

Sikkim Public Service Commission
Main Written Examination for the Post of Sub Inspector
PAPER - II AGRICULTURE

Time allowed: 3.00 Hrs

Maximum Marks: 250

INSTRUCTION TO CANDIDATES

Read the instructions carefully before answering the questions: -

- 1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS 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. Use only Black Ball Point Pen to fill the OMR Sheet.**
- 3. Do not write anything else on the OMR Answer Sheet except the required information.**
- 4. This Test Booklet contains 50 questions in MCQ Mode in Part I to be marked in OMR Sheet. Part II and Part III are Subjective Questions which have to be written on separate answer sheet provided to you.**
- 5. 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.**
- 6. 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 separate answer sheet to the Invigilator only. You are permitted to take with you the Test Booklet.**
- 7. Marking Scheme**

THERE WILL BE NEGATIVE MARKING FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTIONS

- 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 the 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

PART - I

Choose the correct answer for the following questions:

(3x50=150)

1. **How many tests in the lab can be performed to get permeability of soil?**
A. 5
B. 4
C. 3
D. 2

2. **Terracing is an effective method of soil conservation in:**
A. Desert areas
B. Hilly areas
C. Plains
D. Riverine areas

3. **Synthesis of RNA and proteins take place in _____**
A. M phase
B. S phase
C. G1 Phase
D. G2 phase

4. **Polyploidy can be artificially induced by _____**
A. Self-pollination
B. Line breeding
C. Inbreeding
D. Colchicine

5. **The characteristic indicated by the blackened figures is probably:**
A. Dominant.
B. Recessive.
C. Non-dominant.
D. Sex-linked recessive.

6. **Transmission of genes that occur outside nucleus is called**
A. Extranuclear inheritance
B. Cytoplasmic inheritance
C. Both A and B
D. None of above

7. **What is an apoenzyme?**
A. It is a protein portion of an enzyme
B. It is a non-protein group
C. It is a complete, biologically active conjugated enzyme
D. It is a prosthetic group

8. **What is the function of phosphorylase?**
A. Transfer inorganic phosphate
B. Transfer a carboxylate group
C. Use H_2O_2 as the electron acceptor
D. Transfer amino group
9. **Phases of Calvin cycle involves**
A. Carbon fixation
B. Reduction
C. Regeneration
D. All of Above
10. **Process of photosynthesis cannot occur in absence of**
A. Oxygen
B. Carbon dioxide
C. Carbon monoxide
D. Nitrogen
11. **How long do patents usually last for?**
A. 10 years
B. 20 years
C. 30 years
D. 60 years
12. **The critical time period for Hyoscyamus is less than:**
A. 12
B. 14
C. 10
D. 15
13. **ABO blood group system is due to**
A. Multifactor inheritance
B. Incomplete dominance
C. Multiple allelism
D. Epistasis.
14. **When starch and amylase are mixed in the presence of iodine solution, the blue-black colour rapidly disappears. This is due to the formation of which molecule?**
A. Glucose
B. Glycogen
C. Sucrose
D. Maltose
15. **The allosteric inhibitor of an enzyme**
A. Causes the enzyme to work faster
B. Binds to the active site
C. Participates in feedback regulation
D. Denatures the enzyme

16. **Phosphorylase a + 2H₂O → phosphorylase b + 2P_i**
Which of the following is false about this reaction?
A. Phosphorylase a is less active and phosphorylase b is more active
B. Glycogen phosphorylase catalyzes this reaction
C. Phosphorylase b can be transformed back into phosphorylase a by phosphorylase kinase
D. Phosphorylase kinase catalyzes the transfer of phosphoryl groups from ATP to phosphorylase b
17. **Which of the following is false?**
A. Allosteric modulators may be inhibitory or stimulatory
B. Based on the nature of modulator, allosteric enzymes are of two types
C. Homotropic allosteric enzymes have the substrate and modulator same
D. Heterotropic allosteric enzymes have the substrate and modulator same
18. **The price at which the government offers to sell foodgrains lower than the market price is known as?**
A. Procurement price
B. Minimum support price
C. Issue price
D. Market price.
19. **Which one of these is not a valid reason for food security in India?**
A. Overpopulation
B. Hoarding and black marketing
C. Food grains stores are overflowing with food grains
D. None of these.
20. **What does food security mean?**
A. Availability of food
B. Accessibility of food
C. Availability and accessibility of food to all at all times.
D. Availability, accessibility and affordability of food to all at all the times.
21. **Exclusion of plant disease by legislation is known as:**
A. Disease resistance
B. Plant quarantine
C. Biological control of plant
D. Cultural control
22. **Damage and errors in DNA cause_____**
A. Mutation
B. DNA repair
C. Translation
D. Transcription

