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T. B. C. : AAE – 1/22

Test Booklet Series

A

TEST BOOKLET

Sl. No. 1057

ASSISTANT AGRICULTURE ENGINEER

PAPER – I

Time Allowed : 2 Hours | *Maximum Marks : 100*

: INSTRUCTIONS TO CANDIDATES :

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET OF THE SAME SERIES ISSUED TO YOU.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C** OR **D**, AS THE CASE MAY BE, IN THE APPROPRIATE PLACE IN THE ANSWER SHEET USING BALL POINT PEN (BLUE OR BLACK).
3. You have to enter your **Roll No.** on the Test Booklet in the Box provided alongside. **DO NOT** write *anything else* on the Test Booklet.
4. **YOU ARE REQUIRED TO FILL UP & DARKEN ROLL NO., TEST BOOKLET / QUESTION BOOKLET SERIES IN THE ANSWER SHEET AS WELL AS FILL UP TEST BOOKLET / QUESTION BOOKLET SERIES AND SERIAL NO. AND ANSWER SHEET SERIAL NO. IN THE ATTENDANCE SHEET CAREFULLY. WRONGLY FILLED UP ANSWER SHEETS ARE LIABLE FOR REJECTION AT THE RISK OF THE CANDIDATE.**
5. This Test Booklet contains **100** items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose **ONLY ONE** response (answer) for each item (question).
6. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided, by **using BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
7. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. For each wrong response (answer), 0.25 marks shall be deducted from the marks awarded for correct answers.
8. Before you proceed to mark (darken) in the Answer Sheet the responses (answers) to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions sent to you with your **Admission Certificate**.
9. After you have completed filling in all your responses (answers) on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *Answer Sheet* issued to you. You are allowed to take with you the candidate's copy / second page of the Answer Sheet along with the **Test Booklet**, after completion of the examination, for your reference.
10. Sheets for rough work are appended in the Test Booklet at the end.

SEAL

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1. Which of the following is not considered a datatype in computer programming ?

(A) Symbolic Data

(B) Numeric Data

(C) Alphanumeric Data

(D) Alphabetic Data

2. What does GUI stand for ?

(A) Ground User Interface

(B) Graphical User Instruction

(C) General User Instruction

(D) Graphical User Interface

3. Which of the statement is most suitable for taking a decision based on multiple choices ?

(A) if

(B) if-else

(C) if-else-if

(D) All of these

4. Which of the following is a collection of different types of data ?

(A) String

(B) Structure

(C) Char

(D) All of these

5. The lathe bed is usually manufactured with the following material :

(A) Cast iron

(B) Wrought iron

(C) Stainless steel

(D) High carbon steel

6. The endpoint of the drill bit is _____ in shape.

(A) circular

(B) semi-circular

(C) flat

(D) conical

7. The _____ machine is superior to other machines as mentioned below in terms of accuracy and surface finish.

(A) Lathe machine

(B) Milling machine

(C) Slotting machine

(D) Shaping machine

8. The length of stroke for a shaper machine is 210 mm, the number of double strokes per minute is 28 and the ratio of return time to cutting time is 2 : 3, then its approximate cutting speed is :

