महाराष्ट्र कृषी सेवा मुख्य परीक्षा, 2011

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प्रश्नपुस्तिका क्रमांक
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प्रश्नपुस्तिका
कृषि अभियांत्रिकी

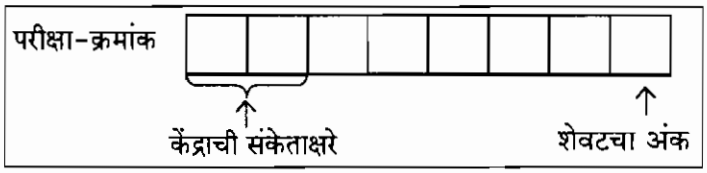
वेळ : 2 (दोन) तास

एकूण प्रश्न : 200
एकूण गुण : 400

सूचना

(1) सदर प्रश्नपुस्तिकेत 200 अनिवार्य प्रश्न आहेत. उमेदवारांनी प्रश्नांची उत्तरे लिहिण्यास सुरुवात करण्यापूर्वी या प्रश्नपुस्तिकेत सर्व प्रश्न आहेत किंवा नाहीत याची खात्री करून घ्यावी. असा तसेच अन्य काही दोष आढळल्यास ही प्रश्नपुस्तिका समवेक्षकांकडून लगेच बदलून घ्यावी.

(2) आपला परीक्षा-क्रमांक ह्या चौकोनांत **न विसरता बॉलपेनने** लिहावा.



(3) वर छापलेला प्रश्नपुस्तिका क्रमांक तुमच्या उत्तरपत्रिकेवर विशिष्ट जागी उत्तरपत्रिकेवरील सूचनेप्रमाणे **न विसरता नमूद करावा.**

(4) या प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाला 4 पर्यायी उत्तरे सुचविली असून त्यांना 1, 2, 3 आणि 4 असे क्रमांक दिलेले आहेत. त्या चार उत्तरांपैकी सर्वात योग्य उत्तराचा क्रमांक उत्तरपत्रिकेवरील सूचनेप्रमाणे तुमच्या उत्तरपत्रिकेवर नमूद करावा. अशा प्रकारे उत्तरपत्रिकेवर उत्तरक्रमांक नमूद करताना तो संबंधित प्रश्नक्रमांकासमोर छायांकित करून दर्शविला जाईल याची काळजी घ्यावी. **ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

(5) सर्व प्रश्नांना समान गुण आहेत. यास्तव सर्व प्रश्नांची उत्तरे द्यावीत. घाईमुळे चुका होणार नाहीत याची दक्षता घेऊनच शक्य तितक्या वेगाने प्रश्न सोडवावेत. क्रमाने प्रश्न सोडविणे श्रेयस्कर आहे पण **एखादा प्रश्न कठीण वाटल्यास त्यावर वेळ न घालविता पुढील प्रश्नाकडे वळावे.** अशा प्रकारे शेवटच्या प्रश्नापर्यंत पोहोचल्यानंतर वेळ शिल्लक राहिल्यास कठीण म्हणून वगळलेल्या प्रश्नांकडे परतणे सोईस्कर ठरेल.

(6) उत्तरपत्रिकेत एकदा नमूद केलेले उत्तर खोडता येणार नाही. नमूद केलेले उत्तर खोडून नव्याने उत्तर दिल्यास ते तपासले जाणार नाही.

(7) **प्रस्तुत परीक्षेच्या उत्तरपत्रिकांचे मूल्यांकन करताना उमेदवाराच्या उत्तरपत्रिकेतील योग्य उत्तरांनाच गुण दिले जातील. तसेच ''उमेदवाराने वस्तुनिष्ठ बहुपर्यायी स्वरूपाच्या प्रश्नांची अचूक उत्तरेच उत्तरपत्रिकेत नमूद करावीत. अन्यथा त्यांच्या उत्तरपत्रिकेत सोडविलेल्या प्रत्येक चार चुकीच्या उत्तरांसाठी एका प्रश्नाचे गुण वजा करण्यात येतील''.**

ताकीद

ह्या प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपेपर्यंत ही प्रश्नपुस्तिका आयोगाची मालमत्ता असून ती परीक्षाकक्षात उमेदवाराला परीक्षेसाठी वापरण्यास देण्यात येत आहे. ही वेळ संपेपर्यंत सदर प्रश्नपुस्तिकेची प्रत/प्रती, किंवा सदर प्रश्नपुस्तिकेतील काही आशय कोणत्याही स्वरूपात प्रत्यक्ष वा अप्रत्यक्षपणे कोणत्याही व्यक्तीस पुरविणे, तसेच प्रसिद्ध करणे हा गुन्हा असून अशी कृती करणाऱ्या व्यक्तीवर शासनाने जारी केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचा अधिनियम-82'' यातील तरतुदीनुसार तसेच प्रचलित कायद्याच्या तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

तसेच ह्या प्रश्नपत्रिकेसाठी विहित केलेली वेळ संपण्याआधी ही प्रश्नपुस्तिका अनधिकृतपणे बाळगणे हा सुद्धा गुन्हा असून तसे करणारी व्यक्ती आयोगाच्या कर्मचारीवृंदापैकी, तसेच परीक्षेच्या पर्यवेक्षकीयवृंदापैकी असली तरीही अशा व्यक्तीविरुद्ध उक्त अधिनियमानुसार कारवाई करण्यात येईल व दोषी व्यक्ती शिक्षेस पात्र होईल.

