

# Sikkim Public Service Commission

Main Written Examination for the Post of **WDO/HDO/ADO**

**Paper - II**

Time Allowed : 3 Hrs.

Maximum Marks : 300

## INSTRUCTIONS TO CANDIDATES

*Read the following instructions carefully before answering the questions :-*

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.
2. Please note that it is the candidate's responsibility to fill in the Roll Number and Test Booklet Serial Number carefully and without any omission or discrepancy at the appropriate places in the **OMR ANSWER SHEET**.
3. **Use only Black Ball Point Pen to fill the OMR sheet**
4. Do not write anything else on the OMR Answer Sheet except the required information.
5. **This Test Booklet contains two Sections i.e Section A and B. Section A contains Multiple choice Questions i.e. 100 items in MCQ Mode to be marked in OMR Sheet. Section B contains Conventional/Subjective Type of Questions which has to be written in Seperate Answer sheet provided to you.**
6. **All items from Q.1 to 100 carries 2 marks each.**
7. Before you proceed to mark in the Answer Sheet (OMR), you have to fill in some particulars in the Answer Sheet (OMR) as per given instructions.
8. After you have completed filling in all your responses on the Answer Sheet (OMR) and the examination has concluded, you should hand over the Answer Sheet (OMR) and the Seperate conventional Answer sheet to the Invigilator only . You are permitted to take away with you the Test Booklet.
9. **Marking Scheme**  
*There will be negative marking for wrong answers marked by a candidate in the objective type question papers.*
  - (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to that question will be deducted as penalty.
  - (ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to the question.
  - (iii) If a question is left blank. i.e., no answer is given by the candidate, there will be no penalty for that question.

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO**



**Paper - II**  
**Section - A**

**Objective Type Questions**

**(100 × 2 = 200)**

**ANSWER ALL QUESTIONS**

- 1. Which one is not true for puddling?**
  - A. Incorporates weeds into soil
  - B. Prevents the destruction of soil structure
  - C. Reduces deep percolation loss of water
  - D. Maintains soft seedbed
- 2. Which nutrient is not mobile in plants?**
  - A. Nitrogen
  - B. Phosphorus
  - C. Potassium
  - D. Calcium
- 3. At very low concentration, 2,4-D acts as:**
  - A. Herbicide
  - B. Hormone
  - C. Both herbicide and hormone
  - D. Enzyme
- 4. Triticum durum is known as:**
  - A. Macaroni wheat
  - B. Emmer wheat
  - C. Common bread wheat
  - D. Indian dwarf wheat
- 5. Which corn has minimum seed rate for sowing?**
  - A. Pop corn
  - B. Baby corn
  - C. Sweet corn
  - D. QPM
- 6. Nipping is practiced in:**
  - A. Green gram
  - B. Black gram
  - C. Bengal gram
  - D. Pigeonpea
- 7. Tikka disease occurs in:**
  - A. Mustard
  - B. Groundnut
  - C. Soybean
  - D. Sesamum
- 8. The recommended seed rate of pearl millet is:**
  - A. 4-5 kg/ha
  - B. 8-10 kg/ha
  - C. 15-16 kg/ha
  - D. 20-22 kg/ha
- 9. The relationship between protein and oil content in mustard seed is:**
  - A. Linear
  - B. Inverse
  - C. Quadratic
  - D. Cubic

