

PORT. NO. 1

Total No. of Printed Pages : 22

18P/305/23

Question Booklet No .....

(To be filled up by the candidate by Blue/black ball-point pen)

Poll No.

10 be filled up by the candidate by Blue/black b

Roll No. (Write the digits in words)

Code 11016

Serial No. of OMR Answer Sheet

Centre Code No. \_\_\_\_\_

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(Signature of Invigilator)

## INSTRUCTIONS TO CANDIDATES

Write in the space above and on both sides of the Answer Sheet in blue black ball-point pen in the space above and on both sides of the Answer Sheet in

Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.

4. Do not bring any loose paper, written or blank, inside the Examination Hall except the Admit Card.
5. A separate OMR Answer Sheet is given. It should not be folded or mutilated. A second OMR Answer Sheet shall not be provided. Only the OMR Answer Sheet will be evaluated.
6. Entries by blue/black pen in the space provided above.
7. On the front page of the OMR Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, write the Question Booklet Number, Centre Code Number and the Set Number wherever applicable in appropriate spaces.
8. No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR Answer sheet and Roll No. and OMR Answer sheet no. on the Question Booklet.

... in the aforesaid entries is to be verified by the invigilator, otherwise it will be  
... by the means.

The question in this Booklet is followed by four alternative answers. For each question, you have to record the correct option on the Answer Sheet by darkening the appropriate bubble in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines on the first page of the OMR Answer Sheet.

For each question, darken only one circle on the OMR Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.

*Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded 0 mark).*

**HOMEWORK:** use the inner back page of the title cover and the blank page at the end of this Booklet

After the test, the candidate must hand over the OMR Answer Sheet to the Invigilator in the examination room/hall. However, candidates are allowed to take away Test Booklet and copy of the Answer Sheet with them.

Test takers are not permitted to leave the Examination Hall until the end of the Test.

11. She attempts to use any form of unfair means, but she shall be liable to be treated as an

# ROUGH WORK

रफ़ कार्य

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No. of Questions : 120

Time : 2 Hours]

[Full Marks : 360

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**Note :** (1) Attempt as many questions as you can. Each question carries 3 (Three) marks. *One mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.*

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

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1. Which of the following is not an essential nutrient ?

- |              |                |
|--------------|----------------|
| (1) Nitrogen | (2) Phosphorus |
| (3) Sulphur  | (4) Arsenic    |

2. *Khaira* disease in rice is due to deficiency of

- |          |               |
|----------|---------------|
| (1) Zinc | (2) Copper    |
| (3) Iron | (4) Manganese |

3. Essentiality criteria for classifying elements as essential nutrients was given by

- |                              |                              |
|------------------------------|------------------------------|
| (1) Arnon and Stout (1939)   | (2) Warington (1923)         |
| (3) Subbiah and Asija (1956) | (4) Sommer and Lipman (1926) |

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4. Phosphorus is absorbed by the plant roots as

- |                          |                    |
|--------------------------|--------------------|
| (1) Phosphate ions       | (2) Phosphite ions |
| (3) Elemental phosphorus | (4) Phosphene gas  |

5. Unit of cation exchange capacity is

- |              |   |
|--------------|---|
| (1) mmhos/cm | (2) $\text{cmol}(\text{p}^+)/\text{kg}$ |
| (3) ppm      | (4) per cent                            |

6. Soil having  $\text{pH} < 8.5$ ,  $\text{EC} > 4.0$  mmhos/cm and  $\text{ESP} < 15$  is classified as

- |                        |                     |
|------------------------|---------------------|
| (1) Alkali soil        | (2) Saline soil     |
| (3) Saline-alkali soil | (4) Calcareous soil |

7. Which of the following nutrient is a constituent of chlorophyll ?

- |        |        |        |       |
|--------|--------|--------|-------|
| (1) Mg | (2) Cl | (3) Zn | (4) B |
|--------|--------|--------|-------|

8. Which of the following relationship is correct ?

- |   |   |
|---|---|
| (1) $\text{P}_2\text{O}_5 = 2.29 \times \text{P}$ | (2) $\text{P} = 2.29 \times \text{P}_2\text{O}_5$ |
| (3) $\text{P}_2\text{O}_5 = 1.12 \times \text{P}$ | (4) $\text{P}_2\text{O}_5 = 3.00 \times \text{P}$ |

