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महा. कृषि सेवा परीक्षा-२००८
दि.२० व २१/२/२००८

सूचना

(1) <u>सदर प्रश्नपुस्तिकेत 200 अनिवार्य प्रश्न आहेत.</u> 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.

परीक्षा-क्रमांक

केंद्राची
संकेताक्षरे

शेवटचा
अंक

(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 शाईचें 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 वळवे.* 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. त्या प्राप्त गुणांतून त्यांनी उत्तरपत्रिकेत चुकीची उत्तरे नमूद केल्याबद्दल गुण वजा केले जाणार नाहीत.

(8) प्रश्नपुस्तिकेमध्ये विहित केलेल्या विशिष्ट जागीच कच्चे काम (रफ वर्क) करावे. प्रश्नपुस्तिकेव्यतिरिक्त उत्तरपत्रिकेवर वा इतर कागदावर कच्चे काम केल्यास ते कॉपी करण्याच्या उद्देशाने केले आहे, असे मानले जाईल व त्यानुसार उमेदवारावर शासनाने जारी 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) -->

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 व्यक्तीविरूद्ध उक्त अधिनियमानुसार कारवाई करण्यात येईल व दोषी व्यक्ती शिक्षेस पात्र होईल.

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

नमुना प्रश्न

Q. 201.   Tha Catch varies inversely with the size of the :

     (1)   nozzle   (2)   droplet

     (3)   obstruction   (4)   sprayer

ह्या प्रश्नाचे योग्य उत्तर ''(3) obstruction'' हे आहे. त्यामुळे या प्रश्नाचे उत्तर ''(3)'' होईल. आता प्र.क्र. 201 समोरील उत्तर-क्रमांक ''③'' चा कंस खालीलप्रमाणे पूर्णपणे छायांकित करुन दाखविणे आवश्यक आहे.

प्र.क्र. 201.   ①   ②   ●   ④

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

पर्यवेक्षकांच्या सूचनेविना हे पृष्ठ उलटू नये

कच्च्या कामासाठी जागा / **SPACE FOR ROUGH WORK**

1. Under ground dams are advocated under watershed development programmes, to :

    (1) prevent subsurface soil movement

    (2) control deep percolation losses

    (3) control surface runoff, to achieve water harvesting and to recharge subsurface permeable layers

    (4) improve moisture availability for cropping

2. Thermal conductivity of single grain is greater than thermal conductivity of bulk grain by :

    (1) 2 - 3 times

    (2) 3 - 4 times

    (3) 4 -5 times

    (4) 5 -6 times

3. Rough grading is done by the following equipments :

    (1) bulldozers, tractor-drawn carrier type scrapers, small scrapers etc.

    (2) tractor drawn land planes or wooden floats

    (3) wooden planks

    (4) tractor drawn sub-soiler

4. Tractor battery should be charged when specific gravity of electrolyte falls below _____ .

    (1) 2.22

    (2) 1.22

    (3) 2.0

    (4) 0.8

5. Surging is the one of the most effective method of :

    (1) Irrigation

    (2) Drainage

    (3) Drilling of Well

    (4) Well development

6. In drip irrigation the design criterion is generally based on emitter flow variation, for lateral line, of :

    (1) Less than 10%

    (2) Less than 20%

    (3) Less than 30%

    (4) Less than 40%

7. In potato planter _____ type of device is used to pick up the seed.

    (1) Picker wheel

    (2) Spoon wheel

    (3) Cage wheel

    (4) Star wheel

P.T.O.

8. Which of the following rain gauge do not produce a mass curve of rainfall as record :

   (1) tipping bucket type rain gauge   (2) weighing bucket type rain gauge

   (3) natural siphon type rain gauge   (4) symon's rain gauge

9. Which impurity should be doped in crystalline Silicon to form n-type semiconductor ?

   (1) Having holes

   (2) Having same number of electrons as semiconductor

   (3) Having surplus free electrons

   (4) Having deficit of free electrons

10. The calorific value of biogas (dung gas) is _____ .

    (1) $10 \ MJ/m^3$ (2) $15 \ MJ/m^3$ (3) $20 \ MJ/m^3$ (4) $30 \ MJ/m^3$

11. Drains are designed to lower and maintain the ground water :

    (1) above the crop root zone   (2) within the crop root zone

    (3) below the foliage of crop   (4) below the crop root zone

12. Biogas is a substitute for conventional engine fuels with little modification in engine and the petrol replacement of the order of _____ is possible using biogas.

    (1) 85%   (2) 95%   (3) 100%   (4) 75%

13. Specific Gravity of fully charged Lead Acid Battery is :

    (1) 1.700   (2) 1.560   (3) 1.420   (4) 1.280

14. Recent innovations in belt conveyor system for grain handling are except one of the following ?

    (1) Use of higher belt speeds (upto 4.5 m/s)

    (2) Use of steeper troughing angle (upto 45°)

    (3) Use of inclined belts to elevate grains, thereby eliminating the need for bucket elevators.

    (4) Use of horizontal belts to elevate grains, thereby eliminating the need for bucket elevators.