- 10. The varieties 'Prabhat' and 'UPAS 120' belong to:**
- |            |              |
|------------|--------------|
| A. Barley  | B. Sorghum   |
| C. Soybean | D. Pigeonpea |
- 11. Apical dominance in plants is due to:**
- |               |                 |
|---------------|-----------------|
| A. Auxin      | B. Gibberellins |
| C. Cytokinins | D. Ethylene     |
- 12. Photorespiration will be more in:**
- |          |            |
|----------|------------|
| A. Maize | B. Sorghum |
| C. Wheat | D. Millets |
- 13. Nitrate assimilation mainly occurs in:**
- |         |                    |
|---------|--------------------|
| A. Root | B. Leaves          |
| C. Stem | D. All plant parts |
- 14. Plants have passive absorption mainly for:**
- |                        |                 |
|------------------------|-----------------|
| A. Cations             | B. Anions       |
| C. Uncharged molecules | D. Electrolytes |
- 15. The length of photoperiod affects:**
- |                      |                    |
|----------------------|--------------------|
| A. Leaves production | B. Stem elongation |
| C. Rooting depth     | D. Flowering       |
- 16. The Arabic word for extension is**
- |                  |                 |
|------------------|-----------------|
| A. Al-Ershad     | B. Beratung     |
| C. Vulgarisation | D. Voorlichting |
- 17. The main aim of extension according to Ray (2011) is :**
- |                               |                           |
|-------------------------------|---------------------------|
| A. Human Resource Development | B. Behavioral change      |
| C. Administrative management  | D. Leadership development |
- 18. Paradigm of extension typically focusing on advisory work is:**
- |                               |                                |
|-------------------------------|--------------------------------|
| A. Persuasive + Paternalistic | B. Persuasive + participatory  |
| C. Persuasive + Educational   | D. Educational + Participatory |
- 19. ....classified extension teaching methods according to their use.**
- |                   |                      |
|-------------------|----------------------|
| A. Seeman A Knapp | B. Ensinger          |
| C. Curt Lewin     | D. Wilson and Gallup |



20. Flag method is considered as ..... method according to form and result demonstration is a .....method.  
A. Visual, Spoken  
B. Spoken, Visual  
C. Visual, Group  
D. Individual, Spoken
21. .... refers to the perceived degree of expertise and trustworthiness according to a source by its audience at a given time and .....refers to the ability of an individual to reach a desired goal.  
A. Competence, Credibility  
B. Knowledge, Aim  
C. Credibility, Competence  
D. Learning, Aim
22. Three communication characteristics of flash cards are:  
A. Sequence, Suspense, Story- telling  
B. Source, Message, Channel  
C. Only B  
D. Clear, Contrast, communicable
23. When a person is involved in iconic experiences, learning occurs through  
A. Active participation  
B. Observation  
C. Abstract thinking  
D. Doing
24. ATMA Governing Board is a/an ..... and members of Governing Board of ATMA are appointed for the period of .....  
A. Administrative body only, two years  
B. Governing body, two years  
C. Advisory body, two years  
D. All of the above
25. Extension when used as a policy instrument for achieving societal objective is referred to as :  
A. Informative Extension  
B. Emancipatory Extension  
C. Broad-based Extension  
D. Persuasive Extension
26. The World Trade Organization was established in:  
A. 1997  
B. 1995  
C. 1993  
D. 1990
27. The market equilibrium for a commodity is determined by:  
A. The market supply of the commodity  
B. The market demand for the commodity  
C. The balancing of the farces of demand and supply for the commodity  
D. Any of the above.

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37. The short period in relation to a firm's production decision is:
- Less than one month
  - Less than one year
  - Two to five years
  - No fixed length of time
38. In mixed farming share of income from livestock enterprise ranges between:
- 1 to 9 per cent
  - 10 to 49 per cent
  - 50 to 79 per cent
  - 80 to 99 per cent
39. If only part of the labour force employed by a firm can be dismissed at any time and without pay, the total wages and salaries paid out by the firm must be considered:
- A fixed cost
  - A variable cost
  - Partly a fixed and partly a variable cost
  - Any of the above.
40. All of the following curves are U-shaped except:
- The AVC curve
  - The AFC curve
  - The AC curve
  - The MC curve
41. The density of pest population at which control measures should be applied-
- GEL
  - EIL
  - ETL
  - DB
42. Which of the fly is the pest of cotton-
- fruit fly
  - whitefly
  - stem fly
  - sawfly
43. Bunchy top of sugarcane symptom is appeared due to attack of :
- Top borer
  - Root borer
  - Early shoot borer
  - Pyrilla
44. The device fitted at the end of the spray lance and is used for atomization is-
- Hose
  - Cut-off device
  - Boom
  - Nozzle
45. The nozzle used for spray of herbicides-
- hollow cone nozzle
  - solid cone nozzle
  - Flat fan nozzle
  - all of the above
46. Which of following insect infests the grains in the field and then comes to storage-
- Ephestia* sp.
  - Tribolium castaneum*
  - Sitotroga cerealella*
  - All of the above