23. Which of the following is NOT a type of reverse mutation?
A. Back mutation
B. Intergenic suppressor mutation
C. Intragenic suppressor mutation
D. Missense mutation
24. Which of the following chemical mutagen affects only replicating DNA?
A. Acridine dye
B. Alkylating agent
C. Deaminating agent
D. Base analog
25. Light dependent stage cannot be carried out without
A. Oxygen
B. Carbon dioxide
C. Water
D. All of these
26. Plant can be destarched in
A. 14 hours
B. 24 hours
C. 42 hours
D. 48 hours
27. Light dependent stage cannot be carried out without
A. Oxygen
B. Carbon dioxide
C. Water
D. All of these
28. Which among the following sentence is TRUE about C3 plants?
A. Photosynthetically more efficient
B. More efficient in CO₂ fixation than C4 plants
C. PEPCO is present in mesophyll
D. First stable product is phosphoglyceric acid
29. C4 pathway is shown by
A. Sugar cane
B. Sunflower
C. Pea
D. Rice
30. Carbon becomes available to crop plants in the form of
A. Amino acids
B. Carbonates
C. CO₂
D. Elemental C

31. **A method of breeding most commonly used when the desired variation is required to be induced in a vegetatively propagated crop is:**
A. Polyploidy
B. Pedigree method of breeding
C. Mutation breeding
D. Backcross method of breeding
32. **A plant breeder is interested to control pollination to:**
A. Prevent cross-pollination
B. Control pollination
C. None of these
D. Both of these
33. **A restorer gene is present in:**
A. Nucleus
B. Cytoplasm
C. Both (a)&(b)
D. None of these
34. **In deamination, amino acid is converted into**
A. Aldol acid
B. Keto acid
C. Hydrochloric acid
D. Carboxylic acid
35. **Transamination is catalyzed by**
A. Transferases
B. Aminotransferases
C. Hydrogenases
D. Dehydrogenases
36. **Brain gets energy from ketone bodies if availability of glucose is**
A. Constant
B. Less
C. High
D. Zero
37. **Nature of anabolism reaction is**
A. Exergonic
B. Endergonic
C. Spontaneous
D. Non spontaneous

38. **An X linked recessive gene would appear to _____**
A. Be expressed in both males and females equally
B. Skip generations
C. Be lethal
D. Gradually degrade
39. **Choose the odd one out.**
A. Colour blindness
B. Haemophilia
C. Duchenne muscular dystrophy
D. Faulty tooth enamel
40. **Yellow Colour in turmeric is cause due to the presence of**
A. Boron
B. Curcumin
C. Iron
D. Comoplastid
41. **_____ is not an insecticide**
A. Parathion
B. Sodium Chlorate
C. Aldrin
D. Methoxychlor
42. **_____ is not a kharif crop**
A. Mustard
B. Jowar
C. Paddy
D. Soyabean
43. **Which State is the largest producer of rice**
A. Uttar Pradesh
B. West Bengal
C. Punjab
D. Andhra Pradesh
44. **The process of expression of foreign genes in a plant is called _____**
A. Gene expression
B. Transgenesis
C. Genetic transformation
D. Cell hybridization
45. **Name the marker gene of streptomycin?**
A. HPT
B. SPT
C. PAT
D. BXN

46. **Name the first transgenic virus resistant plant?**
A. Rice
B. Cotton
C. Tobacco
D. Tomato
47. **Name the enzyme which has silenced to delay the ripening process?**
A. Polygalacturonase
B. Glyphosate
C. ADA
D. P53
48. **Name the strategy where two-plasmid system is used for the introduction of the gene?**
A. Binary vector system
B. Co-integration vector strategy
C. Agrobacterium
D. Selectable marker strategy
49. **With an increase in seed size upon germination, dry mass of seeds**
A. Increases
B. Decreases
C. Vanishes
D. Grows proportionally with seed
50. **Dormant seeds are usually**
A. succulent
B. dry
C. wet
D. soft

PART - II

ANSWER ANY TWO OF THE FOLLOWING QUESTIONS: (25X2=50)

1. What are the various national and international food policies?
2. Write short note on C3 cycle.
3. What is the importance of cytoplasmic inheritance?
4. Discuss the importance of genetically modified crops?
5. What are molecular markers. Discuss their importance in plant improvement?

PART - III

WRITE SHORT NOTES ON ANY FIVE OF THE FOLLOWING: (10X5=50)

1. What are the advance tools for ecosystem analysis?
2. Discuss soil erosion and its management?
3. Describe the various cropping patterns in different agro- climatic zones of India?
4. What is the role of Krishi Vigyan Kendra in dissemination of agricultural technologies?
5. Differentiate between sex-influenced and sex-limited characters?
6. Discuss the role of inter specific and inter generic hybridization.
7. Write short notes on
 - a. Photoperiodism
 - b. Vernalization
8. Describe the various plant Quarantine measures.