15. Specific gravity separator works on the principles of :

    (a) The characteristics of grains to flow down over an inclined surface

    (b) The floatation of particle due to upward movement of air

    (1) Principle (a) is applicable

    (2) Principle (b) is applicable

    (3) Principles (a) and (b) are not applicable

    (4) Principles (a) and (b) are applicable

16. Which of the following is a vertical axis type wind mill ?

    (1) Dutch type   (2) Sail type

    (3) Savonius   (4) None of the above

17. Indicate the form of droplets which is not used in Ultra Low Volume (ULV) spraying ?

    (1) Fine sprays   (2) Mists   (3) Aerosol   (4) Fog

18. Impervious core wall is provided in the embankment, when :

    (1) foundation material is of impervious nature

    (2) embankment material is of impervious nature

    (3) embankment material is pervious to water

    (4) embankment and foundation material impervious to water

19. What is the approximate maximum theoretical efficiency of the horizontal axis type wind machines ?

    (1) 10.5%   (2) 59.32%   (3) 38.76%   (4) 90.01%

20. When the pipes are connected in parallel, the total loss of head is _____.

    (1) same as in each pipe

    (2) equal to the reciprocal of the sum of loss of head in each pipe

    (3) equal to the sum of the loss of head in each pipe

    (4) none of the above

21. In-air oven drying method of grains, the required temperature is :

    (1) $160° \pm 5°C$ (2) $150° \pm 4°C$ (3) $140° \pm 3°C$ (4) $130° \pm 2°C$

P.T.O.

22. The depth of water table is obtained by :
    (1) Piezometer   (2) Observation well
    (3) Driven well   (4) All of above

23. Which of the following design involves the estimation of design runoff rate and flood volume ?
    (1) hydraulic design   (2) structural design
    (3) hydrologic design   (4) none of the above

24. Sediment yield is equal to :
    (1) sediment yield index/delivery ratio
    (2) delivery ratio × gross soil erosion
    (3) gross soil erosion/delivery ratio
    (4) none of the above

25. The width of border strip is not economical if it is less than :
    (1) 4 m   (2) 3 m   (3) 2 m   (4) 1 m

26. The size of the watershed should be selected depending upon the possibilities of developing it completely within a period of :
    (1) 1 - 2 years   (2) 2 - 3 years   (3) 3 - 5 years   (4) 5 - 7 years

27. The probable maximum precipitation at a basin or a station is :
    (1) the greatest rainfall for a given duration that is physically possible
    (2) an impossibly large rainfall of a given duration
    (3) a rainfall of a given duration that can occur with a return period of 1000 years
    (4) a rainfall of a given duration that has the maximum probability of occurrence

28. The dry bulb always registers the actual air temperature. But the wet bulb registers a temperature which is :
    (1) higher than dry bulb temperature.
    (2) lower than dry bulb temperature.
    (3) same as dry bulb temperature.
    (4) double than dry bulb temperature.

कच्च्या कामासाठी जागा / SPACE FOR ROUGH WORK

29. _____ per cent of the total rural population is available for doing farm work.

 (1) 30   (2) 40   (3) 35   (4) 45

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30. Tractor rear mounted cultivator used for seed bed preparation and inter row cultivation in black cotton soil is :

 (1) Duck foot cultivator   (2) Buck foot cultivator

 (3) Suck foot cultivator   (4) Bullock foot cultivator

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31. If magnitudes of x_1, x_2 and x_3 have return periods of 50, 75 and 100 years respectively. Which of the following statement is *true* ?

 (1) $x_1 < x_2 < x_3$ (2) $x_1 > x_2 > x_3$

 (3) $x_1 < x_2$ and $x_2 > x_3$ (4) $x_1 > x_2$ and $x_2 < x_3$

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32. Indicate the safe moisture level for harvesting the crop, reducing shedding and shattering losses in the field.

 (1) 3 - 5%   (2) 13 - 15%   (3) 23 - 25%   (4) 33 - 35%

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33. Percentage loss of paddy during harvest and post harvest period between field and the consumer is estimated as :

 (1) 10 to 25 per cent   (2) 25 to 30 per cent

 (3) 30 to 35 per cent   (4) 35 to 40 per cent

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34. In carburettor engine thermal efficiency varies between :

 (1) 45 to 52 per cent   (2) 38 to 45 per cent

 (3) 32 to 38 per cent   (4) 25 to 32 per cent

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35. Where it is feasible to grade the field to a true plane _____ method of land levelling is used :

 (1) profile   (2) plane

 (3) planinspection   (4) Contour-adjustment

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36. The oil pressure in the hydraulic pump of hydraulic system of tractor is :

 (1) 301 to 350 kg/cm^2 (2) 251 to 300 kg/cm^2

 (3) 201 to 250 kg/cm^2 (4) 150 to 200 kg/cm^2

P.T.O.

कच्च्या कामासाठी जागा / **SPACE FOR ROUGH WORK**

37. Drag devices are often capable of generating high torques and are ideal for some uses such as _____ .

(1) Water pumping

(2) Electricity generation

(3) Both (1) and (2)

(4) None of the above

38. Unsteady flow is that type of flow, in which :

(1) the velocity, pressure and density at a point changes with respect to time.

(2) the fluid characteristics like velocity, pressure, density etc., at a point do not change with time

(3) the velocity at any given time do not change with respect to space (i.e. length of direction of the flow)

(4) the fluid particles move along well defined paths or stream lines and all the stream lines are straight and parallel

39. Among following which one should be followed for the tractor after every 10 working hours ?

(1) Under dusty conditions, air cleaner oil is changed.