47. Which of the following is the European bee species-  
A. *Apis dorsata* B. *Apis indica*  
C. *Apis mellifera* D. *Apis florae*
48. Which of the bee hive is more popular in India-  
A. Thompson hive B. Newton hive  
C. Dadant hive D. Langstroth hive
49. Which of the following produces more lac and is important for commercial production-  
A. Male B. female  
C. Nymph D. All of the above
50. The host of *Bombyx mori* is:  
A. Mulberry B. Castor  
C. Arjun D. all of the above
51. Which one of the following is a rust fungus?  
A. *Uncinulla* B. *Sclerospora*  
C. *Uromyces* D. *Taphrina*
52. Silicon is known to be involved in rice resistance against:  
A. Blast B. Brown spot  
C. Sheath blight D. Sheath rot
53. Ug99 is the race of  
A. *Puccinia striiformis tritici* B. *Puccinia graminis tritici*  
C. *Puccinia recondite tritici* D. *Puccinia hordei*
54. Downy mildew diseases are managed by:  
A. Propiconazole B. Hexaconazole  
C. Metalaxyl D. Carbendazim
55. Majority of the plant viruses have a genome of :  
A. Negative sense ssRNA B. Positive sense ssRNA  
C. Negative sense dsRNA D. Positive sense dsRNA
56. Sesamum phyllody is caused by  
A. Virus B. Phytoplasma  
C. Virusoids D. Spiroplasma



**57. Late blight disease of potato is a:**

- A. Soil borne
- B. Air borne
- C. Seed borne
- D. Soil, seed and air borne

**58. Cracking, browning of the fleshy tissues and dropping of fruits from the tree is due to the deficiency of :**

- A. Zinc
- B. Boron
- C. Iron
- D. Calcium

**59. Bacterium which parasitizes more than hundreds of nematode species:**

- A. *Pasteuria*
- B. *Bacillus*
- C. *Pseudomonas*
- D. *Clavibacter*

**60. Which one of the following is a heat resistant antibiotic?**

- A. Chloramphenicol
- B. Streptocycline
- C. Penicillin
- D. Tetracycline

**61. Maize is a**

- A. Cross pollinated crop
- B. Self pollinated crop
- C. Self-incompatible crop
- D. Asexually propagated crop

**62. Which of the cell components is referred as 'power house' of cell**

- A. Chloroplast
- B. Mitochondria
- C. Lysosomes
- D. Nucleus

**63. Single cross hybrids are**

- A. Homogeneous and heterozygous
- B. Heterogeneous and heterozygous
- C. Homogeneous and homozygous
- D. Heterogeneous and homozygous

**64. Pure line variety is developed in**

- A. Cross pollinated crops
- B. Self-pollinated crops
- C. Both 'A & B'
- D. Neither 'A' nor 'B'