पर्यवेक्षकांच्या सूचनेविना हे सील उघडू नये

SEAL

सूचना – (पृष्ठ 1 वरून पुढे....)

(8) प्रश्नपुस्तिकेमध्ये विहित केलेल्या विशिष्ट जागीच कच्चे काम (रफ वर्क) करावे. प्रश्नपुस्तिकेव्यतिरिक्त उत्तरपत्रिकेवर कागदावर कच्चे काम केल्यास ते कॉपी करण्याच्या उद्देशाने केले आहे, असे मानले जाईल व त्यानुसार उमेदवारावर शासनाने केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचे अधिनियम-82'' यातील तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

(9) सदर प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपल्यानंतर उमेदवाराला ही प्रश्नपुस्तिका स्वत: बरोबर परीक्षाकक्षाबाहेर घेऊन जाण्यास परवानगी आहे. **मात्र परीक्षाकक्षाबाहेर जाण्यापूर्वी उमेदवाराने आपल्या उत्तरपत्रिकेचा भाग – 1 समवेक्षकाकडे न विसरता परत करणे आवश्यक आहे.**

नमुना प्रश्न

प्रश्न क्र. 201. The Catch varies inversely with the size of the :

(1) nozzle (2) droplet

(3) obstruction (4) sprayer

ह्या प्रश्नाचे योग्य उत्तर ''(3) obstruction'' असे आहे. त्यामुळे या प्रश्नाचे उत्तर ''(3)'' होईल, आता **खालीलप्रमाणे** प्र. क्र. **201** समोरील उत्तर-क्रमांक ''③'' हे वर्तुळ खालीलप्रमाणे पूर्णपणे छायांकित करून दाखविणे आवश्यक आहे.

प्र.क्र. 201. ① ② ● ④

अशा पद्धतीने प्रस्तुत प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाचा तुमचा उत्तरक्रमांक हा तुम्हाला स्वतंत्ररीत्या पुरविलेल्या उत्तरपत्रिकेवरील त्या त्या प्रश्नक्रमांकासमोरील संबंधित वर्तुळ पूर्णपणे छायांकित करून दाखवावा. **ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

पर्यवेक्षकांच्या सूचनेविना हे पृष्ठ उलटू नये

SPACE FOR ROUGH WORK

1. Draft animal can produce pull of _____ kg, if its body weight is 450 kg
   (1) 50 kg (2) 100 kg (3) 45 kg (4) 450 kg

2. If compression ratio is increased, thermal efficiency of Otto cycle will _____
   (1) Increase (2) Decrease (3) Remain same (4) Fluctuate

3. For complete combustion of 1 kg petrol, about _____ kg of air is required.
   (1) 1 (2) 10 (3) 15 (4) 20

4. In order to improve volumetric efficiency of the high speed I.C. engine _____ is used.
   (1) Battery charger (2) Electronic injection
   (3) Injection pump (4) Turbo-charger

5. Pump provided on Diesel Tractor fuel system for bleeding air is _____
   (1) Fuel Lift Pump (2) Fuel Injection Pump
   (3) Centrifugal Pump (4) Hand Pump

6. _____ gear is also called as half time gear.
   (1) Crank shaft (2) Bevel (3) Cam shaft (4) Tappet

7. Tractor on which Kirloskar RA-3 Diesel Engine is installed is
   (1) Escort (2) Massey-Ferguson
   (3) International (4) Mahindra and Mahindra

8. Power output of a diesel engine can be increased by using _____ device.
   (1) Air cell chamber (2) Indirect injection
   (3) Turbo charger (4) Half injection

9. A row crop tractor has generally _____ ground clearance.
   (1) Low (2) High (3) Adjustable (4) Equal to track

SPACE FOR ROUGH WORK

10. The power tillers are steered by _____

(1) Steering wheel (2) Turn table

(3) Clutch (4) Brakes

11. When two drive wheels are connected by a differential system, the algebraic sum of speeds of these wheels will _____

(1) Reduce (2) Increase

(3) Be always constant (4) Be variable

12. Planetary final drive has at least _____ number of gears in the system.

(1) Two (2) Three

(3) Four (4) Any

13. Test Code followed in India for testing tractors is a combination of Test Codes followed in

(1) U.S.A. and U.K. (2) China and Japan

(3) India and China (4) U.S.A. and China

14. _____ is the natural frequency of a tractor seat suspension.

(1) 6 to 8 cycles/sec. (2) 8 to 10 cycles/sec.

(3) 2 to 3 cycles/sec. (4) 4 to 6 cycles/sec.