(2) Engine oil should be changed

(3) Transmission oil should be changed

(4) Tappet clearance should be examined and checked

40. A transformer having 1000 primary turns is connected to 250 V a.c. supply. For a secondary voltage of 400 V, what will be number of turns in secondary coil ?

(1) 1000　　　(2) 500　　　(3) 1600　　　(4) 3200

41. It is required to fill the tank of compression sprayer to _____ of its capacity.

(1) $\frac{1}{2}$　　　(2) $\frac{3}{4}$　　　(3) $\frac{2}{3}$　　　(4) $\frac{4}{5}$

42. Thermocol used for insulation of refrigerated room is made of :

(1) Foamed polysterene

(2) Cork

(3) Asbestos fibre

(4) Polyethylene

कच्च्या कामासाठी जागा / SPACE FOR ROUGH WORK

43. Rising limb of hydrograph is dependent on :
    (1) Storm and basin characteristics
    (2) Storm characteristics only
    (3) Basin characteristics only
    (4) None of the above

44. If direct runoff is 15 ha-cm and basin area is 0.5 sq. km, the excess rainfall will be :
    (1) 0.3 cm
    (2) 4.5 cm
    (3) 0.45 cm
    (4) 3.0 cm

45. The capacity of each compaftment (bucket) of tipping bucket type of rain gauge is :
    (1) 1 mm
    (2) 0.50 mm
    (3) 0.25 mm
    (4) 0.75 mm

46. Bel-fast truss is also sometimes known as :
    (1) steel truss
    (2) mansard truss
    (3) latticed roof truss
    (4) truncated truss

47. Grain property not used in cleaning of paddy is :
    (1) Size
    (2) Specific gravity
    (3) Weight
    (4) Strength

48. The Weir does not require corrections for end contractions :
    (1) Rectangular Weir
    (2) Cipoletti Weir
    (3) Triangular Weir
    (4) All of the above

49. The average field capacity of tractor mounted sugarcane planter is about _____ ha/hr.
    (1) 0.2
    (2) 0.5
    (3) 1
    (4) 0.8

50. _____ type of fertilizer metering mechanism is used on animal drawn seed cum fertilizer drill.
    (1) Pick up
    (2) Double run
    (3) Star wheel
    (4) Auger

51. The use of glass sheet cover(s) solar heating devices is for _____ .
    (1) Reflecting the sun light
    (2) Absorbing the heat
    (3) Preventing the loss of absorbed heat
    (4) All above

P.T.O.

52. The capacity of a screw conveyor is influenced by :
    (a)   Screw diameter
    (b)   Inclination of the screw
    (c)   Speed of blade
    (d)   Shaft diameter
    (1)   (a), (b) are only correct
    (2)   (a), (b), (c) and (d) are correct
    (3)   only (c) is correct
    (4)   (c), (d) are only correct

53. The size of the foundation should be determined on the basis of :
    (1)   Bearing pressure of the soil
    (2)   Tensile strength of the soil
    (3)   Crushing strength of the soil
    (4)   None of the above

54. The recommended air temperature for drying parboiled paddy in LSU dryer is :
    (1)   45°C
    (2)   85°C
    (3)   95°C
    (4)   75°C

55. The parboiling of paddy is a cumulative function of one of the following.
    (1)   moisture and temperature
    (2)   moisture, temperature and drying
    (3)   only steam heating
    (4)   moisture and drying

56. Construction of Nala bund facilitates :
    (1)   reclamation of gullied lands
    (2)   recharging of ground water
    (3)   reduction of soil erosion and thereby silting of natural water courses
    (4)   all the above

57. The earthen check dam, is being used extensively under watershed development programme in Maharashtra for enhancing ground water recharge, is :
    (1)   Cement weir
    (2)   Drop structure
    (3)   Nala bund
    (4)   Chute spillway

58. In EI_{30} index method of rainfall erosivity estimation, I_{30} stands for :
    (1)   threshold rainfall intensity of 30 mm/hr
    (2)   maximum rainfall intensity for 30 minute duration during the storm
    (3)   rainfall intensity at successive 30 minute interval during storm
    (4)   30 cm depth of rainfall

59. The benefit-cost ratio in watershed management works should be minimum of :

    (1) 1.1 : 1   (2) 1.2 : 1   (3) 2 : 1   (4) 1.5 : 1

60. By DAD analysis, the maximum average depth over an area due to one day storm is 60 cm. For the same area the maximum average depth for a 2-days storm can be expected to be :

    (1) < 60 cm   (2) ≥ 60 cm   (3) 60 cm   (4) 30 cm

61. Institute in India which developed sugarcane planters is :

    (1) I.I.T.   (2) N.D.D.B.   (3) C.F.T.R.I.   (4) I.I.S.R.