9. Which of the following is not a phosphatic fertilizer ?

- |               |         |
|---------------|---------|
| (1) Bone meal | (2) DAP |
| (3) MAP       | (4) MOP |

10. According to International Society of Soil Science (now International Union of Soil Sciences) classification, the size of silt particles ranges between
- (1) 0.05-0.002 mm (2) 0.02-0.002 mm  
(3) 0.2-0.02 mm (4) < 0.002 mm
11. Quartz has a chemical formula of
- (1)  $\text{SiO}_2$  (2)  $\text{KAlSi}_3\text{O}_8$   
(3)  $\text{Fe}_2\text{O}_3$  (4)  $\text{Al}_2\text{O}_3$
12. Which of the following is a dominant clay mineral in laterite and lateritic soils ?
- (1) Kaolinite (2) Smectite  
(3) Illite (4) Vermiculite
13. Heavy soils are characterized by
- (1) Low bulk density (2) High sand fraction  
(3) Poor nutrient retention (4) None of these
14. Acid sulphate soils suffer from toxicity of
- (1) Aluminium (2) Sodium  
(3) Calcium (4) Phosphorus
15. In reclamation of sodic soils, the amendment used is
- (1) Calcite (2) Dolomite  
(3) Gypsum (4) Tourmaline

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16. Number of Soil Orders identified so far as per Soil Taxonomy is

- (1) 10                      (2) 11                      (3) 12                      (4) 13

17. Which of the following is a diagnostic sub-surface horizon in Soil Taxonomy ?

- (1) Mollic                                      (2) Ochric  
(3) Umbric                                      (4) Argillic

18. *Soil property = Function of (climate, biosphere, relief, parent material, time).*  
This equation was propounded by :

- (1) H. Jenny                                      (2) J. S. Joffe  
(3) C. E. Kellogg                                      (4) C. F. Marbut

19. Physical disintegration and chemical decomposition of rocks and minerals resulting in the formation of parent material is termed as

- (1) Weathering                                      (2) Soil formation  
(3) Laterization                                      (4) Podzolization

20. Which of the following is an example of sedimentary rocks ?

- (1) Granite                                      (2) Basalt  
(3) Gabbro                                      (4) Shale

21. Most abundant element on weight basis in Earth's crust is

- (1) Silicon                                      (2) Oxygen  
(3) Aluminium                                      (4) Iron

22. Which of the following is known as Father of Soil Science ?
- (1) V. V. Dokuchaev (2) J. H. Liebig  
(3) J. S. Kanwar (4) H. Jenny
23. Land area degraded by soil erosion (water + wind) in India is about
- (1) 86 Mha (2) 72 Mha  
(3) 120 Mha (4) 144 Mha
24. A layer generally parallel to the soil surface differing in terms of colour, texture, structure, boundaries etc. is referred to as
- (1) Soil horizon (2) Soil profile  
(3) Soil type (4) Soil series
25. Parent material transported and deposited by water (rivers and streams) is called
- (1) Alluvium (2) Colluvium  
(3) Outwash (4) Marine
26. A soil has bulk density of  $1.68 \text{ g/cm}^3$  and particle density of  $2.80 \text{ g/cm}^3$ . Pore space of this soil is
- (1) 40% (2) 60% (3) 80% (4) 20%
27. Carbon dioxide content in atmosphere in 2015 in parts per million by volume (ppm V) exceeded
- (1) 400 (2) 450 (3) 425 (4) 475

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28. Which of the following is not a greenhouse gas ?

- (1)  $O_2$                       (2)  $CO_2$                       (3)  $N_2O$                       (4)  $CH_4$

29. Fundamental law used for determining the soil mechanical composition is

- (1) Stokes' law                                      (2) Darcy's law  
(3) Ohm's law                                      (4) Fick's law

30. Nutritional disorder in rice occurring due to toxicity of hydrogen sulphide is called

- (1) *Akiochi*                                      (2) *Khaira*  
(3) *Itai itai*                                      (4) White bud

31. pH of 0.0001 M HCl is

- (1) 2                      (2) 3                      (3) 4                      (4) 5

32. Which of the following is a unit of electrical conductivity ?

- (1) deciSiemen/m                                      (2) moles/L  
(3) Ohm's                                      (4) Parts per million