15. Fixed costs generally include except one among the following

(1) Depreciation (2) Interest on investment

(3) Insurances (4) Fuels

16. The parameters that affect traction in a tractor are

a) Weight b) Tyre width

c) Lugs d) Soil type

(1) a, b are correct only (2) Only c, d are correct

(3) a, b, c and d all are correct (4) Only c is correct

SPACE FOR ROUGH WORK

17. The main objective of primary tillage is to _____

(1) Break the clods (2) Break the hard pan

(3) Kill the weeds (4) Kill the insects

18. Most of the tillage equipments work on the principle of _____

(1) Soil shearing (2) Soil compression

(3) Soil tension (4) Soil creep

19. The pulling force required to operate the implement can be measured by _____

(1) PTO dynamometer (2) Prony brake dynamometer

(3) Draw bar dynamometer (4) Eddy current dynamometer

20. Side draft on the mould board plough is counter acted by _____

(1) Plough share on furrow bottom (2) Mould board on furrow wall

(3) Land side on furrow bottom (4) Land side on furrow wall

21. Common clod crusher which is a wooden log of rectangular cross section is _____

(1) Pat (2) Pata (3) Phata (4) Patta

22. _____ is a versatile implement used for seedbed preparation, ridge making, channel shaping and weeding.

(1) Harrow (2) Cultivator (3) Hoe (4) Bund former

23. How many tyres do Bardoli hoe have ?

(1) 1 (2) 2 (3) 3 (4) 4

24. Centre of resistance of an implement lies on

(1) Implement (2) Tractor

(3) Implement and tractor (4) Soil

SPACE FOR ROUGH WORK

25. The seed flow rate from orifice type metering seed drill, is affected by

(1) Area of orifice (2) Static pressure of seed

(3) Shape and size of hopper (4) All of above

26. Fluted roller type seed metering mechanism is useful for _____

(1) Planting ground nut (2) Drilling wheat

(3) Drilling onion seed (4) Planting jowar

27. _____ type furrow openers are suitable for vegetable transplanter useful in black cotton soil.

(1) Shovel (2) Sweep (3) Disc (4) Shoe

28. In self propelled paddy transplanters the plant to plant spacing is maintained by _____

(1) Number of cells on rotor (2) Speed of picker arm

(3) Ground wheel revolution (4) Forward speed of transplanter

29. Olpad thresher is having _____ discs in three rows.

(1) 17 (2) 20 (3) 23 (4) 26

30. The cutter bar of a mower is set at an angle of _____ to the direction of motion.

(1) 60° (2) 75° (3) 80° (4) 88°

31. The recommended drive speed for different crop varies between _____ rpm for multicrop thresher.

(1) 1000 – 1500 (2) 500 – 850

(3) 200 – 300 (4) 2000 – 2500

32. Operation that cannot be performed by a combine is

(1) Threshing the seed from the head (2) Separating the seed from the straw

(3) Cleaning the seed from the chaff (4) Grinding of the cleaned seed

SPACE FOR ROUGH WORK

33. Generally spraying of weedicides is classified as _____ spraying.

(1) High (2) Low (3) Very low (4) Ultra low

34. Number Mean Diameter (NMD) of spray droplets is always _____ Volume Median Diameter (VMD).

(1) Equal to (=) (2) Smaller than (<)

(3) Greater than (>) (4) Greater than or equal to ($\geq$)

35. If the pressure on spray liquid is increased, the droplet size will _____

(1) Increase (2) Decrease

(3) Remain unchanged (4) Not be uniform

36. Hydraulic energy sprayers produce _____ droplets as compared to gaseous energy sprayers.

(1) Coarse (2) Fine

(3) Uniform (4) Same sized

37. Dusters may be classified into except one of the following

(1) Plunger type hand duster (2) Rotary type hand and power duster

(3) Air plane duster (4) Gator duster

38. To distribute the chemicals uniformly on the target, _____ is required in sprayer.

(1) Pump (2) Agitator (3) Nozzle (4) Swirl chamber

39. Before storing the duster after use, the dust from the following parts except one should be thoroughly blown out and the agitation shaft should be profusely oiled while cranking

(1) fan box (2) suction pipe

(3) hopper (4) p.t.o. shaft

P.T.O.

SPACE FOR ROUGH WORK

40. In tractor mounted sprayer _____ type of agitation is provided.

(1) Pressure (2) Hydraulic (3) Mechanical (4) Pneumatic

41. Drying refers to the removal of moisture until the moisture content of product is in equilibrium with _____

(1) Field capacity (2) Surrounding air

(3) Bone dry weight (4) Absolute zero

42. If a grain has 25 percent moisture, on dry basis, how much moisture, on wet basis is there in the grain ?

(1) 15% (2) 20% (3) 25% (4) 30%

43. The equilibrium moisture content could be determined by

(1) Without mechanical agitation of air or product

(2) Moving air or product mechanically

(3) Any one of the above two

(4) None of the above

44. A curve representing moisture content relationships plotted for a constant moisture content is called as _____

(1) Isostere (2) Isopiestic line (3) Isobar (4) Isotherm

45. If 1 ton of grain having 25% moisture, w.b. is dried to 14% moisture, w.b. how much water has been removed from grain ?