62. Oscillating type of hydraulic jump takes place when Froude number is in the range of :

    (1) 2.5 to 4.5   (2) 1.5 to 2.5   (3) 4.5 to 5.5   (4) 5.5 to 7.5

63. Which of the following is most desirable for earthen embankment ?

    (1) gravel + sand + clay   (2) gravel + fine sand

    (3) sand + clay   (4) clay

64. As per land use classification, class-III land is suitable for cultivation and demands :

    (1) occasional cultivation

    (2) no conservation measures

    (3) moderate conservation measures

    (4) intensive conservation measures

65. When the velocity is doubled, the soil erosive capacity as represented by the kinetic energy of the flowing water is increased about :

    (1) 2 times   (2) 4 times   (3) 6 times   (4) 10 times

66. For suspended load sampling, following type of sampler is used :

    (1) Basket type   (2) Slot or pit type

    (3) Pan or tray type   (4) Depth integrating type

P.T.O.

67. Heat can be transferred by except one of the following ways ?

    (1)   Conduction   (2)   Radiation   (3)   Convection   (4)   Proportion

68. In case of hydraulic design for non-steady state sub-surface drainage _____ formula is used.

    (1)   Glover-Dumm   (2)   Ernst   (3)   Hooghoudt   (4)   Kirkham

69. In rheology except one of the following parameters are used for expressing the mechanical behavior of the material ?

    (1)   Force   (2)   Deformation   (3)   Time   (4)   Porosity

70. In excavated farm pond, the side slope usually kept in firm soils is :

    (1)   1 : 1   (2)   1.5 : 1   (3)   2 : 1   (4)   1 : 2

71. When average annual rainfall and evaporation over land masses and oceans on the earth are considered :

    (1)   annual evaporation from land area is found to be same as annual rainfall

    (2)   more rainfall occurs over land area than evaporated back from the same area

    (3)   more rainfall on oceans than what is evaporated

    (4)   annual rainfall and annual evaporation over oceans are equal

72. Surplus weirs are generally used to protect breaching of :

    (1)   contour bund   (2)   graded bund

    (3)   terrace   (4)   diversion drain

73. The science of artificial application of water to the land, in accordance with the crop requirement throughout the crop period for full-fledged nourishment of the crops is called as :

    (1)   evaporation   (2)   runoff   (3)   rainfall   (4)   irrigation

74. During conditioning of wheat, moisture content is increased to 15 - 16 percent by soaking and then tempered in bins for :

    (1)   18 - 72 hours   (2)   2 - 10 hours

    (3)   10 - 20 hours   (4)   70 - 80 hours

75. The erosion control structure adopted for the non arable land is :

(1) contour bunds
(2) graded bunds
(3) trenches
(4) ponds

76. Engineering measures of erosion control for arable land become necessary, when land slopes are :

(1) more than 2%
(2) more than 3%
(3) more than 5%
(4) more than 10%

77. In the drum or roller dryer the food is coated as a thin paste over the surface of a slowly revolving heated cylinder in one of the following positions ?

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

78. If temperature and pH are favourable a Carbon-Nitrogen (C/N) ratio of which range will permit optimum digestion in biogas plant ?

(1) 10
(2) 5
(3) 50
(4) 30

79. A queen post truss is suitable for roof of spans varying from _____ .

(1) 10 to 15 meters
(2) 05 to 10 meters
(3) 08 to 12 meters
(4) 05 to 15 meters

80. Which of the following is *not* a basic element of a transformer ?

(1) Core
(2) Secondary winding
(3) Primary winding
(4) Mutual flux

81. L_1, L_2, L_3 are the length of three pipes, connected in series. If d_1, d_2 and d_3 are their diameter, then the equivalent size of the pipe is given by :

(1) $\dfrac{L}{d^5} = \dfrac{L_1}{d_1^5} + \dfrac{L_2}{d_2^5} + \dfrac{L_3}{d_3^5}$

(2) $\dfrac{d^5}{L} = \dfrac{d_1^3}{L_1} + \dfrac{d_2^3}{L_2} + \dfrac{d_3^3}{L_3}$

(3) $Ld^5 = L_1 d_2^5 + L_2 d_2^5 + L_3 d_2^5$

(4) $Ld^5 = L_1 d_3^5 + L_2 d_3^5 + L_3 d_3^5$

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82. Efficient irrigation by the Furrow method is obtained by selecting proper combination of :
    (1) spacing and length only
    (2) slope of furrows and suitable size of irrigation stream only
    (3) length and duration of water application only
    (4) spacing, length and slope of furrows and suitable size of irrigation stream and duration of water application

83. Indicate which is not a sprayer in this group.
    (1) Hand atomizer
    (2) Engine powered sprayer
    (3) Air plane sprayer
    (4) Orient sprayer

84. For conveying grains on a belt conveyor, recommended speed of its belt is :
    (1) 2.5 - 2.8 m/s　(2) 3 - 3.5 m/s　(3) 4 - 4.5 m/s　(4) 0.5 - 1 m/s

85. In terms of power output one can expect how much kW per animal ?
    (1) 0.3 to 0.6　(2) 0.7 to 1.0　(3) 1.1 to 1.4　(4) 1.5 to 1.8

86. What is the standard value of the solar constant _____ .
    (1) 1000 W/m^2
    (2) 2000 W/m^2
    (3) 1353 W/m^2
    (4) 1857 W/m^2

87. Cold storages are used to maintain the fruits at :
    (1) Low temperature
    (2) Low humidity
    (3) High temperature
    (4) High humidity

88. The milk house is generally placed away from the dairy barn at about :
    (1) 4 m　(2) 2 m　(3) 6 m　(4) 8 m

89. The most important factor affecting the terminal velocity of a spray droplet is :
    (1) droplet size
    (2) droplet density
    (3) droplet volume
    (4) droplet frequency

90. Among the methods of sedimentation control in reservoirs, which method is comparatively expensive and situation oriented ?

