15-25 deg. 4) 25-30 deg.
40. Increasing length of land side of a one bottom right hand mould board plow will:
- 1) Increase the amount of offset on the tractor
2) Decrease the amount of offset
3) No affect
4) None of the above
41. Disc type furrow openers are especially suited to
- 1) Stony and root infested soils
2) Poorly prepared bed in trashy soils
3) Hard and sticky ground with considerable amount of debris and mulch
4) All of the above
42. A power tiller is most suited for rotary cultivation because
- 1).It generates negative draft
2).Its traction requirement is low
3).It provides high degree of soil pulverization
4).All of the above
43. The most used and least efficient power outlet of a tractor is
- 1) Power take-off shaft in the front 2) Drawbar in the rear
3) P.T.O. in the rear 4) None of the above
44. If the travel speed of a tillage tool is increased. The draft will
- 1) Increase linearly 2) Decrease linearly
3) Increase quadratically 4) Decrease quadratically

45. The penetration of animal-drawn disc harrows can be increased by:
- 1) increasing the disc angle
 - 2) decreasing the tilt angle
 - 3) adding more dead weight
 - 4) All of the above
46. The use of a pressurized radiator cap in forced-circulation water cooling system in tractor engines helps in
- 1) reducing the evaporation losses
 - 2) increasing the engine-operating temperature
 - 3) increasing the boiling temperature of water
 - 4) increasing the radiator-cooling capacity
47. The common type of fertilizer metering mechanism used on animal-drawn seed cum fertilizer drills is
- 1) star-wheel feed
 - 2) Auger
 - 3) Stationary opening
 - 4) Edge cell vertical rotor
48. The firing order of 4 stroke 4cylinder engine is
- 1) 1-3-2-4
 - 2) 1-3-4-2
 - 3) 1-4-3-2
 - 4) 1-2-3-4
49. Angle between centre line of kingpin of tractor and vertical line is called
- 1) Tilt angle
 - 2) Camber Angle
 - 3) Caster angle
 - 4) All of the above
50. Joints and coulters are the parts of
- 1) Disc plough
 - 2) Harrow plough
 - 3) Indigenous plough
 - 4) MB plough

Section – III – Agricultural Engineering - Key

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