**65. A plant with four copies of basic chromosome number is called**

- A. Diploid
- B. Hexaploid
- C. Tetraploid
- D. Triploid

**66. Which of the cell components contained hereditary material?**

- A. Ribosome
- B. Golgi Body
- C. Endoplasmic reticulum
- D. Nucleus

67. What will be typical monohybrid phenotypic ratio in F<sub>2</sub> population in case of co-dominance?
  - A. 9:3:3:1
  - B. 3:1
  - C. 1:2:1
  - D. 1:1
68. Mendel's Laws of heredity were rediscovered in the year
  - A. 1865
  - B. 1866
  - C. 1901
  - D. 1900
69. Mutation that leads to replacement of a purine for a pyrimidine base and vice versa are called
  - A. Transition
  - B. Transversion
  - C. Inversion
  - D. Conversion
70. Exchange of genetic materials between non-sister chromatids of a homologous chromosome is referred as
  - A. Crossing over
  - B. Linkage
  - C. Mutation
  - D. None of these
71. The book 'An Agriculture Testament' was written by:
  - A. Sir Albert Howard
  - B. Dr. C.L. Acharya
  - C. Dr. N.E. Borlough
  - D. Narayan Rao Pandhari Pande
72. The world's biggest market for organic produce is:
  - A. Switzerland
  - B. US
  - C. Germany
  - D. UK
73. Microbial agent used in insect control
  - A. Tricoderma
  - B. Pseudomonas
  - C. Metarhizium
  - D. None of them
74. NPV is-
  - A. Virus
  - B. Bacteria
  - C. Fungi
  - D. Actinomycetes
75. Which of following is an egg parasitoid-
  - A. *Bacillus thuringensis*
  - B. Pseudomonas
  - C. Tricoderma
  - D. Trichogramma
76. Mycorrhizae is the symbiotic association between
  - A. Fungi and Algae
  - B. Fungi and Bacteria
  - C. Fungi and Actinomycetes
  - D. Fungi and Roots of higher plants

77. **Biodynamic concept was given by**  
A. J.I. Rodale  
B. Albert Haward  
C. Rudolf Steiner  
D. North Bourne
78. **In India accreditation agency authorizing to certifiers**  
A. Coffee Board  
B. Spices Board  
C. Tea Board  
D. All of these
79. **Which country is highest organic cotton producer?**  
A. China  
B. India  
C. US  
D. Switzerland
80. **Organic certification is**  
A. Process certification  
B. Product certification  
C. Grain certification  
D. Residue analysis
81. **Decomposition of organic matter and synthesis of new organic substances is called**  
A. Composting  
B. Humification  
C. Gypsification  
D. Calcification
82. **In moist, warm, well aerated soils the dominant form of nitrogen absorbed by plants is**  
A. Ammonium  
B. Nitrite  
C. Nitrate  
D. Amide
83. **The total pore space is more in**  
A. Clay loam soil  
B. Silty loam  
C. Loam  
D. Sandy soil
84. **Horizontal layers in the soil profile are known as**  
A. Soil coloumn  
B. Soil horizons  
C. Rhizosphere  
D. Rhizoplane
85. **The highest percentage of N among following N fertilizers is in**  
A. Di-ammonium phosphate  
B. Urea  
C. Ammonium nitrate  
D. Farm yard Manure
86. **Number of recognized land capability classes given by Soil Conservation Service of USA is**  
A. IV  
B. VIII  
C. V  
D. X

- 87. Downward movement of water through the soil profile is called as**
- |                 |                     |
|-----------------|---------------------|
| A. Percolation  | B. Water absorption |
| C. Water intake | D. Water quotient   |
- 88. The macronutrients are**
- |                                       |                                    |
|---------------------------------------|------------------------------------|
| A. Phosphorus, Potassium and Nitrogen | B. Nitrogen, Phosphorus and Sulfur |
| C. Calcium, Magnesium and Sulfur      | D. Copper, Nitrogen and Boron      |
- 89. In composting the temperature in the centre of pit during thermophilic phase is**
- |            |              |
|------------|--------------|
| A. 25-40°C | B. Below 0°C |
| C. 40-65°C | D. 10-20°C   |
- 90. Denitrifying microbes are**
- |                       |                    |
|-----------------------|--------------------|
| A. Anaerobic          | B. Aerobic         |
| C. Facultative aerobe | D. Microaerophilic |
- 91. Which of the following irrigation methods has maximum water use efficiency?**
- |                     |                |
|---------------------|----------------|
| A. Ridge and Furrow | B. Sprinkler   |
| C. Drip             | D. Check basin |
- 92. Which one of the following pulse crop has highest protein content in seeds?**
- |         |           |
|---------|-----------|
| A. Gram | B. Lentil |
| C. Urd  | D. Pea    |
- 93. Which one of the following is a tropical climate crop?**
- |              |            |
|--------------|------------|
| A. Sugarcane | B. Wheat   |
| C. Gram      | D. Mustard |
- 94. Organic crop production and animal husbandry is collectively known as:**
- |                   |                      |
|-------------------|----------------------|
| A. Mixed cropping | B. Companion farming |
| C. Relay cropping | D. Mixed farming     |
- 95. The main cause of sterility in the rice is...**
- |                     |                    |
|---------------------|--------------------|
| A. High temperature | B. Low temperature |
| C. Low humidity     | D. High humidity   |
- 96. The meaning of monsoon is:**
- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| A. Rainfall from south-west direction | B. Precipitation during kharif season |
| C. High amount of precipitation       | D. Seasonal reversal of wind pattern  |