(1) 250 kg (2) 140 kg (3) 128 kg (4) 166 kg

46. Except one of the following all are known as drying curves

(1) Moisture content versus drying time

(2) Drying rate versus drying time

(3) Drying rate versus moisture content

(4) E.M.C. versus moisture content

SPACE FOR ROUGH WORK

47. Louisiana State University Dryer consists of all the parts except one of the

(1) Circular bin (2) Air distribution system

(3) Grain discharging mechanism (4) Air heating system

48. Louisiana State University (LSU) grain dryer which is popular in India and U.S.A. is a

(1) Continuous flow mixing dryer (2) Non mixing dryer

(3) Batch mixing dryer (4) Partly mixing dryer

49. The Psychrometric chart can be used to find out the following temperatures except one

(1) Dry bulb temperature (2) Wet bulb temperature

(3) Dew point temperature (4) Human body temperature

50. By using solar collector with dryer the drying time is saved up to

(1) 20 to 30% (2) 30 to 40%

(3) 50 to 70% (4) 70 to 75%

51. The air velocity at which a particle remains in suspended state in a vertical pipe is called as _____

(1) Relative velocity (2) Flow velocity

(3) Gravitational velocity (4) Terminal velocity

52. Various types of cleaning, grading and separation equipments are designed on the basis of _____ properties of seeds.

(1) Physical (2) Mechanical

(3) Rheological (4) Thermal

53. When the bulk of grain is in motion, like discharge from bins and hoppers _____ is important.

(1) Angle of internal friction (2) Static angle of repose

(3) Dynamic angle of repose (4) Angle of fall

SPACE FOR ROUGH WORK

54. The material which shows pure plastic behaviour is called as _____

(1) Hookean body (2) St. Venant body

(3) Newtonian liquid (4) Stokes liquid

55. The amount of heat that must be added or removed from unit mass of substance to change its temperature by 1°C is called as _____

(1) Enthalpy (2) Thermal conductivity

(3) Thermal diffusivity (4) Specific heat

56. The resistance offered by the grainbed to the air current blown through it dose not depend on

(1) The bed thickness (2) The air velocity

(3) Orientation of the grain (4) Colour of the grain

57. In bucket elevator spacing between two successive buckets is _____ times the projected width of bucket.

(1) 3.5 to 4 (2) 3 to 3.5 (3) 2 to 3 (4) 4 to 5

58. Screw conveyor requires relatively high power and is more susceptible to wear than except one of the following material handling equipments

(1) Belt conveyors (2) Bucket conveyors

(3) Pneumatic conveyors (4) Pulley conveyors

59. For Transportation of grains by belt conveyor the speed of belt should not exceed

(1) 0.350 m/s (2) 3.500 m/s

(3) 3500 m/s (4) 350.000 m/s

60. For dispersion of bulk material air velocities in the range of one of the following is necessary

(1) 15 to 30 m/s (2) 35 to 50 m/s

(3) 55 to 70 m/s (4) 75 to 90 m/s

SPACE FOR ROUGH WORK

61. The main purpose of agricultural processing is to _____

(1) Reduce the quantity of output

(2) Add to the quantity of output

(3) Minimize quantitative and qualitative deterioration

(4) Minimize qualitative utility

62. The bulk post harvest losses occur during _____

(1) Transportation (2) Storage

(3) Packaging (4) Processing

63. Washing, screening, hand picking are methods of _____

(1) Sorting (2) Grading (3) Packing (4) Cleaning

64. The minimum clear space between the edges of opening in the screening surface is called _____

(1) Clearance (2) Gap (3) Space (4) Aperture

65. The rotary air screen cleaner has circular vibrating decks rotating in _____ plane.

(1) Vertical (2) Horizontal (3) Inclined (4) Tilting

66. In wet milling of tur the grains are soaked in water and the soaked pulses are thoroughly mixed with

(1) Wet red earth (2) Wet green sand

(3) Wet wood ash (4) Wet salt powder

67. In size reduction process, fineness modulus indicates

(1) Particle size

(2) Sieve size

(3) Uniformity of grind in resultant product

(4) None of the above

SPACE FOR ROUGH WORK

68. What is the expected life of dryers ?

(1) 60 years (2) 45 years (3) 30 years (4) 15 years

69. Operation not performed by modern rice mill is

(1) Separation (2) Whitening

(3) Grading (4) Mixing with red earth

70. Capacity of rectangular bin to store one tonne wheat will be

(1) $1.4\,m^3$ (2) $1.0\,m^3$ (3) $2.0\,m^3$ (4) $1.6\,m^3$

71. The basic objective of material balance is to identify the _____ and _____ of various streams entering and leaving system.

(1) Weights, composition (2) Weights, energy

(3) Energy, composition (4) None of the above

72. The solids in dehydration or evaporation process and nitrogen in combustion process are called _____

(1) Catalyst (2) Tie material

(3) Waste material (4) Concentrate

73. Pasteurization of milk is performed by heating _____ particle of milk to 71° C for at least _____

(1) Every, 30 minutes (2) Some, 15 seconds

(3) Every, 15 seconds (4) Some, 30 minutes

74. In continuous pasteurizer milk at _____ °C is fed into regeneration unit and after pasteurization cooled to _____ °C in the same unit.

(1) 5, 18 (2) 18, 5 (3) 25, 10 (4) 10, 25

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75. _____ is the most common method of sterilization.

(1) Forced convection of hot air (2) Indirect heating by saturated steam

(3) Indirect heating by boiling water (4) Direct flame contact

76. In sharp freezing, foods are placed in cold rooms maintained at

(1) 0° to – 15° C (2) – 10° to – 15° C

(3) – 15° to – 28° C (4) – 20° to – 40° C

77. Heat exchanger goes under many names except one of the following

(1) Boilers (2) Foot pumps (3) Cookers (4) Ovens

78. Sterilization of food in containers can be done by

(1) Indirect heating by saturated steam

(2) Forced convection of hot air

(3) By direct flame contact

(4) All the above methods

79. What quantity of brine is required to remove 2560 Kcal from a liquid, if brine has a specific heat 0.7 and its temperature is changed from – 15° C to 10° C ?