33. Method used to determine easily oxidizable organic carbon is famous and referred to as

- (1) Walkley-Black                                      (2) Arnon-Stout  
(3) Lindsay-Norvell                                      (4) Haber-Bosch



34. Easily oxidizable organic carbon content of soil is taken as the measure of availability of
- |                |               |
|----------------|---------------|
| (1) Phosphorus | (2) Potassium |
| (3) Sulphur    | (4) Nitrogen  |
35. Which of the following is described as the universally deficient element in Indian soils ?
- |                |               |
|----------------|---------------|
| (1) Phosphorus | (2) Potassium |
| (3) Zinc       | (4) Nitrogen  |
36. Phosphorus availability in soil is maximum in the range of
- |             |             |
|-------------|-------------|
| (1) 3.5-4.5 | (2) 5.0-6.0 |
| (3) 6.5-7.5 | (4) 7.5-8.5 |
37. Which of the following is an iron-mineral ?
- |               |                |
|---------------|----------------|
| (1) Magnesite | (2) Magnetite  |
| (3) Apatite   | (4) Sphalerite |
38. As per Fertilizer Control Order, minimum N content in urea by weight must be
- |         |         |         |         |
|---------|---------|---------|---------|
| (1) 46% | (2) 39% | (3) 25% | (4) 18% |
|---------|---------|---------|---------|
39. Which of the following fertilizer *per se* does not contain any nutrient yet it is called fertilizer ?
- |                          |                        |
|--------------------------|------------------------|
| (1) Organic fertilizer   | (2) Mineral fertilizer |
| (3) Inorganic fertilizer | (4) Biofertilizer      |

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40. High cation exchange capacity of black cotton soils (Vertisols) is due to the predominance of clay mineral named
- (1) Kaolinite (2) Smectite (Montmorillonite)  
(3) Illite (4) Chlorite
41. Scale of pH meter ranges from
- (1) 0 to 7 (2) 7-14 (3) 0 to 14 (4) -14 to 14
42. As per Fertilizer Control Order DAP must contain minimum (by weight) of
- (1) 11% N + 52%  $P_2O_5$  (2) 18% N + 52%  $P_2O_5$   
(3) 11% N + 46%  $P_2O_5$  (4) 18% N + 46%  $P_2O_5$
43. Total number of farm holdings as per 2010-2011 agricultural census in India is
- (1) 138 million (2) 38 million  
(3) 138 crore (4) 125 crore
44. As per Government of India Order, urea has to be fully coated with
- (1) Neem oil (2) Gypsum  
(3) Sulphur (4) Polymer
45. Which of the following is most concentrated source of N ?
- (1) Anhydrous ammonia (2) Urea  
(3) Ammonium chloride (4) Ammonium nitrate

46. Which of the following is an acidic cation ?
- (1)  $\text{Ca}^{2+}$                       (2)  $\text{Mg}^{2+}$                       (3)  $\text{K}^{+}$                       (4)  $\text{Al}^{3+}$
47. Which of the following term does not describe the moisture status of soil ?
- (1) Udic                      (2) Ustic                      (3) Aquic                      (4) Mesic
48. Relative proportion of sand, silt and clay content on weight basis is termed as soil
- (1) Texture    (2) Structure  
(3) Tilth    (4) Aggregation
49. Weight of 0-15 cm layer of one hectare of soil with bulk density of  $1.5 \text{ g/cm}^3$  is
- (1)  $2.0 \times 10^6 \text{ kg}$     (2)  $2.25 \times 10^6 \text{ kg}$   
(3)  $2.5 \times 10^6 \text{ kg}$     (4)  $2.25 \times 10^3 \text{ kg}$
50. Hue, value and chroma are used together to describe
- (1) Soil texture    (2) Soil structure  
(3) Soil plasticity    (4) Soil colour
51. Available water is given by difference between water content at
- (1) Field capacity and Wilting Point  
(2) Saturation and Field capacity  
(3) Field capacity and Hygroscopic Coefficient  
(4) Wilting Point and Hygroscopic Coefficient