(A) 6.50 m/min

(B) 9.80 m/min

(C) 11.25 m/min

(D) None of these

9. Which of the following diodes is a four-layer (P-N-P-N) with two terminals (namely anode and cathode) ?

(A) Tunnel diode

(B) Light emitting diode

(C) Zener diode

(D) Shockley diode

10. LVDT is a common type of electromechanical transducer. What does LVDT stand for ?

(A) Linear Virtual Differential Transducer

(B) Linear Virtual Double Transformer

(C) Linear Variable Differential Transformer

(D) Linear Variable Differential Transducer

11. What is the value of absolute zero temperature ?

(A) $0^{\circ}C$

(B) $100^{\circ}C$

(C) $-273^{\circ}C$

(D) None of these

12. Which of the following can be used as mechanical pressure sensing element ?

(A) Diaphragm

(B) Bellows

(C) Bourdon tube

(D) U-tube

13. The Golden Revolution is related to the production of :

(A) Milk

(B) Cotton and jute

(C) Grain and pulses

(D) Horticulture and honey

14. How much percent of the GDP in Odisha comes from the Agriculture Sector in the year 2021-22 ?

(A) 17%

(B) 21%

(C) 28%

(D) 35%

15. Animal Disease Research Institute (ADRI) is situated in which place in Odisha ?

(A) Brahmagiri

(B) Phulnakhara

(C) Ranpur

(D) Chandrapur

16. Which one of the below is announced by the Government of India to support a crop ?

(A) Minimum support price

(B) Maximum support price

(C) Moderate support price

(D) Influential support price

17. Which of the following is a Kharif Crop ?

(A) Paddy

(B) Maize

(C) Jowar

(D) All of these

18. How many joules contain one watt-hour ?

(A) 3.6×10^8 J

(B) 3.6×10^2 J

(C) 3.6×10^3 J

(D) 10^{-3} J

19. What is the term used for an imaginary line on the ground joining points of equal elevation ?

(A) Level line

(B) Contour

(C) Line of sight

(D) Datum

20. Which of the physical quantity has the same dimensional formula as that of energy ?

(A) Work done

(B) Pressure

(C) Force

(D) Power

21. Which surveying instrument is used for marking the position of stations, and for sightings of those stations, as well as for ranging straight lines ?

(A) Arrow

(B) Peg

(C) Ranging rod

(D) All of these

22. What is the shrinkage factor if the area of a plan of an old survey plotted on a sheet shrunk from 10 cm to 9.8 cm in length ?

(A) 0.098

(B) 0.98

(C) 9.8

(D) None of these

23. How many links are in a Revenue chain ?

(A) 10

(B) 12

(C) 16

(D) 19

24. What is the length of the survey chain ?

(A) 15 m

(B) 20 m

(C) 25 m

(D) 30 m

25. The greenhouse built against the side of an existing building structure is known as :

(A) Even span type greenhouse

(B) Uneven span type greenhouse

(C) Lean to type greenhouse

(D) Ground to ground greenhouse

26. Which of the following pairs of gases are the main contributors to the greenhouse effect ?

(A) Ozone and Ammonia

(B) Oxygen and Nitrogen

(C) Carbon dioxide and Methane

(D) Nitrogen and Sulphur dioxide

27. The process of adding water to calcium oxide to produce calcium hydroxide is referred to as :

(A) Watering

(B) Slaking

(C) Baking

(D) Soaking

28. The greenhouse effect is related to :

(A) Global warming

(B) Increased growth of green algae

(C) Cultivation of vegetables in the house

(D) Development of terrace gardens

29. The anthropogenic CO_2 emission is related to _____ emissions.

(A) Industrial CO_2

(B) Natural CO_2

(C) Human-made CO_2

(D) None of these

30. Which one is the most abundant greenhouse gas in the Earth's atmosphere ?

(A) Nitrous oxide

(B) Carbon dioxide

(C) Water vapour

(D) Methane

31. The seed rate of the seed metering mechanism does not depend upon :

(A) Speed of operation

(B) Types of seeds

(C) Types of the metering mechanisms

(D) Number of furrow openers

32. Quality of work for performance evaluation of tillage implement does not depend on :

(A) Depth of cut

(B) Width of cut

(C) Soil inversion

(D) Soil pulverization

33. The centre of resistance lies at a distance equal to _____ from the share wing.

(A) 3/4th size of tractor

(B) 3/4th size of plow

(C) 3/4th size of share

(D) 3/4th size of frog

34. Vertical Conveyor Reaper (VCR) is most popular for harvesting of :

(A) Grass

(B) Paddy

(C) Vegetable crops

(D) All of these

35. The disk plow is forced into the ground by the effect of :

(A) Gravity

(B) Suction

(C) Direction of travel

(D) Both (A) and (B)

36. The specific gravity of electrolyte can be checked with :

(A) Hygrometer

(B) Hydrometer

(C) Voltmeter

(D) Multimeter

37. The sticky belt method is associated with the :

(A) Testing of seed uniformity

(B) Testing of seed rate

(C) Power consumption of seed drill

(D) Both (A) and (B)

