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Part III — BIOLOGY

(English Version)

Time Allowed : 3 Hours]

[Maximum Marks : 150

N. B. : Candidates should answer **Part - I** (Botany) & **Part - II** (Zoology) in separate answer-books.

PART - I (BOTANY)

(Marks : 75)

SECTION - A

Note : i) Answer *all* the questions.

ii) Choose and write the correct answer.

iii) Each question carries *one* mark.

 $14 \times 1 = 14$

1. Dr. M. S. Swaminathan Research Institute is situated at
 - a) New Delhi
 - b) Mumbai
 - c) Chennai
 - d) Lucknow.
2. The pentose phosphate pathway takes place in
 - a) chloroplast
 - b) peroxisome
 - c) mitochondrion
 - d) cytoplasm.
3. When the bulb of onion is cut, it releases a lacrymatory substance called
 - a) acalyphine
 - b) allicin
 - c) atropine
 - d) stramonium.

[Turn over

4. The carbon dioxide acceptor molecule in the bundle sheath cells of C_4 plants is

- a) Phosphoenol pyruvic acid
- b) Ribulose biphosphate
- c) Oxaloacetic acid
- d) Pyruvic acid.

5. Nullisomy is represented by

- a) $2n - 1$
- b) $2n + 1$
- c) $2n + 2$
- d) $2n - 2$.

6. The rice Tungro virus is transmitted by

- a) mosquitoes
- b) aphids
- c) leaf hoppers
- d) ants.

7. *Agrobacterium tumefaciens* causes

- a) Crown gall disease
- b) Tungro disease
- c) Tikka disease
- d) Blight disease.

8. The hormone which promotes positive geotropic growth in roots is

- a) auxin
- b) gibberellin
- c) ethylene
- d) cytokinin.

9. The companion cells are present in

- a) Bryophytes
- b) Pteridophytes
- c) Gymnosperms
- d) Angiosperms.

10. The metacentric chromosomes are

- a) V-shaped
- b) L-shaped
- c) J-shaped
- d) Circular.

11. *Thespesia populnea* is a

- a) tree
- b) shrub
- c) herb
- d) herb with bulb.

- ## SECTION - B

ii) Each question carries three marks.

15. What is soil reclamation ?
16. With examples, write any three types of inflorescence seen in the plants of Euphorbiaceae.
17. Draw the structure of *t* RNA and label the parts.
18. Write the systematic position of potato family.
19. What is restriction endonuclease ?
20. Draw the ground plan for T.S. of Sunflower stem and label the parts.
21. Write in three sentences about the mesophyll of dicot leaf.
22. What are insectivorous plants ? Give an example.
23. Respiratory quotient of glucose in anaerobic respiration is infinity. Give reasons.
24. What is photophosphorylation ?

SECTION - C

Note : i) Answer any four questions including Question No. 25 which is compulsory.

ii) Draw diagrams wherever necessary.

iii) Each question carries five marks.

$4 \times 5 = 20$

25. Write the economic importance of members of Malvaceae.
26. Give a brief account on tikka disease of groundnut.
27. With the help of diagrams, describe the structure of polytene and lampbrush chromosomes.
28. Bring out any five significances of photosynthesis.
29. Explain the experiment to measure growth in length of a plant.
30. What is single cell protein ? State any three uses of single cell protein.
31. With examples, explain the structure of concentric vascular bundles.

SECTION - D

Note : i) Answer any two questions.

ii) Draw diagrams wherever necessary.

iii) Each question carries ten marks.

$2 \times 10 = 20$

32. With the help of flowchart, discuss Bentham and Hooker's classification of plants.
33. Describe the reactions of Krebs cycle. (Explanation or flowchart)
34. Discuss the basic techniques of plant tissue culture. (Diagram not necessary)
35. With the help of diagram, describe the anatomy of dicot stem.

PART - II (ZOOLOGY)

(Marks : 75)

SECTION - A

Note : i) Answer all questions.

ii) Choose and write the correct answer.

iii) Each question carries one mark.