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52. Which of the following technique is not used to measure soil water content ?
- (1) Neutron moisture meter
  - (2) Flame photometer
  - (3) Electrical resistance method
  - (4) Gamma ray attenuation technique
53. Which of the following is a PHYSICAL property of soil ?
- (1) Organic carbon
  - (2) Cation exchange capacity
  - (3) pH
  - (4) Infiltration rate
54. Which of the following is not a soil forming process ?
- (1) Laterization
  - (2) Podzolization
  - (3) Gleization
  - (4) Flocculation
55. Which of the following micro-organism is associated with biological nitrogen fixation ?
- (1) Vesicular arbuscular mycorrhiza
  - (2) *Aspergillus awamori*
  - (3) *Alternaria solani*
  - (4) *Rhizobium*
56. Arrangement of silica ( $\text{SiO}_2$ ) and alumina [ $\text{Al}_2(\text{OH})_6$ ] sheets in kaolinite follows the sequence
- (1) 1:1
  - (2) 2:1
  - (3) 1:2
  - (4) None of these

57. In 0.1 N HCl *versus* 0.1 N NaOH titration, indicator used is
- (1) Phenolphthalein (2) Murexide  
(3) Thymol blue (4) Diphenylamine
58. From point of crop production, most favourable soil structure is
- (1) Prismatic (2) Platy  
(3) Blocky (4) Granular
59. Which of the following is not a unit of mass ?
- (1) Pound (2) Kilogram  
(3) Bushel (4) Litre
60. Physical condition of a soil as related to its ease of tillage, fitness as a seed bed and impedance to seedling emergence and root penetration is called
- (1) Tilt (2) Soft  
(3) Hard (4) None of these
61. Which of the relationship holds for conversion of soil organic carbon (SOC) to soil organic matter (SOM) ?
- (1)  $SOM = 0.58 \times SOC$  (2)  $SOM = 1.72 \times SOC$   
(3)  $SOM = 1.12 \times SOC$  (4)  $SOM = 2.29 \times SOC$

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62. Which of the following is not a pressurised method of irrigation ?

- |               |                 |
|---------------|-----------------|
| (1) Sprinkler | (2) Drip        |
| (3) Rain gun  | (4) Check basin |

63. Uniform removal of soil layer sloping lands by action of water is called as

- |                    |                   |
|--------------------|-------------------|
| (1) Rill erosion   | (2) Gully erosion |
| (3) Splash erosion | (4) Sheet erosion |

64. Which of the following law deals with water flow in porous medium like soil ?

- |                   |                |
|-------------------|----------------|
| (1) Darcy's law   | (2) Fick's law |
| (3) Fourier's law | (4) Ohm's law  |

65. Particles are called COLLOIDAL if their diameter is between

- |                         |                         |
|-------------------------|-------------------------|
| (1) 2-200 nm            | (2) 1-100 nm            |
| (3) 2-200 $\mu\text{m}$ | (4) 1-100 $\mu\text{m}$ |

66. Dominant clay mineral in black cotton soils (Vertisols) is

- |               |                                |
|---------------|--------------------------------|
| (1) Kaolinite | (2) Vermiculite                |
| (3) Illite    | (4) Smectite (Montmorillonite) |

67. Anion exchange capacity exhibited by the soil is due to presence of

- |               |                 |
|---------------|-----------------|
| (1) Kaolinite | (2) Vermiculite |
| (3) Illite    | (4) Chlorite    |

68. Which of the following is a boron-containing mineral ?
- (1) Apatite (2) Magnetite  
(3) Hematite (4) Tourmaline
69. Which of the following acts as an electron acceptor in aerobic respiration ?
- (1) Oxygen (2) Hydrogen  
(3) Nitrogen (4) Carbon dioxide
70. End product of mineralization of N under fully oxidative environment is
- (1) Ammonia (2) Nitrate  
(3) Dinitrogen (4) Protein
71. Which of the following term does not denote soil temperature ?
- (1) Frigid (2) Mesic  
(3) Thermic (4) Natric
72. Acid sulphate soils occur predominantly in State of
- (1) Punjab (2) Himachal Pradesh  
(3) Andhra Pradesh (4) Kerala
73. Management of acid soils centres around the application of
- (1) Lime (2) Gypsum  
(3) Bentonite (4) Iron sulphate

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74. Which of the following is an acid forming fertilizer ?

