

Sikkim Public Service Commission

Written (Main) Examination for the post of Sub-Jailer

Time Allowed: 3 hours

PAPER - II
BOTANY

Maximum Marks: 250

INSTRUCTIONS TO CANDIDATES

Read the instructions carefully before answering the questions: -

1. This Test Booklet consists of 8 (eight) pages and has 63 (sixty-three) printed questions.
2. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET DOES NOT HAVE ANY UNPRINTED, TORN OR MISSING PAGES OR ITEMS. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
3. Use only Black Ball Point Pen to fill the OMR Sheet.
4. Please note that it is the candidate's responsibility to fill in the Roll Number carefully without any omission or discrepancy at the appropriate places in the OMR ANSWER SHEET as well as on SEPARATE ANSWER BOOKLET for Conventional Type Questions. Any omission/discrepancy will render the Answer Sheet liable for rejection.
5. Do not write anything else on the OMR Answer Sheet except the required information. Before you proceed to mark in the OMR Answer Sheet, please ensure that you have filled in the required particulars as per given instructions.
6. This Test Booklet is divided into 3 (three) parts - **Part-I, Part-II and Part-III.**
7. All three parts are **Compulsory.**
8. **Part-I consists of Multiple-Choice Questions.** The answers for these questions have to be marked in the OMR Answer Sheet provided to you.
9. **Parts II and III consist of Conventional Type Questions.** The answers for these questions have to be written in the **Separate Answer Booklet** provided to you.
10. After you have completed filling in all your responses on the OMR Answer Sheet and the Answer Booklet(s) and the examination has concluded, you should hand over the OMR Answer Sheet and the Answer Booklet(s) to the Invigilator only. You are permitted to take the Test Booklet with you.
11. **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
(Multiple Choice Questions)

Choose the correct answer for Questions 1 to 50 from the given options. Each question carries 3 marks.
[50 x 3 = 150]

1. Who found out by demonstration that life originated from pre existing cells?
 - (a) Stanley
 - (b) Charles Darwin
 - (c) Hugo de Vries
 - (d) Louis Pasteur
2. Phages which show lysogenic cycle are called:
 - (a) Temperate
 - (b) Lytic
 - (c) Virulent
 - (d) None of the above
3. Red rust of tea is caused by:
 - (a) Puccinia
 - (b) Cephaleuros
 - (c) Ectocarpus
 - (d) Sargassum
4. Which of the following has the ability to fix atmospheric nitrogen?
 - (a) Red algae
 - (b) Blue-green algae
 - (c) Brown algae
 - (d) Chlorella
5. Corophilous fungi grow on:
 - (a) Dung
 - (b) Wood
 - (c) Grass
 - (d) Animals
6. Hypertrophy means:
 - (a) Increase in size of affected part
 - (b) Decrease in size
 - (c) Both of the above
 - (d) None of the above
7. Which of the following statements is not correct for byrophytes?
 - (a) They lack tracheids and vessels
 - (b) They are photosynthetic
 - (c) Their zygote undergoes meiosis and then produces the sporophyte
 - (d) Their spores germinate and produce gametophytes
8. Which of the following is the earliest pteridophyte?
 - (a) Rhynia
 - (b) Selaginella
 - (c) Equisetum
 - (d) Marsilea
9. In a form genus the suffix carpon signifies the name of a:
 - (a) Cone
 - (b) Stem
 - (c) Seed
 - (d) Microsporangia
10. Gnetum is found in India in:
 - (a) Sikkim and Assam
 - (b) Central and northern Himalayas
 - (c) Central India
 - (d) Cultivated gardens
11. 'Taxol' is obtained from:
 - (a) Taxus
 - (b) Pinus
 - (c) Gnetum
 - (d) Cycas
12. The size of a herbarium sheet is:
 - (a) 13 x 16 inches
 - (b) 7 x 9 inches
 - (c) 4 x 5 inches
 - (d) 11.5 x 16.5 inches

13. Which one of the following is not an adaptation for cross-pollination?
- (a) Self-sterility
 - (b) Dichogamy
 - (c) Herkogamy
 - (d) Cleistogamous flower
14. Who reported the process of fertilization for the first time?
- (a) Strasburger
 - (b) Hoffmeister
 - (c) Linnaeus
 - (d) Bauhin
15. Plants that grow in nitrogen deficient soil are called as:
- (a) Epiphytes
 - (b) Insectivorous
 - (c) Saprophytes
 - (d) Parasites
16. Aerosols are released by:
- (a) Industries
 - (b) Jet planes
 - (c) SO₂ pollution
 - (d) All of the above
17. Which hormone is responsible for seed dormancy?
- (a) Ethylene
 - (b) Auxin
 - (c) Cytokinin
 - (d) Abscisic acid
18. Respiration quotient of carbohydrates is:
- (a) 1
 - (b) >1
 - (c) <1
 - (d) 0 (zero)
19. Oxygen liberated during photosynthesis comes from:
- (a) Water
 - (b) Carbon dioxide
 - (c) Chlorophyll
 - (d) Phosphoric acid
20. First stable product of carbon assimilation is:
- (a) Glucose
 - (b) Pyruvic acid
 - (c) Starch
 - (d) Phosphoglycerate
21. Acetyl CoA forms a 6-C compound after combining with
- (a) Malic acid
 - (b) α - ketoglutaric acid
 - (c) Oxaloacetic acid
 - (d) Citric acid
22. The membrane around the vacuole is known as:
- (a) Elioplast
 - (b) Tonoplast
 - (c) Fragmoplast
 - (d) Cytoplast
23. A cell without a cell wall is referred to as:
- (a) Tonoplast
 - (b) Symplast
 - (c) Apoplast
 - (d) Protoplast
24. Lysosomes are known as "suicidal bags" because of:
- (a) Hydrolytic activity
 - (b) Presence of food vacuole
 - (c) Catalytic activity
 - (d) Parasitic activity
25. Late prophase of mitosis is characterized by:
- (a) Condensation of chromosomes
 - (b) Division of centromere
 - (c) Formation of metaphasic plate
 - (d) Disappearance of centromere
26. Sporophytic phase is dominant in:
- (a) Algae
 - (b) Pteridophytes
 - (c) Fungi
 - (d) Bryophyte