38. The tank capacity of the knapsack sprayer is about :

(A) 5-10 litres

(B) 5-15 litres

(C) 10-23 litres

(D) 10-33 litres

39. What is the main objective of puddling ?

(A) Destroy insects and pests

(B) Mix the fertilizer in the soil

(C) Reduce the soil erosion

(D) Decrease water loss by percolation

40. The power available at the engine crankshaft which is measured by a suitable dynamo meter is called :

(A) Brake power

(B) Indicated power

(C) Friction power

(D) Drawbar power

41. In a tractor engine, the complete path of power from the engine to the wheels is called :

(A) Transmission path

(B) Power wheel

(C) Power train

(D) Hitch system

42. A turbocharger is a centrifugal compressor driven by _____ and employed in engines to boost the charge air pressure.

(A) Engine

(B) Exhaust gas

(C) Dynamo

(D) PTO

43. The average speed of the engine connected to the governor is 1000 rpm. If the fluctuation in speed is ±100 rpm, then % governor regulation is about :

(A) 15%

(B) 17%

(C) 20%

(D) None of these

44. The Cetane rating, also known as Cetane number is a measurement of :

(A) Ignition quality of fuel

(B) Calorific value of fuel

(C) Viscosity of fuel

(D) Specific gravity of fuel

45. Which are the main constituents of fuel ?

(A) Oxygen and Hydrogen

(B) Oxygen and Nitrogen

(C) Carbon and Nitrogen

(D) Carbon and Hydrogen

46. When the crankshaft rotates, which part does the job of splashing oil from the oil sump to the cylinder walls ?

(A) Spoon

(B) Dipper

(C) Hooper

(D) Scooper

47. What is the thickness of the cylinder wall if the diameter of the cylinder bore is 150 mm ?

(A) 7.15 mm

(B) 7.62 mm

(C) 8.35 mm

(D) 8.80 mm

48. Water circulation is a radiator of a water cooling system takes place from :

(A) Upper tank to lower tank

(B) Lower tank to upper tank

(C) Engine to upper tank

(D) Engine to water pump

49. The basic purpose of the ignition coil in the ignition systems of a petrol engine is used to :

(A) Step-up current

(B) Step-down current

(C) Step-up voltage

(D) Step-down voltage

50. What is the firing order of 4 cylinders 4-stroke vertical engine ?

(A) 1 – 2 – 3 – 4

(B) 1 – 3 – 4 – 2

(C) 3 – 4 – 1 – 2

(D) 4 – 3 – 2 – 1

51. The towed force (T_F) of a pneumatic tire is given by (symbols have their usual meanings) :

(A) $T_F = 1.2 / C_n + 0.046$

(B) $T_F = 1.2 / C_n + 0.04$

(C) $T_F / W = 1.2 / C_n + 0.04$

(D) $T_F = 1.2 / W + 0.04 \times C_n$

52. Moving the center of gravity of a tractor towards its front wheel creates the problem of :

(A) Instability

(B) Steering

(C) Overturning

(D) All of these

53. What is the purpose of ballasting in the front tires of a tractor ?

(A) Increase traction

(B) Decrease front wheel slippage

(C) Increase stability

(D) Decrease tractor vibration

54. Drawbar power can be also expressed as (symbols have their usual meanings) :

(A) $\frac{GTR}{NTR} \times (1 + s) \times AHP$

(B) $\frac{GTR}{NTR} \times (1 - s) \times AHP$

(C) $\frac{NTR}{GTR} \times (1 - s) \times AHP$

(D) $\frac{NTR}{GTR} \times (1 + s) \times AHP$

55. The horizontal component of pull perpendicular to the direction of travel is :

(A) Pull

(B) Draft

(C) Unit draft

(D) Side draft

56. A tractor has a rear wheel of diameter 1.5 meters, the final drive gear ratio is 5 : 1, the differential gear ratio is 3 : 1 and the gearbox reduction is 2 : 1. Find the travel speed of the tractor when the speed of the engine is 1250 rpm and transmission efficiency is 86% :