   (1) Construction of vegetation screens

   (2) Control of sediment inflow

   (3) Removal of sediment deposit

   (4) erosion control in the catchment

91. If the wind speed is increased twice then the power available will increase how many times ?

   (1) 8 times   (2) 20 times   (3) 16 times   (4) 32 times

92. A minimum furrow grade of _____ per cent is needed to ensure surface drainage.

   (1) 0.01   (2) 0.03   (3) 0.05   (4) 0.10

93. An area is classified as a drought prone area if the probability 'p' of occurrence of a drought is :

   (1) $0.4 < p \leq 1.0$ (2) $0.2 \leq p \leq 0.4$ (3) $0.1 \leq p < 0.2$ (4) $0.0 < p < 0.20$

94. The mass curve of rainfall is drawn as a plot of :

   (1) Rainfall intensity Vs time

   (2) Accumulated rainfall intensity Vs time

   (3) Accumulated rainfall Vs time in chronological order

   (4) Rainfall volume Vs time

95. In essential tests under tractor testing there are number of tests except one among following ?

   (1) Engine test   (2) Drawbar test

   (3) Centre of gravity   (4) Noise measurement

96. Bucket elevator with a belt carrier can be used at a high speed of :

   (1) 2.5 to 4.0 m/sec   (2) 5.0 to 8.0 m/sec

   (3) 7.5 to 12.0 m/sec   (4) 10.0 to 16.0 m/sec

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97. Which one of the following is not a positive displacement pump ?

    (1) Reciprocating piston pump   (2) Gear pump

    (3) Rotary pump   (4) Centrifugal pump

---

98. Soil erodibility factor 'K' is higher in :

    (1) Sandy soils   (2) Clayey soils

    (3) Silt clay soils   (4) Loamy soils

---

99. Road speed of farm tractor for transport work is :

    (1) 19 to 24 kmph   (2) 25 to 30 kmph   (3) 31 to 36 kmph   (4) 37 to 42 kmph

---

100. In thin layer drying grain bed thickness is :

    (1) 20 cm   (2) 40 cm   (3) 60 cm   (4) 80 cm

---

101. Rice milling machinery having the highest shelling efficiency is :

    (1) Under runner disc sheller   (2) Rubber roll sheller

    (3) Huller   (4) Centrifugal dehusker

---

102. The practical unit of electrical energy is _____ .

    (1) Joules-second   (2) Watt-second

    (3) Kilowatt-hour   (4) Watt-hour

---

103. The equipment used for land grading is :

    (1) M.B. Plough   (2) Disc Plough   (3) Buck Scraper   (4) Cultivator

---

104. Diversion ditches provided for protection of cultivated land, are generally planned :

    (1) along the slope at the upstream of protected land

    (2) across the slope at the upstream of protected land

    (3) at the field boundary irrespective of slope direction

    (4) across the slope at the downstream of protected land

---

105. Which one of the following is not a principal part of a Sprayer Nozzle ?

    (1) Body   (2) Washer

    (3) Disk   (4) Single or double acting pump

---

106. The catchment area for Nala bunding should be :

(1) greater than 1000 ha. (2) 750 to 1000 ha.

(3) 500 to 750 ha. (4) 80 to 500 ha.

---

107. The number of gangs of discs in tandem harrow is :

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

---

108. If the major part or the entire ponding of water is achieved by a raised crest and a smaller part or nil part is achieved by the shutters, then the barrier is known as _____.

(1) River regulator (2) Barrage

(3) Weir (4) None of these

---

109. The type of truss commonly used for spans varying from 5 to 8 meter is :

(1) queen post truss (2) king post truss

(3) composite truss (4) mansard truss

---

110. For clay type of soil the drainable porosity is _____ :

(1) more than porosity (2) less than porosity

(3) zero (4) equal to hydraulic conductivity

---

111. Which form of erosion is most serious in India ?

(1) Rill (2) Gully (3) Sheet (4) Splash

---

112. KVIC digester design, which is patented by KVIC India under the name _____ .

(1) Janata (2) Grah Laxmi (3) Pragati (4) Din Bandhu

---

113. Porosity of grains depend upon following except one ?

(1) Shape (2) Dimensions

(3) Roughness (4) Colour

---

114. In case of two point sampling the sediment observations are recorded from :

(1) 0.4 d and 0.6 d (2) 0.3 d and 0.7 d

(3) 0.2 d and 0.8 d (4) 0.1 d and 0.9 d

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115. Aquifers, ground water reservoir or water bearing formations are the :

    (1) formations or strata within the unsaturated zone below ground surface

    (2) formations or strata within the unsaturated zone above the ground surface

    (3) formations or strata within the saturated zone below the ground surface

    (4) formation or strata within the saturated zone above the ground surface

116. If the delta for a crop is 1.2 m and the base period of crop is from June to September, then its duty will be _____ hectare/cumec.