- |                       |                       |
|-----------------------|-----------------------|
| (1) Muriate of potash | (2) Bone meal         |
| (3) Calcium cyanamide | (4) Ammonium sulphate |

75. Residual sodium carbonate (RSC), a measure of potential water sodicity, is given by relationship

- (1)  $RSC = (Ca^{2+} + Mg^{2+}) - (CO_3^{2-} + HCO_3^-)$
- (2)  $RSC = (CO_3^{2-} + HCO_3^-) - (Ca^{2+} + Mg^{2+})$
- (3)  $RSC = (Na^+ + K^+) - (CO_3^{2-} + HCO_3^-)$
- (4)  $RSC = (CO_3^{2-} + HCO_3^-) - (Na^+ + K^+)$

(Units of cation and anion concentrations are in meq/L)

76. Fraction of soil humus soluble in both alkali and acid solutions is termed as

- |                 |                  |
|-----------------|------------------|
| (1) Humic acids | (2) Fulvic acids |
| (3) Humin       | (4) Amino acids  |

77. Carbon : Nitrogen (C:N) ratio of soil humus ranges between

- |                 |                 |
|-----------------|-----------------|
| (1) 9:1 - 12:1  | (2) 15:1 - 18:1 |
| (3) 21:1 - 24:1 | (4) 5:1 - 8:1   |

78. Mineralization is a biological process just opposite of

- |                     |                 |
|---------------------|-----------------|
| (1) Immobilization  | (2) Respiration |
| (3) Phosphorylation | (4) Fixation    |



79. Number of nutrients identified so far as essential for plant growth is
- (1) 15                      (2) 16                      (3) 17                      (4) 18
80. Capacity of a soil to function within ecosystem boundaries to sustain biological productivity, maintain environmental quality, and promote plant and human health is termed as
- (1) Soil quality    (2) Soil erodibility  
(3) Soil fertility    (4) Soil productivity
81. Which one of the following is not a biological property of soil ?
- (1) Biomass carbon    (2) Dehydrogenase activity  
(3) Nutrient mineralization    (4) Bulk density
82. Which of the following compound is referred to as 'Energy currency of the plants' ?
- (1) Adenosine diphosphate    (2) Adenosine triphosphate  
(3) Diammonium phosphate    (4) Single super phosphate
83. Which of the following bacteria is involved in conversion of ammonium to nitrite ?
- (1) Nitrobacter    (2) Nitrosomonas  
(3) Azotobacter    (4) Acetobacter
84. Nitrogen and hydrogen gases are made to combine at high temperature and pressure to yield
- (1) Ammonia    (2) Nitrous oxide  
(3) Nitric oxide    (4) Nitrosamine

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85. Unit of soil water suction expressed as logarithm of height of water column in cm above free water level is termed as

- (1) pH                      (2) pE                      (3) pF                      (4) pP

86. Lime potential is given by expression

- (1)  $p\text{Fe} + 2p\text{OH}$                       (2)  $1/2p\text{Ca} + p\text{H}_2\text{PO}_4$   
(3)  $p\text{H} - 1/2p\text{Ca}$                       (4) None of these

87. Loss of electrons in redox reactions is termed as

- (1) Oxidation                      (2) Reduction  
(3) Complexation                      (4) Neutralization

88. Removal of soil material from surface soil layer as suspension or in the form of solution is called

- (1) Alluviation                      (2) Illuvation  
(3) Cheluviation                      (4) Eluviation

89. A vertical section of soil through all its horizons and extending into parent material is called

- (1) Soil profile                      (2) Pedon  
(3) Diagnostic horizon                      (4) Epipedon

90. The basic unit of soil classification of a family and consisting of soils that are alike in all major soil characteristics is called as

- (1) Soil type                      (2) Soil series  
(3) Soil group                      (4) Solum

91. Which of the following process is not linked to 'Nitrogen cycle in nature' ?
- (1) Ammonia volatilization                      (2) Nitrification  
(3) Denitrification                                (4) Laterization
92. On heating at 132 °C, urea molecule decomposes to yield
- (1) Nitric oxide                                      (2) Biuret  
(3) Nitrogen gas                                   (4) Nitrous oxide
93. Which of the following compound is a nitrification inhibitor ?
- (1) DCD    (2) 2,4-D  
(3) PPDA     (4) Hydroquinone
94. Which of the following acid is used for manufacture of single super phosphate from phosphate rock ?
- (1)  $\text{H}_3\text{PO}_4$                       (2)  $\text{HNO}_3$                       (3)  $\text{HCl}$                       (4)  $\text{H}_2\text{SO}_4$
95. Branch of Science dealing with the influence of soil on living beings, particularly plants, including human use of land for plant growth is called
- (1) Edaphology                                      (2) Pedology  
(3) Geology     (4) Botany
96. Horizon characterized by maximum eluviation of silicate clays and sesquioxides, and occurring above the B horizon and below the A horizon is termed as
- (1) O horizon                                        (2) E horizon  
(3) C horizon                                        (4) R horizon