(1) 160 kg (2) 140 kg (3) 210 kg (4) 145 kg

80. Which of the following is not a contact equilibrium separation process ?

(1) Distillation (2) Crystallization

(3) Membrane separation (4) Concentration

81. Which type of starters are widely used for three phase motors above 10 horsepower ?

(1) Star-delta starters (2) Manual switch starters

(3) Push button starters (4) Iron hook

82. What is the purpose of step-up transformer ?

(1) To increase voltage (2) To increase current

(3) To increase frequency (4) To increase power

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83. What is the purpose of laminated care of the transformer ?

(1) Simplify its construction (2) Minimise eddy current loss

(3) Reduce the cost (4) For proper insulation

84. The satisfactory use of electric fence depends upon _____

(1) The controller (2) Installation

(3) Training of the live stock (4) All of the above

85. Rotor of an induction motor cannot run with synchronous speed because

(1) Rotor torque would become zero

(2) Lenz's law would be violated

(3) Induction motor would then become synchronous motor

(4) Due to air friction

86. In which direction the flat plate solar collector should be placed in sun to get better results ?

(1) North-South (2) South-North

(3) East-West (4) West-East

87. What is the effective temperature of the sun ?

(1) 5762° K (2) 7528° K (3) 14572° K (4) 60,000° K

88. The sun's declination angle (∂) in northen sphere on June 22 and December 22 are _____ respectively.

(1) $+20.5°$ and $-20.5°$ (2) $+23.5°$ and $-23.5°$

(3) $+22.5°$ and $-22.5°$ (4) $+21.5°$ and $-21.5°$

89. Pyrheliometer is an instrument for measuring the intensity of _____ solar radiation.

(1) Direct (2) Diffuse

(3) Global (4) None of the above

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90. The energy of photon is related to wave length by the equation.

(1) $\frac{hc}{\lambda}$ (2) $h^2c\lambda$ (3) $\frac{\lambda}{hc}$ (4) $\frac{c}{h\lambda}$

91. Which are the two primary mechanisms for producing forces from the wind ?

(1) Pressure and Velocity (2) Vacuum and Force

(3) Heat and Mass (4) Lift and Drag

92. The multiblade type wind mills with high starting torque are more suitable for _____

(1) Pumping water (2) Electric power generation

(3) Driving heat engines (4) None of these

93. The ideal or maximum theoretical efficiency (Power coefficient) of a wind turbine is _____

(1) 16/27 (2) 1/2 (3) 4/27 (4) 2/3

94. If wind speed decreases by 20 percent, the power output is reduced by atmost _____ percent.

(1) 10 (2) 30 (3) 50 (4) 75

95. _____ is an attachment through which the blades are attached to the transmission.

(1) Rotor (2) Hub

(3) Low speed shaft (4) None of these

96. Methane formers are sensitive to pH changes, for fermentation and normal gas production, a pH value between _____ is the best.

(1) 6.5 to 8 (2) 1.5 to 3 (3) 10 to 20 (4) 25 to 30

97. In fixed dome type biogas unit what is the diameter to height ratio of the digester in Janata biogas plant ?

(1) 0.5 : 1 (2) 0.5 : 2 (3) 0.5 : 3 (4) 1.75 : 1

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98. Biogas is a substitute for conventional engine fuel and in CI engine, the di replacement (in proper working of engine) of about _____ is possible using biogas.

(1) 40% (2) 60% (3) 80% (4) 100%

99. _____ is particularly harmful when biogas is used in internal combustion engine.

(1) CO_2 (2) H_2S (3) CO (4) CH_3

100. The brightness and force of combustion of the stove and lamp depends on the _____

(1) Calorific value of biogas

(2) Size of the nozzle

(3) Biogas pressure and mixing of ratio of biogas with air

(4) All of the above

101. _____ indicate the maximum load per unit area which the soil will resist safely without displacement.

(1) Bearing capacity (2) Force

(3) Pressure intensity (4) None of these

102. Wall is constructed to protect the natural sloping ground from the cutting action of weathering agents

(1) retaining wall (2) cavity wall

(3) breast wall (4) brick wall

103. Fencing which is more effective than plain wire and is cheaper than the woven wire fencing used for confining the large cattle.

(1) Welded plain wire (2) Hexagonal wire type

(3) Electric (4) Barbed

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104. Polyethylene type covering material in green house has transmitivity as m

(1) 90% (2) 77% (3) 50% (4) 20%

105. The required floor space per hen for 25 small breed hens is _____

(1) 0.25 sq. m. (2) 0.28 sq. m. (3) 0.32 sq. m. (4) 0.37 sq. m.