97. National Bureau of Agricultural Insect Resources (NBAIR) is located at:
- A. New Delhi
  - B. Bengaluru
  - C. Tamil Nadu
  - D. Hyderabad
98. One quintal wheat seed is to be treated for loose smut control with fungicide Vitavax, the fungicide requirement would be
- A. 100 g
  - B. 250 g
  - C. 500 g
  - D. 1000 g
99. A blue triangle on a fungicide packet indicates the toxicity level as
- A. Extremely toxic
  - B. Highly toxic
  - C. Moderately toxic
  - D. Slightly toxic
100. Lime is used as amendment to reclaim
- A. Saline soil
  - B. Saline-alkali soil
  - C. Calcareous soil
  - D. Acid soil

## SECTION- B

### **I. ANSWER ALL QUESTIONS**

**[100 Marks]**

1. What are the criteria of essentiality of nutrients for the plants? Suggest measures to increase nutrient use efficiency. (10)

OR

Describe soil moisture depletion approach for scheduling irrigation. Write advantages and disadvantages of check basin method of irrigation.

2. What are the several participatory approaches of Agricultural Extension (Explain any one of those)? Can ATMA and KVK fulfill the need of the participation in the emerging context of agricultural extension? (If Yes, suggest a restructured model and if No, illustrate the problems through problem tree analysis). (10)
3. Describe the types of risk prevailing in Indian agriculture. Suggest the strategies to be adopted by the farmer at his own and with the support of different institutions to minimize the risk. (10)

OR

What is diversified farming? Describe its merits and demerits.

4. Describe Law of segregation and Law of Independent Assortment taking examples of monohybrid and dihybrid cross. (10)

OR

Define Plant Breeding. Describe different mechanisms that promote cross pollination and self pollination in crops.

5. Define soil colloids and give their classification. What are the properties of layer-lattice alluminosilicates? Enlist the groups of alluminosilicates along with the at least one example and explain their structures. (10)
6. Differentiate between passive and active uptake in plants. (5)

OR

Write constraints of zero tillage in wheat.

7. What are the factors influencing the choice and effectiveness of extension teaching methods? How media forums can be effective in the present context? (5)

8. Extension approach in India is prescriptive than perspective. Justify the statement with suitable reasoning and illustrations. (5)
9. What are the sources of organic matter in soil? Explain the influence of soil organic matter on soil fertility and plant nutrition. (5)

OR

What are biofertilizers? Give the broad classification of biofertilizers along with the examples of microbes used and crop for which it is meant for.

- II. Briefly describe the following (2.5×4=10)
- Prospects of organic farming in the state of Sikkim
  - Organic ecosystem.
  - Principals of organic farming
  - Role of NGO's and Government organizations in the promotion of organic farming
- III. Define/describe **Any Ten** of the following: (2×10=20)
- Integrated Pest Management
  - Biological Control
  - Plant Disease
  - Plant disease triangle
  - Pure line theory
  - Pedigree selection
  - Cytoplasmic inheritance
  - Complementary gene action
  - Mass selection
  - ITC-E Choupal initiative.
  - Planning and budgeting of an agricultural farm
  - Pradhan Mantri Fasal Beema Yojana

## ROUGH WORK