27. Who coined the term "Ecology?"
- Brown
 - Reiter
 - Khurana
 - Aristotle
28. The living organisms in and around the earth constitute the ____.
- Biome
 - Biosphere
 - Community
 - Biocoenosis
29. "Shower of Sulphur" in hilly area arises by:
- Pollens
 - Yellow dust
 - Sulphur dust
 - Yellow flower
30. "Chilgoza" dry fruit is obtained from which species of pinus?
- P. roxburghii*
 - P. wallichiana*
 - P. gerardiana*
 - None of the above
31. Fibers and sclerids constitute:
- Parenchyma
 - Sclerenchyma
 - Collenchymas
 - Chlorenchyma
32. Small plants with life span of one year is referred to as:
- Biennials
 - Perennials
 - Annuals
 - None of the above
33. The plants which can survive in very small amount of soil, even in crevices of rocks are known as:
- Psychrophytes
 - Epiphytes
 - Chasmophytes
 - Parasites
34. Who proposed the Histogen Theory for shoot system?
- Hanstein
 - Derman
 - Nageli
 - Steward
35. A prokaryotic cell differs from eukaryotic cell due to the lack of:
- Nucleolus
 - Nuclear membrane
 - Membranous organelles
 - All of the above
36. The theory of abiogenesis is also known as:
- Theory of survival
 - Germplasm theory
 - Theory of spontaneous generation
 - Oparin-Haldane theory
37. Plants absorb N_2 in the form of:
- Nitrates
 - Ammonium
 - Nitrites
 - All of the above
38. Symbiotic N_2 fixing cyanobacteria are present in all except:
- Azolla*
 - Gnetum*
 - Cycas*
 - Anthoceros*
39. Wart disease of potato is caused by:
- Synchytrium endobioticum*
 - Sclerospora graminicola*
 - Albugo candida*
 - Erysiphe graminis*
40. The Irish Potato famine which occurred in North Europe during 1845 was caused by:
- Alternaria solani*
 - Phytophthora infestans*
 - Synchytrium endobioticum*
 - Erhwinia carotovora*

41. Disease control of red rot of sugarcane is:
(a) Healthy sett section
(b) Field sanitation and crop rotation
(c) Use of resistant varieties like Co 846
(d) All of the above
42. The correct sequence of parts of female reproductive organ in plants:
(a) Ovary, style, thalamus, stigma
(b) Ovary, stigma, style, thalamus
(c) Stigma, style, ovary, thalamus
(d) Style, stigma, ovary, thalamus
43. Fruits are mature _____ whereas seeds are mature _____.
(a) Ovules and carpels
(b) Ovaries and avulse
(c) Ovules and ovaries
(d) Ovaries and stamens
44. What is the main causative factor of desertification?
(a) Tourism
(b) Developmental activities
(c) Overgrazing
(d) Irrigated agriculture
45. Ephemerals are:
(a) Drought enduring plants
(b) Drought resistant plants
(c) Drought evading plants
(d) Drought escaping plants
46. In India coniferous forests are found in:
(a) Himalayas
(b) Western Ghats
(c) Eastern Ghats
(d) All of the above
47. The meiotic division takes place in:
(a) Meristematic cells
(b) Reproductive cells
(c) Vegetative cells
(d) Conductive cells
48. Continuous variations are due to:
(a) Mutation
(b) Polyploidy
(c) Crossing over
(d) Chromosomal aberration
49. The by-product of photosynthesis is:
(a) CO₂
(b) Energy
(c) O₂
(d) Glucose
50. Solute potential is always:
(a) Positive
(b) Zero
(c) One
(d) Negative

PART - II**(Conventional Type Questions)**

Answer any 2 (two) from Questions 51 to 55. Each question carries 25 marks.

[2 x 25 = 50]

51. Describe the vegetative methods of reproduction in Algae.
52. Discuss C4 cycle of Hatch and Slack cycle in plant. Write the difference between C3 and C4 cycles.
53. Give an illustrated account of "white rust disease of crucifers" with symptoms, casual organism, disease cycle and disease control mechanism.
54. Give the details about merits and demerits of the system of classification presented by George Bentham & Hooker.
55. Write about the abiotic factors of an Ecosystem.

PART - III**(Conventional Type Questions)**

Answer any 5 (five) from Questions 56 to 63. Each question carries 10 marks.

[5 x 10 = 50]

56. Explain about the elements of xylem with the help of a diagram.
57. Describe the process of plant identification.
58. What do you understand by alteration of generations? Explain it in homosporous species with examples in pteridophytes.
59. Give the ultra-structure of ribosomes with its functions.
60. Write a short note on entry of pollen tube into ovule.
61. Describe the physiological effects of auxins and cytokinins in plants.
62. Discuss the glycolysis reactions by outline diagram.
63. Write a short note on polyploidy.

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