106. Green house structure should be designed to resist a wind velocity of

(1) 90 Km/hr (2) 100 Km/hr (3) 130 Km/hr (4) 60 Km/hr

107. The capillary water is held between tensions of about 31 atmosphere and _____ atmosphere.

(1) zero (2) fifteen (3) one third (4) one fourth

108. The _____ type of special foundation is suitable for bridges and reservoirs.

(1) Grillage foundation (2) Raft foundation

(3) Inverted arches (4) All of the above

109. The lower projecting wall from the foundation to the floor level that supports the super structure along with the roofing is known as

(1) foundation (2) retaining wall

(3) plinth (4) flat roofs

110. Sedimentation analysis is based on _____ law.

(1) Darcy's (2) Stoke's

(3) Sedimentation (4) Pascal's

111. Hydraulic Gradient Line (H.G.L.) represents the sum of

(1) pressure head and kinetic head

(2) kinetic head and datum head

(3) pressure head, kinetic head and datum head

(4) pressure head and datum head

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112. When the fluid pressure is measured either above or below the atmospheric pres as a datum, it is called _____

(1) Absolute pressure (2) Gauge pressure

(3) Atmospheric pressure (4) Vacuum pressure

---

113. A venturimeter is a device used for measurement of the rate of flow of fluid through _____

(1) pipe (2) tank (3) channel (4) well

---

114. The discharge through a trapezoidal channel is maximum when

(1) half of top width = sloping side (2) top width = half of sloping side

(3) top width = 1.5 × sloping side (4) none of these

---

115. What will be the uniformity coefficient (Cu) of the sprinkler system if the $\Sigma x = 17.1$ and mn = 177.7 ?

(1) 89.4% (2) 90.4% (3) 91.4% (4) 92.4%

---

116. In case of direct irrigation scheme, a weir or a barrage is constructed across the river and water is headed up on the upstream side. The arrangement is known as

(1) head regulators (2) off take

(3) head works or division head works (4) water course

---

117. The drainage coefficient of a land is 10 mm. Calculate the capacity of the outlet end of the drainage ditch draining a watershed of 300 ha.

(1) 0.437 m^3/sec. (2) 0.734 m^3/sec.

(3) 0.547 m^3/sec. (4) 0.347 m^3/sec.

---

118. The removal of abrupt irregularities such as mounds, dunes and ringes and filling of pits, depressions and gullies is called

(1) land levelling (2) rough grading

(3) land forming (4) land smoothing

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119. What kind of roof is useful at places where rainfall or snowfall is heavy ?

(1) pitched roof (2) flat roof (3) curved roof (4) terraced roof

120. Unconfined aquifer is

(1) a permeable bed, only partly filled with water and overlaying a relatively impervious layer

(2) an aquifer found between two impermeable layers

(3) a leaky aquifer

(4) a completely saturated aquifer

121. The following drainage system consists of parallel lateral drains that enter the main drain at an angle, usually from both sides.

(1) Random (2) Gridiron (3) Interceptor (4) Herringbone

122. _____ is the ratio of mean supply discharge to the full supply discharge.

(1) Out let factor (2) Canal factor

(3) Capacity factor (4) None of these

123. The Kutter's equation is best suited in designing the canal based on _____ theory.

(1) Kennedy's (2) Lacey's (3) Khosala's (4) Bligh's

124. Water cement ratio by volume for hydration hardening of cement theoretically works out to be

(1) 0.66 (2) 0.76 (3) 0.08 (4) 1.00

125. The suction head of centrifugal pump is limited to _____ m.

(1) 6.0 (2) 10.0 (3) 21.0 (4) 33.0

126. Usually the cut fill ratio in land levelling varies from

(1) 1.2 to 1.6 (2) 3.0 to 3.5 (3) 2.5 to 3.5 (4) 3.0 to 4.0

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127. Soils having the following type of structure has the poorest drainage property.

(1) Platy (2) Prismatic (3) Blocky (4) Columnar

128. The discharge-drawdown relationship of an irrigation well is known as

(1) Well log (2) Well characteristics

(3) Circle of influence (4) Radius of influence

129. Towards downstream the capacity of drainage channel in drainage system should _____

(1) Increase (2) Decrease

(3) Same throughout channel (4) All of the above

130. The process of distribution of irrigation water through canals is called as

(1) Scheduling (2) Rostering

(3) Irrigation interval (4) Irrigation period

131. In the _____ method, a single fluid particle is followed during its motion and its velocity, acceleration, density etc.

(1) Eulerian (2) Kennedy's (3) Lagrangian (4) Lacey's

132. The settlement allowance with the plane method of computing cut and fill may range from _____ for compact soils.

(1) 2 to 3.2 cm (2) 1.5 to 4.5 cm

(3) 0.3 to 1 cm (4) 0.2 to 0.8 cm

133. Whose assumption is used for hydraulic design of steady state subsurface drainage system ?

(1) Kessler (2) Dupuit-Forchheimer

(3) Glover (4) Bouver

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134. For moderate slopes and small to moderate size irrigation streams, the length o for clay soils should be _____ m.

(1) 100 to 180 (2) 60 to 120 (3) 150 to 300 (4) None of these

135. The infiltration opportunity time at any point along the border is the vertical distance (in time scale) between the advance and _____ curves at the point.