(A) 10.13 kmph

(B) 11.77 kmph

(C) 13.68 kmph

(D) None of these

57. The relationship between Theoretical Field Capacity (TFC), Effective Field Capacity (EFC), and Field Efficiency (FE) of a machine is given by :

(A) FE (%) = (EFC / TFC) × 100

(B) FE (%) = (TFC / EFC) × 100

(C) FE (%) = (EFC × TFC) / 100

(D) FE (%) = (EFC – TFC) / 100

58. The basic difference between seed planter and seed drill is in respect to :

(A) Power transmission

(B) Metering mechanism

(C) Furrow opener

(D) Calibration process

59. Convert 37°C to Kelvin scale :

(A) 097 K

(B) 274 K

(C) 298 K

(D) 310 K

60. The break-even point is the point at which :

(A) Total expenses = Total revenue

(B) Fixed cost = Variable cost

(C) Total expenses < Total revenue

(D) Total expenses > Total revenue

61. The difference between the actual sales and break-even sales is known as :

(A) Margin of safety

(B) Price-cost margin

(C) Fixed cost

(D) Profit

62. Which of these accounts for more than half of tractor-related deaths ?

(A) Overturns

(B) Run-overs

(C) Highway collisions

(D) Field collisions

63. What is the number of splines for a 1000 rpm PTO shaft ?

(A) 17

(B) 21

(C) 23

(D) 25

64. What does ROPS stand for ?

(A) Roof Protective Structure

(B) Rangeland Occupation Protection System

(C) Recovery Operation Program Status

(D) Rollover Protection Structure

65. Which one is not included in the safety program for the prevention of accidents ?

(A) Development of safe working conditions

(B) Promotion of employees participation in safety

(C) Corrective measures for the prevention of accidents

(D) Compensation and medical payment

66. What is the process in which the rate of heat transfer is maximum ?

(A) Conduction

(B) Convection

(C) Radiation

(D) Evaporation

67. Which principle is used to calculate the energy requirements based on the heart rate and oxygen consumption of a person ?

(A) Biomechanical principle

(B) Physiological principle

(C) Anthropometric principle

(D) Psychological principle

68. Noise level is measured in :

(A) Decibel

(B) Hertz

(C) ppm

(D) Pascal

69. The most frequently used controls in the dashboard are arranged in :

(A) Left side

(B) Right side

(C) Central location

(D) All of these

70. What are common ergonomic risk factors in manually operated agricultural tools ?

(A) Awkward working postures

(B) Excessive repetition

(C) Excessive force

(D) All of these

71. What does ergonomics mean ?

(A) The laws of work

(B) Keep your back straight

(C) Posture at work

(D) All of these

72. Calculate the Body Mass Index (BMI) for a person whose height is 1.70 m and whose weight is 70 kg :

(A) 20.5

(B) 24.2

(C) 41.2

(D) None of these

73. What is the daily exposure action value for hand-arm vibration ?

(A) $1.5\ m/s^2\ A(8)$

(B) $2.5\ m/s^2\ A(8)$

(C) $3.5\ m/s^2\ A(8)$

(D) $3.7\ m/s^2\ A(8)$

74. What does HMI stand for ?

(A) Human Machine Interaction

(B) Human Machine Interface

(C) Human Machine Implementation

(D) Human Machine Involvement

75. Grey color is associated with the revolution in :

(A) Milk production

(B) Grain production

(C) Fertilizer production

(D) None of these

76. What is VRT in precision agriculture ?

(A) Variable Rate Transfer

(B) Variable Rate Technology

(C) Virtual Reality Technology

(D) Voltage Reduction Technology

77. Which one is not directly related to precision farming ?

(A) Prevents forest degradation

(B) Increase agriculture productivity

(C) Efficient use of water resources

(D) Prevents soil degradation

78. Drone in agriculture is most widely used for :

(A) Planting

(B) Spraying

(C) Irrigation

(D) Harvesting

79. Which power is the primary source for running small equipment and tools at the farm ?

(A) Human power

(B) Animal power

(C) Mechanical power

(D) Electrical power

80. Technician 'X' says that engine oil is used to clean, cool and lubricate the engine. Technician 'Y' says that engine oil helps seal some internal engine parts. The correct statement is said by :