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97. Content of water on mass or volume basis, remaining in the soil 2 or 3 days after having been wetted with water and after free drainage is called

- |                      |                       |
|----------------------|-----------------------|
| (1) Wilting point    | (2) Field capacity    |
| (3) Saturation water | (4) Hygroscopic water |

98. Science dealing with evaluation of Earth's surface is called

- |               |                   |
|---------------|-------------------|
| (1) Geology   | (2) Zoology       |
| (3) Geography | (4) Geomorphology |

99. Deposit of parent material laid down by rivers or streams is called

- |             |               |
|-------------|---------------|
| (1) Fluvial | (2) Colluvial |
| (3) Loess   | (4) Aeolian   |

100. A coarse textured acid igneous rock containing chiefly feldspars and quartz and some mica and/or hornblende is

- |               |            |
|---------------|------------|
| (1) Sandstone | (2) Basalt |
| (3) Granite   | (4) Shale  |

101. Water which moves into, through or out of soil under the influence of gravity is

- |                         |                   |
|-------------------------|-------------------|
| (1) Capillary water     | (2) Free water    |
| (3) Gravitational water | (4) None of these |

102. Gypsum requirement is determined for the reclamation of

- |                     |                 |
|---------------------|-----------------|
| (1) Saline soil     | (2) Alkali soil |
| (3) Calcareous soil | (4) Light soil  |

103. Quantity of grain yield of cereal crop per unit of total biomass produced is

- |                    |                   |
|--------------------|-------------------|
| (1) Economic yield | (2) Optimum yield |
| (3) Harvest plus   | (4) Harvest index |

104. Amount of heat required to raise the temperature of a given quantity of a soil by  $1^{\circ}\text{C}$  is

- |                   |                   |
|-------------------|-------------------|
| (1) Heat flux     | (2) Heat content  |
| (3) Heat capacity | (4) Specific heat |

105. Volume of water moving per unit area of soil per unit time is called

- |                            |                   |
|----------------------------|-------------------|
| (1) Water potential        | (2) Water content |
| (3) Hydraulic conductivity | (4) Water flux    |

106. Hydrometer is used for determining

- |                       |                                    |
|-----------------------|------------------------------------|
| (1) Water content     | (2) Mechanical composition of soil |
| (3) Water diffusivity | (4) Soil consistence               |

107. Maintenance of soil fertility and plant nutrient supply at an optimum level for sustaining the desired productivity through optimization of the benefits from organic, inorganic and biological nutrient sources is termed as

- |                                    |                            |
|------------------------------------|----------------------------|
| (1) Integrated nutrient management | (2) Balanced fertilization |
| (3) Organic farming                | (4) Fertilization          |

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**108.** Replacement of one atom by another of similar size in a crystal structure without disrupting or seriously changing the structure is referred to as

- |                              |                       |
|------------------------------|-----------------------|
| (1) Ionic substitution       | (2) Ionic replacement |
| (3) Isomorphous substitution | (4) None of these     |

**109.** Two dimensional entity representing area and landscape on Earth is called as

- |                 |                 |
|-----------------|-----------------|
| (1) Soil        | (2) Land        |
| (3) Earth crust | (4) Lithosphere |

**110.** Energy due to a motion of particle that is proportional to its velocity squared is

- |                       |                    |
|-----------------------|--------------------|
| (1) Potential energy  | (2) Kinetic energy |
| (3) Electrical energy | (4) None of these  |

**111.** Which of the following law states that 'The growth and reproduction of an organism is dependent on the nutrient that is available in minimum quantity'?