(1) Infiltration (2) Seepage (3) Moisture (4) Recession

136. A saturated but relatively impermeable material that does not yield appreciable quantities of water to wells is _____

(1) Aquitard (2) Aquifuge (3) Aquiclude (4) None of these

137. The method of land levelling design which is adopted for moderate to flat land slope is

(1) Profile method (2) Plan inspection method

(3) Plane method (4) Contour adjustment method

138. The maximum non-erosive flow rate in furrows is estimated by the _____ equation.

(1) $q_m = \frac{6.0}{S}$ (2) $q_m = \frac{60}{S}$ (3) $q_m = \frac{0.6}{S}$ (4) $q_m = \frac{360}{S}$

139. The operating head of emitters of drip irrigation system is generally less than _____ m.

(1) 10 (2) 20 (3) 30 (4) 40

140. While designing the sprinkler irrigation system the pressure variation in laterals, when practicable, should not be more than _____ % of the higher pressure.

(1) 6 (2) 10 (3) 20 (4) 33

141. A unit hydrograph represents

(1) One unit of peak discharge

(2) One unit of rainfall duration

(3) Direct runoff resulting from one unit depth of excess rainfall

(4) None of the above

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142. The hydrologic cycle

(1) Has beginning but no end

(2) Has both beginning and end

(3) Is a continuous unending water transfer cycle

(4) None of the above

143. Average condition regarding run off potential of a watershed is

(1) AMC – I (2) AMC – II (3) AMC – III (4) None of the above

144. What does the rational method compute ?

(1) Runoff volume (2) Rainfall intensity

(3) Runoff rate (4) Peak runoff rate

145. The return period of a rainfall magnitude, whose probability is 20% will be

(1) 2 years (2) 20 years (3) 5 years (4) None of the above

146. Base flow is separated for obtaining

(1) Unit hydrograph (2) Hyetograph

(3) Surface flow hydrograph (4) Flood hydrograph

147. The normal onset of monsoon in India is in

(1) Early June at Mumbai and Chennai (2) Early June at Kerala and Assam

(3) Early May in Kerala only (4) November in Tamil Nadu and Kerala

148. The base flow separation is performed by

(1) Straight line method (2) Base flow-recession curve method

(3) Chow method (4) All of the above

149. Weibuls formula computes

(1) Average depth of precipitation (2) Rainfall intensity

(3) Plotting position (4) All of the above

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150. Recording type raingauge records rainfall in terms of

(1) Depth only (2) Depth and time

(3) Volume (4) None of the above

151. Prism storage is a function of

(1) Outflow (2) Inflow

(3) Both (1) and (2) (4) None of these

152. The shape of falling limb is dependent on

(1) Storm characteristics (2) Watershed characteristics

(3) Both (1) and (2) (4) None of these

153. Which of the following curves is always rising ?

(1) Hyetograph (2) Mass curve

(3) Hydrograph (4) None of these

154. Hyetograph is the plot of

(1) Discharge Vs. time (2) Cumulative rainfall Vs. time

(3) Intensity of rainfall Vs. time (4) None of these

155. Which of the following is not a recording type rain gauge ?

(1) Siphon type (2) Symons type

(3) Weighing balance type (4) Tipping bucket type

156. Area reduction method of estimation of sedimentation is used for prediction of

(1) Useful life of reservoirs

(2) Sediment deposition in the reservoir

(3) Sediment distribution in the reservoir

(4) Density currents in the reservoir

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157. Sediment yield from the catchment refers to

(1) Total soil loss from an area

(2) Product of gross erosion and delivery ratio

(3) Gross erosion from an area

(4) Sediment deposition in the reservoir

158. Evaluation of sediment source at farm scale unit is called as

(1) Meso scale (2) Micro scale (3) Macro scale (4) None of the above

159. Entrainment of soil particle refers to the

(1) Transportation of sediment (2) Detachment of particles

(3) Deposition of particles (4) All the above

160. Shear strength or erosive energy of flowing water is increased by

(1) Sediment concentration (2) Depth of flow

(3) Particle size (4) All the above

161. Grassed waterways are designed to carry stream flow with average velocity of

(1) 1.0 m/s (2) 1.5 to 2.0 m/s (3) 2.5 m/s (4) > 2.5 m/s

162. The protection of gentle to medium slopes from erosion, flooding and sediment deposition due to stream, can be achieved with

(1) Water harvesting structures

(2) Check dams

(3) Channel improvement for gradient and alignment

(4) Stream Bank erosion control

163. For the same carrying capacity, a parabolic shaped channel has

(1) Smaller hydraulic radius than the triangular channel

(2) Greater hydraulic radius than the triangular channel

(3) Greater hydraulic radius than trapezoidal channel

(4) Greater hydraulic radius than rectangular channel

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164. Drop spillways are usually limited to drops of

(1) 1 – 2 metre (2) 2 – 3 metre (3) 3 – 4 metre (4) 4 – 6 metre

165. The criterion considered while designing spacing of contour/graded bunds, is

(1) Linear proportionality with slope steepness

(2) Length of slope, attaining erosive velocity

(3) Rainfall characteristics

(4) Soil characteristics

166. If the land slope is increased four times, the velocity of flowing water is

(1) Approximately doubled (2) Increased four times

(3) Increased eight times (4) None of the above

167. The USLE was developed by

(1) Hudson (2) Morgan (3) Wischmeier (4) Hermsmeier

168. If d and v are the diameter and velocity of a raindrop, respectively, then its erosive power is proportional to

(1) d^2v^3 (2) d^3v^2 (3) d^2v^2 (4) d^3v^3

169. The vertical interval for bench terrace for batter slope 1 : 1 is given by

(1) VI = WS / (100 – S) (2) VI = WS / (200 – S)