    (1) 748.7   (2) 784.8   (3) 846.5   (4) 878.4

117. For efficient photo-voltaic cell, it is desirable to have high values of :

    (1) Fill factor   (2) Short circuit current

    (3) Open circuit voltage   (4) All of the above

118. Spark ignition engine works on the principle of _____ cycle.

    (1) otto   (2) petrol   (3) diesel   (4) gas

119. The return period of one day maximum rainfall of magnitude equal to or greater than 'x' is 10 years means :

    (1) In a long period of 100 years, 10 such events can be expected

    (2) That every 10 years, the event would definitely occur

    (3) Such events are likely twice in 10 years

    (4) None of the above

120. Contents of fruit and vegetables are retained more in :

    (1) Tray drying method   (2) Tunnel drying method

    (3) Sun drying method   (4) Freeze drying method

121. In a combine harvester the normal ratio of peripheral speed to forward speed (reel speed index) is :

    (1) 2 to 2.5   (2) 2.5 to 3   (3) 1.25 to 1.5   (4) 3.5 to 4

122. In diesel engine, the torque is considerably high at lower than rated speed this behavior is called _____ .

    (1) rising ability (2) gearing ability (3) lugging ability (4) traction ability

123. For a hilly terrain region the green house recommended is :

    (1) Lean to type green house (2) Even span type green house

    (3) Uneven span type green house (4) Quonset green house

124. Purpose of providing very flat sides in broad base terraces is :

    (1) to increase spacing of terraces, thereby achieving economy

    (2) to increase carrying capacity of terrace channel

    (3) to facilitate agricultural operations

    (4) to improve soil deposition

125. To increase the spray angle of nozzle spray pattern, it is required :

    (a) to increase orifice diameter

    (b) to increase pressure

    (c) to reduce opening of swirl plate

    (1) (a) and (b) are correct only

    (2) (a), (b) and (c) all are correct

    (3) (b) and (c) are correct only

    (4) (a), (b) and (c) are incorrect

126. The volume of water the aquifer releases from or take into storage per unit surface area of the aquifer per unit change in the component of head normal to the surface is called as :

    (1) coefficient of storage (s) (2) specific yield

    (3) transmissibility (4) leakage factor

127. The power duster of a small capacity does not consist of one of the following :

    (1) Blower (2) High speed Engine

    (3) Discharge Hose pipe (4) Hand Automizer

P.T.O.

128. In rational method, 'I' represents :

    (1)   average rate of rainfall

    (2)   one hour intensity of rainfall

    (3)   intensity of rainfall for a duration at least equal to the time of concentration

    (4)   none of the above

129. Dryer used to remove water from solutions or suspensions is :

    (1)   Solar dryer   (2)   Rotary dryer

    (3)   Spray dryer   (4)   Batch dryer

130. _____ is the amount of forward travel per cut by the rotary tiller.

    (1)   Byte length   (2)   Cut length

    (3)   Bite length   (4)   Effective length

131. For the purpose of starting an induction motor a star-delta switch is equivalent to an auto-starter of ratio _____ per cent.

    (1)   33.3   (2)   73.2   (3)   57.7   (4)   60

132. The erodibility index of a soil having 20% sand, 40% silt and 60% clay is :

    (1)   1   (2)   1.5   (3)   2   (4)   2.5

133. The factors affecting drawbar performance are :

    (a)   total weight

    (b)   centre of gravity

    (c)   condition of traction surface

    (d)   travel speed

    (1)   (a), (b), (c) and (d) all are correct

    (2)   (a), (b), (c) correct and (d) incorrect

    (3)   only (d) is correct

    (4)   (b), (c) correct and (a), (d) incorrect

134. Which of the following is different from the rest ?

    (1)   rain   (2)   drizzle   (3)   hail   (4)   fog

135. An isohyte is a line joining points having :

   (1)   equal evaporation values

   (2)   equal heights above mean sea level

   (3)   equal rainfall intensity

   (4)   equal rainfall magnitude

136. For gully erosion control, long and narrow medium size gullies are controlled with :

   (1)   diversion structures at gully head

   (2)   permanent and semi-permanent check dams

   (3)   tillage operations

   (4)   filling with soil

137. One of the following is not a part of single effect Evaporator :

   (1)   Heat Exchanger   (2)   Condenser

   (3)   Separator   (4)   Concentrator

138. Under watershed development programme, primary objective of planning trenches on non-arable hill slopes is to :

   (1)   control soil erosion and land slide

   (2)   conserve moisture for afforestation

   (3)   break the length of slope and remove runoff safely

   (4)   to engage personnel under EGS

139. An impervious stratum within the zone of aeration interrupts percolation and causes ground water to accumulate in a limited area above that stratum. Such type of geological formation is known as :

   (1)   Confined aquifer   (2)   Unconfined aquifer

   (3)   Perched water table   (4)   Aquiclude

140. Separator which separates material on the basis of shape and surface texture is :

   (1)   Disc separator   (2)   Inclined draper

   (3)   Spiral separator   (4)   Cyclone separator

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141. The capacity of Rotary dryer for drying parboiled paddy introduced by Jadavpur University (Calcutta) is :

(1)   1 Tonne/hr   (2)   2 Tonnes/hr

(3)   3 Tonnes/ hr   (4)   4 Tonnes/hr

142. The most efficient cross section for an open channel is :

(1)   Semi circle   (2)   Rectangular   (3)   Trapezoidal   (4)   Triangular

143. Generally head water flood control reservoirs, used for automatic regulating the excess of design flood, are of type :