(A) X only

(B) Y only

(C) Neither X nor Y

(D) Both X and Y

81. A differential system of tractor is fitted in between :

(A) Engine and gearbox

(B) Gearbox and final drive

(C) Clutch and gearbox

(D) Engine and final drive

82. Which one is the most appropriate fuel to blend with bio-ethanol for transport fuel ?

(A) Diesel

(B) Petrol

(C) Kerosene

(D) All of these

83. What is the name of a process that converts fats and oils into biodiesel and glycerin ?

(A) Fermentation

(B) Transesterification

(C) Distillation

(D) All of these

84. The main composition of biogas is :

(A) Methane

(B) Carbon dioxide

(C) Nitrogen

(D) Hydrogen

85. Which one is correct for feeding biomass material and gasification agent into an updraft gasifier ?

(A) Biomass from top, gasifying agent from top

(B) Biomass from top, gasifying agent from bottom

(C) Biomass from bottom, gasifying agent from top

(D) Biomass from bottom, gasifying agent from bottom

86. Which feature is not true for fixed dometype biogas plants ?

(A) Constant gas pressure

(B) Less maintenance

(C) No corrosion problem

(D) Better heat insulation

87. Which of the following is a major drawback for most renewable energy sources ?

(A) High pollution

(B) High running cost

(C) Available only in a new places

(D) Unreliable supply

88. Determine wind power if the wind speed is 10 m/s and has a blade length of 20 m. (air density $\rho = 1.23\ kg/m^3$) :

(A) 625 kW

(B) 773 kW

(C) 851 kW

(D) 855 kW

89. A photovoltaic cell or solar cell converts :

(A) Thermal energy into electricity

(B) Solar radiation into thermal energy

(C) Electromagnetic radiation into electricity

(D) Solar radiation into kinetic energy

90. The theoretical maximum efficiency of a wind turbine is given by the Betz Limit and is about :

(A) 30%

(B) 48%

(C) 59%

(D) 65%

91. The wind speed is measured using an instrument called :

(A) Pyrometer

(B) Anemometer

(C) Manometer

(D) Wind vane

92. The angle between the beam from the Sun and the Vertical is known as :

(A) Solar Azimuth angle

(B) Altitude angle

(C) Zenith angle

(D) Hour angle

93. Which of the following is the phase of Project Management ?

(A) Project planning

(B) Project scheduling

(C) Project controlling

(D) All of these

94. Who introduced the bar charts in Project Management ?

(A) Henry Gantt

(B) Williams Henry

(C) Jane Gantt

(D) Joseph Henry

95. What does PERT stand for ?

(A) Program Evaluation and Review Technique

(B) Program Evaluation and Robot Technology

(C) Program Evaluation and Robot Technique

(D) Program Evaluation and Rate Technology

96. The activity which can be achieved under ideal circumstances within the shortest possible time is known as :

(A) Optimistic time estimate

(B) Most likely time estimate

(C) Expected time estimate

(D) Pessimistic time estimate

97. The method for solving LPP without using artificial variables is called :

(A) Simplex method

(B) Big-M method

(C) Dual simplex method

(D) Graphical method

98. What is one drawback of the North-West Corner rule to finding the initial solution for the transportation problem ?

(A) It leads to a degenerate initial solution.

(B) It does not take into account the cost of transportation.

(C) It is complicated to implement and use.

(D) All of these

99. The transportation problem deals with the transportation of :

(A) Single product from a source to several destinations

(B) Single product from several sources to a destination

(C) Several products from a source to a destination

(D) Several products from several sources to several destinations

100. The finding of initial feasible solution in transportation problem which method is used ?

(A) Least cost method

(B) Hungarian

(C) Big-M

(D) Simplex

SPACE FOR ROUGH WORK

SEAL