(3) VI = (100 – S) / WS (4) none of the above

170. The bunds constructed between two contour bunds so as to limit the horizontal spacing to the maximum required are known as

(1) lateral bunds (2) supplemental bunds

(3) marginal bunds (4) side buds

171. The curve number (CN) =

(1) 2540 / (254 + S) (2) 2540 / (2.54 + S)

(3) 2540 / (25.4 + S) (4) 2540 / (0.254 + S)

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172. Rational formula estimates

(1) recharge (2) interception loss

(3) peak rate of run off (4) none of these

173. The permissible flow velocity in the vegetated waterway for good grass cover ranges from

(1) 0.9 to 1.2 m/s (2) 1.5 to 1.8 m/s

(3) 2.0 to 2.5 m/s (4) none of these

174. In wind erosion, large amount of soil is lost through

(1) suspension (2) saltation (3) surface creep (4) none of these

175. The time required to reach surface runoff from remotest point of the watershed to it's outlet is known as

(1) Unit period (2) Storm duration

(3) Time of concentration (4) None of the above

176. All watershed development works should start from the

(1) Lower reaches to the upper reaches

(2) Upper reaches to the lower reaches

(3) Middle reaches to the lower reaches

(4) None of the above

177. In flood plain management for flood control, in which zone precaution against flood is more essential

(1) Warning zone (2) Restrictive zone

(3) Prohibitive zone (4) None of the above

178. Chances of flood due to torrential runoff are more, when the drainage density is

(1) Low (2) Moderate (3) High (4) None of the above

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179. The main purpose of percolation ponds is

(1) Flood protection (2) Irrigation

(3) Drainage (4) Groundwater recharge

180. Standard Project Flood (SPF) for a basin is usually around

(1) 40 – 60% of MPF (2) 90% of MPF

(3) 70% of MPF (4) 80% of MPF

181. Rip-rap means

(1) The construction of the drains in earthen dams

(2) The outlet structure of farm pond

(3) The drystone revetment on the slopes of embankment for protection against wave action

(4) None of the above

182. The maximum effectiveness of contour cultivation is on

(1) Medium slope (2) Flat slope (3) Steep slope (4) All the above

183. The berm width adopted in case of dug out pond may be

(1) Less than half of the pond depth (2) Equal to the depth of pond

(3) Twice the depth of pond (4) None of the above

184. In the excavated ponds, the storage to earthwork ratio is generally around

(1) 1.0 (2) 1.5 (3) 1.7 (4) 2.0

185. For which rainfall areas, the inward sloping terraces are suitable ?

(1) Low (2) Medium (3) High (4) Both 1 and 3

186. According to coding of watershed by the All India and Soil and Land Use Survey, the extent of watershed can be

(1) 0.1 – 0.5 lakh ha (2) 2.0 – 10.0 lakh ha

(3) 0.5 – 2.0 lakh ha (4) 0.01 – 0.1 lakh ha

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187. For demarcation of priority and vulnerable areas, reasonable and viable s delineated watershed should be in range of

(1) 1 to 1,000 ha
(2) 1,000 to 10,000 ha
(3) 10,000 to 20,000 ha
(4) 20,000 to 50,000 ha

188. A best site for farm fond construction is

(1) Narrow valley with steep sides and impervious substrata
(2) A clay formation with large areas of shallow water
(3) A depressed location with pervious layer below
(4) All the above

189. Bench terraces used in heavy rainfall area are

(1) Inward sloping type
(2) Outward sloping type
(3) Level type
(4) None of the these

190. The ratio of basin area to the square of the basin length is known as

(1) Circulatory ratio
(2) Form factor
(3) Relief ratio
(4) Elongation ratio

191. Evaporation is expressed as

(1) cm/day
(2) mm/hour
(3) mm/day
(4) none of the above

192. The practice of converting the land into series of platforms for cultivation of slopy areas is known as

(1) Contour bunding
(2) Contour cultivation
(3) Bench terracing
(4) Graded bunding

193. Ratio of the number of stream of any order to the number of stream of next lower order is known as

(1) Stream order
(2) Circulatory ratio
(3) Bifurcation ratio
(4) Stream length ratio

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194. The process of detachment, transportation and deposition of soil particles fr place to another place is known as

(1) Sedimentation (2) Soil erosion

(3) Flood routing (4) None of these

195. Deterioration of watershed causes following consequences

(1) Low productivity from agriculture

(2) Poor quality water yield

(3) Occurrence of frequent floods and droughts

(4) All of the above

196. Which of the following lands are not suitable for cultivation ?

(1) Class – II (2) Class – III (3) Class – IV (4) Class – V

197. The number of stream segments per unit area of watershed is known as

(1) Drainage density (2) Stream frequency

(3) Stream order (4) Relief

198. Which drought takes place when soil moisture is not adequate during growth stages of crops ?

(1) Meteorological drought (2) Agricultural drought

(3) Hydrological drought (4) None of these

199. How much subsidy, the Government of Maharashtra is giving to the farmers for excavation of farm pond ?

(1) 100% (2) 75% (3) 50% (4) 25%

200. Which of the following is a flood control measure ?

(1) Levee (2) Bypass channel

(3) Cut off (4) All of the above

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