(1)   storage reservoirs   (2)   detention reservoirs

(3)   multipurpose reservoirs   (4)   water harvesting reservoirs

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

(1)   C. C. A.   (2)   G. C. A.   (3)   I. I.   (4)   None of above

145. Air cleaner used in Farm engines is :

(1)   Oil bath type   (2)   Hit and miss type

(3)   Pre-cleaner type   (4)   Swimming type

146. The common application of pasteurization is to one of the following liquids ?

(1)   Milk   (2)   Butter-milk   (3)   Water   (4)   Honey

147. In USLE, the most sensitive factor causing soil loss is :

(1)   R   (2)   K   (3)   LS   (4)   C

148. Mechanical cotton picker cannot act as a device :

(1)   to remove the cotton from the open bolls

(2)   to remove cotton from unopened bolls

(3)   to convey picked cotton

(4)   to store picked cotton

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149. The bearing capacity of a soil depends upon :

(1) grain size of the soil   (2) size of the footing

(3) shape of the footing   (4) all of the above

---

150. 1 darcy = _____

(1) 0.876 $(\mu m)^2$ (2) 0.789 $(\mu m)^2$ (3) 0.987 $(\mu m)^2$ (4) none of these

---

151. At the time of physio-logical maturity of the plant, the food grains hold moisture content to the tune of :

(1) 12-15%   (2) 16-18%   (3) 20-25%   (4) 25-30%

---

152. Under single cropping pattern, it is normally recommended to consider _____ HP for every two hectares.

(1) 2   (2) 2.5   (3) 3   (4) 1

---

153. A tillage implement (or tool) moving at a constant velocity is subjected to following main forces except one which must be in equilibrium ?

(1) Force of gravity acting upon the implement.

(2) The soil forces acting upon the implement .

(3) The forces acting between the implement and the prime mover.

(4) Forces of wind velocity acting upon the implement.

---

154. A hyetograph is drawn as a plot of :

(1) Run off discharge Vs time   (2) Rainfall Volume Vs time

(3) Rainfall intensity Vs time interval   (4) Cumulative rainfall Vs time

---

155. For average condition of grass cover and channel section, the flow velocity used for design purposes is :

(1) 0.9 to 1.5 m/s   (2) 1.5 to 2.0 m/s   (3) 2.0 to 2.5 m/s   (4) 2.5 to 3.0 m/s

---

156. The middle third rule is used in the design of headwall in drop structures to withstand against failure by :

(1) overturning   (2) tensile forces   (3) sliding   (4) crushing

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---

157. _____ method of irrigation to soils is having moderately low to moderately high infiltration rates.

   (1)   Check basin   (2)   Border

   (3)   Furrow   (4)   None of above

158. What will be the amount of fertilizer to be applied at each setting when a lateral has 12 sprinklers spaced at 10 m apart, the lateral spacing is 18 m and the fertilizer dose is .120 kg/ha ?

   (1)   25.92 kg/setting   (2)   26.92 kg/setting

   (3)   27.92 kg/setting   (4)   28.92 kg/setting

159. During milk processing homogenization of milk is carried out :

   (1)   To kill the bacteria   (2)   To preserve the quality

   (3)   To break fat globules   (4)   None of the above

160. The advantages of solar concentrator system over flat plate type collectors :

   (1)   Reflecting surfaces require less material and are structurally simpler.

   (2)   The working fluid can attain higher temperatures.

   (3)   Uniform flux as the absorber.

   (4)   Both (1) and (2).

161. When leaching is required to remove salts from the soil profile the _____ irrigation method is used.

   (1)   Border   (2)   Check basin   (3)   Furrow   (4)   Sprinkler

162. The wall that can support the ceiling as well as its own load have thickness of :

   (1)   22.5 cm   (2)   37.5 cm   (3)   32.5 cm   (4)   22.00 cm

163. Working width of 5 row 20cm. spacing paddy transplanter is :

   (1)   0.4 m   (2)   0.6 m   (3)   0.8 m   (4)   1.0 m

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164. Depending upon the seed metering device, seed drills may be classified as except one of the following ?
    (1) Manually metered drills
    (2) Mechanically metered drills
    (3) Pneumatically metered drills
    (4) Electronically metered drills

165. The tilt angle of the disc plough is _____ .
    (1) 5° to 10°   (2) 15° to 25°   (3) 30° to 40°   (4) 40° to 45°

166. To control the flying insects droplet size required is _____ micron metre.
    (1) 50 to 100   (2) 125 to 150   (3) 10 to 50   (4) 150 to 200

167. While calculating the optimum number of rain gauge stations in a watershed, the allowable error for estimation of rainfall is generally taken as :
    (1) 8%   (2) 10%   (3) 4%   (4) 20%

168. The coding of watershed should be started from :
    (1) middle of watershed towards lower end
    (2) downstream end and proceeded to upstream end
    (3) upstream end and proceeded to downstream end
    (4) none of the above

169. What is the name for the contours of constant wind power (Watts/m^2 of area perpendicular to wind flow) ?
    (1) Isohytes   (2) Isobars   (3) Isodynes   (4) Iso octane

170. For the reclamation of Alkali soil the suitable salt is soluble :
    (1) Sodium   (2) Calcium
    (3) Sodium bicarbonate   (4) None of the above

171. Draft of a plough is measured in :
    (1) kg   (2) kg/Sq.cm   (3) Sq.cm   (4) Hectares

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172. In three point hitch system _____ links are in tension.