- |                            |                              |
|----------------------------|------------------------------|
| (1) Liebig's law           | (2) Mitscherlich's law       |
| (3) Wallace law of maximum | (4) Bray's nutrient mobility |

**112.** Which method is used to determine available phosphorus in calcareous soil?

- |                              |                                |
|------------------------------|--------------------------------|
| (1) Bray and Kurtz (1945)    | (2) Olsen et al. (1954)        |
| (3) Subbiah and Asija (1956) | (4) Lindsay and Norvell (1978) |

**113.** Graphical method for determining critical nutrient level of deficiency in soil was given by

- |                            |                           |
|----------------------------|---------------------------|
| (1) Bray (1954)            | (2) Parker (1951)         |
| (3) Cate and Nelson (1965) | (4) Nye and Tinker (1977) |

114. Which of the following enzymes is associated with biological nitrogen fixation ?

- |                   |                 |
|-------------------|-----------------|
| (1) Urease        | (2) Nitrogenase |
| (3) Dehydrogenase | (4) Kinase      |

115. Depressing effect caused by one or more nutrients on the uptake and availability of another nutrient in plant is termed as

- |                     |                   |
|---------------------|-------------------|
| (1) Additive effect | (2) Synergism     |
| (3) Antagonism      | (4) None of these |

116. Surface soil layer with a very high percentage of organic matter is

- |               |               |
|---------------|---------------|
| (1) A horizon | (2) B horizon |
| (3) O horizon | (4) E horizon |

117. Science of rocks which form the units of Earth's crust is called

- |                 |               |
|-----------------|---------------|
| (1) Geology     | (2) Geography |
| (3) Meteorology | (4) Petrology |

118. Unconsolidated mantle of the weathered rock and soil material on the Earth's surface or loose earth material above the solid rock is called

- |                  |                  |
|------------------|------------------|
| (1) Soil profile | (2) Soil horizon |
| (3) Earth crust  | (4) Regolith     |

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119. Which of the following relation is correct ?

(1)  $\text{ppm} = 10^2 \times \text{percent}$

(2)  $\text{ppm} = 10^{-4} \times \text{percent}$

(3)  $\text{ppm} = 10^4 \times \text{percent}$

(4)  $\text{ppm} = 10^{-2} \times \text{percent}$

120. Which of the following mineral does not contribute to cation exchange capacity (CEC) ?

(1) Illite

(2) Kaolinite

(3) Chlorite

(4) Quartz

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# ROUGH WORK

रफ़ कार्य

## अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली/काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में क्या पृष्ठ मौजूद हैं और कोई प्रश्न छूटा या अतिरिक्त प्रश्न/प्रश्नोत्तर दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।

2. परीक्षा भवन में प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।

ओ.एम.आर. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा ओ.एम.आर. उत्तर-पत्र नहीं दिया जायेगा। केवल ओ.एम.आर. उत्तर-पत्र का ही मूल्यांकन किया जायेगा।

3. उत्तरों को केवल प्रथम आवरण-पृष्ठ पर नीली/काली पेन से निर्धारित स्थान पर लिखें।

4. ओ.एम.आर. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक, केन्द्र कोड नम्बर तथा सेट का नम्बर उचित स्थानों पर लिखें।

ओ.एम.आर. उत्तर-पत्र पर अनुक्रमांक संख्या, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका पर अनुक्रमांक संख्या और ओ.एम.आर. उत्तर-पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।

5. प्रश्नपत्र पर प्रविष्टिओं में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनाधिकृत भ्रम का प्रयोग माना जायेगा।

प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको ओ.एम.आर. उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।

6. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अवश्य एक वृत्त को अर्थहीन माना जायेगा।

7. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर गलत देना चाहते हैं, तो सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर स्याही लगाया नहीं जायेगा।

8. प्रश्नपत्र के अन्तिम पृष्ठ पर ओ.एम.आर. उत्तर-पत्र के मुखपृष्ठ के अन्दर वाला पृष्ठ तथा उत्तर-पुस्तिका के अन्तिम पृष्ठ का प्रयोग नहीं करें।

9. परीक्षा समाप्त के बाद आशुपति अपना ओ.एम.आर. उत्तर-पत्र परीक्षा कक्ष/हाल में कक्ष निरीक्षक को सौंप दें। आशुपति अपने साथ प्रश्न पुस्तिका तथा ओ.एम.आर. उत्तर-पत्र की प्रति ले जा सकते हैं।

10. परीक्षा की परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।

11. परीक्षा के अन्तिम पक्षों में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भोग्य होगा/होगी।