16 × 1 = 16

1. The chromosomes 4 and 5 belong to the group classified by karyotyping
 - a) A
 - b) B
 - c) C
 - d) D.
2. In Proteomics, the amino acid sequences are read by
 - a) Haemocytometer
 - b) Glucometer
 - c) Thermometer
 - d) Sequenators.
3. Which of the following gases destroys ozone layer faster ?
 - a) Chlorofluorocarbons
 - b) Hydrochlorofluorocarbons
 - c) Both (a) and (b)
 - d) Sulphur dioxide.
4. Which of the following provides about 95% of all commercial energy in the world ?
 - a) Sunlight
 - b) Nuclear energy
 - c) Petroleum, natural gas and coal
 - d) Water power.
5. The gall stones are formed of
 - a) calcium
 - b) growing infected tissue
 - c) cholesterol
 - d) sodium crystals.
6. Urea biosynthesis takes place in
 - a) pancreas
 - b) kidney
 - c) liver
 - d) stomach.

7. Which is called artificial kidney ?
- a) Donor kidney
 - b) Dializer
 - c) Tissue-matched kidney
 - d) Preserved kidney.
8. Excessive exposure to UV-rays can cause
- a) vomiting
 - b) redness of eyes
 - c) colour change
 - d) skin cancer.
9. Which one of the following is an example for contagious disease in cattle ?
- a) Constipation
 - b) Milk fever
 - c) Cowpox
 - d) Diarrhoea.
10. The air breathing fish among the following is
- a) Mrigal
 - b) Mullet
 - c) Rohu
 - d) Cat fish.
11. The diluting fluid used to count RBC is
- a) Turk's solution
 - b) Hayem's solution
 - c) Toisson's solution
 - d) Lymphatic fluid.
12. Which one of the following is considered as raw materials for evolution ?
- a) Ploidy
 - b) Gene mutation
 - c) Change of environment
 - d) Natural selection.
13. Which one of the following is a protozoan disease ?
- a) Cholera
 - b) Measles
 - c) African sleeping sickness
 - d) Taeniasis.
14. The more promising chemotherapeutic agent for treating viral disease is
- a) Tetracycline
 - b) Ampicillin
 - c) Interferon
 - d) Anthramycin.

15. Pain during urination and a yellow discharge from the urethra of male are the symptoms of
- a) gastroenteritis
 - b) venereal syphilis
 - c) plague
 - d) gonorrhea.
16. Graft between identical twins is called
- a) Xenograft
 - b) Allograft
 - c) Autograft
 - d) Isograft.

SECTION - B

Note : i) Answer any *eight* questions.

ii) Each question carries *three* marks.

8 × 3 = 24

- 17. What is obesity ?
- 18. What is corpus luteum ?
- 19. Write the symptoms of cholera.
- 20. What is meant by Chicken Embryo Technique ?
- 21. Name the five classes of immunoglobulins.
- 22. Mention any two uses of Karyotyping of human chromosomes.
- 23. What is a database in bio-informatics ?
- 24. Define cloning.
- 25. List out the names of two bio-reserves in Tamil Nadu.
- 26. How will you identify a healthy cattle ?
- 27. What are the advantages of artificial insemination ?
- 28. Define 'Gene pool' .

SECTION - C

Note : i) Answer any three questions including Question No. 31 which is compulsory.

ii) Each question carries five marks.

3 × 5 = 15

29. Draw the V.S of human eye and label the parts.
30. Write the symptoms of AIDS, defined by WHO.
31. Give an account of immunodeficiency diseases.
32. What are the uses of recombinant DNA technology ?
33. Write a detailed account on Population Genetics.

SECTION - D

Note : i) Answer any two questions.

ii) Each question carries ten marks.

2 × 10 = 20

34. Enumerate the events involved in the function of the human heart.
35. Define bone fracture and explain the different types of bone fracture.
36. Write an essay on common diseases of cattle.
37. How will you manage hazardous wastes ?