    (1) one   (2) three   (3) two   (4) four

173. Percolation tanks, constructed and maintained under minor irrigation projects, act functionally similar to :

    (1) cement concrete gully control check dam

    (2) water harvesting concrete weirs

    (3) gabion type gully control check dams

    (4) Nala bunds

174. Movement of soil particles move by bouncing along the bed is termed as :

    (1) Saltation   (2) Suspension   (3) Surface creep   (4) Bed load

175. Gully cuts the 'C' horizon in development stage number :

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

176. The priority of subwatershed for treatment is decided on the basis of :

    (1) productivity   (2) sediment yield

    (3) vegetation   (4) area of subwatershed

177. An opening made in a wall for the purpose of providing day light, vision and ventilation is known as :

    (1) door   (2) open wall   (3) window   (4) none of these

178. How much quantity of biogas is roughly required to run a one horse power engine for 2 hours ?

    (1) 0.01 cu.m   (2) 0.10 cu.m   (3) 1 cu.m   (4) 10 cu.m

179. Contour farming is most effective to control erosion on land slopes of :

    (1) 1 to 3%   (2) 3 to 7%   (3) 7 to 12%   (4) > 12%

180. In system terminology the input of unit hydrograph is :

    (1) base flow   (2) rainfall excess

    (3) rainfall depth   (4) rainfall intensity

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181. Which one of the following does not affect the draft of plough ?

    (1)   Tillage treatments   (2)   Manures applied

    (3)   Crop residue left in the soil   (4)   Spraying to previous crop

182. Freeze dried operations are performed under a predetermined pressure of a few hundred microns between temperature of :

    (1) $-5°$ to $30°C$ (2) $-10°$ to $40°C$

    (3) $-15°$ to $45°C$ (4)   None of these

183. In variable grade given to a graded bund, the maximum grade is kept at :

    (1)   upper end of the bund   (2)   middle portion of the bund

    (3)   out let end of the bund   (4)   whole length of the bund

184. Runoff samples are collected by :

    (1)   stage level recorder   (2)   H - flume

    (3)   V - notch   (4)   multislot diviser

185. No load test on transformer is carried out to determine :

    (1)   Copper loss

    (2)   Magnetizing current

    (3)   Magnetizing current and no load loss

    (4)   Efficiency of transformer

186. All watershed development works should start from :

    (1)   upper reaches of the watershed

    (2)   middle reaches of the watershed

    (3)   lower reaches of the watershed

    (4)   none of the above

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187. Small watersheds are characterized by :

(1) overland flow dominating channel flow

(2) land use affecting overland flow

(3) channel characteristics affecting overland flow

(4) base flow dominating channel flow

188. A property of agricultural product which is necessary to design air separating system is :

(1) Hydrodynamic properties   (2) Aerodynamic properties

(3) Physical properties   (4) Thermal properties

189. Safe level of moisture in grains is required for preservation of :

(a) quantity

(b) quality

(c) nutritive value

(d) viability

(1) (a) and (b) are correct   (2) (a), (b) and (c) are correct

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

190. Pick up the *wrong* statement from the following :

(1) Transport of sediment particles by rolling along the bed is known as saltation

(2) Trap efficiency of the reservoir decreases with increase in capacity-inflow ratio

(3) A bed load at one section may move as suspended load at another section

(4) Deposition of coarse sediments takes place at the entrance to the reservoir.

191. Pusa bin is a moisture free bin made of _____ .

(1) Burnt bricks   (2) Unburnt bricks (3) Stone blocks   (4) Cement blocks

192. Roller milling system of wheat is divided into break roll system and _____ .

(1) Reduction roll system   (2) Single roll system

(3) Double roll system   (4) Rubber roll system

193. Mangers used in dairy barns should have widths ranging between _____ .

(1) 60 to 75 cm   (2) 90 to 115 cm

(3) 75 to 90 cm   (4) None of these

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194. Among the theories of moisture movement phenomena in cereal grains, which one of the following is not popular ?

(1) Light diffusion   (2) Surface diffusion

(3) Vapour diffusion   (4) Thermal diffusion

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195. The minimum thickness of the filter material placed around the tile drain should be :

(1) 5 cm   (2) 7.5 cm   (3) 10 cm   (4) 12.5 cm

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196. During pasteurization milk is held in HTST pasteurizer for 15 seconds at a temperature of :

(1) 71°C   (2) 55°C   (3) 61°C   (4) 78°C

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197. Type of furrow opener suitable for hard soil, trashy field and wet sticky soil is :

(1) Double disc type   (2) Single disc type

(3) Inverted T-type   (4) Shovel type

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198. Modern rice milling machinery is developed in Europe and in _____ .

(1) India   (2) China   (3) U.S.A.   (4) Japan

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199. Terminal velocity for soyabean is :

(1) 11.3 m/sec   (2) 22.3 m/sec   (3) 33.3 m/sec   (4) 44.3 m/sec

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200. In carburettor, the choke controls the volume of _____ entering into the venturi.

(1) petrol   (2) mixture of air and petrol

(3) diesel   (4) air

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