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Part III — BIOLOGY

(New Syllabus)

(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 × 1 = 14

- In tissue culture formation of roots from the callus is called
 - rhizogenesis
 - caulogenesis
 - hardening
 - incubation.
- In photorespiration, the organelle in which two molecules of glycine combine to form serine is
 - chloroplast
 - peroxisome
 - mitochondria
 - ribosome.
- Glycolysis occurs in
 - cytoplasm
 - mitochondria
 - chloroplast
 - peroxisome.

[Turn over

4. In which of the following reactions substrate level phosphorylation does not occur ?
- a) Glycolysis
 - b) Oxidative decarboxylation of pyruvic acid
 - c) Kreb's cycle
 - d) Citric acid cycle.
5. Sexual system of classification refers to
- a) artificial system
 - b) natural system
 - c) phylogenetic system
 - d) modern system.
6. Binomial system was introduced by
- a) Casparay
 - b) Carolus Linnaeus
 - c) Camp and Gilly
 - d) Gaspard Bauhin.
7. The plants of have mucilagenous substance.
- a) Liliaceae
 - b) Euphorbiaceae
 - c) Malvaceae
 - d) Solanaceae.
8. The tissue present in all organs of plant is
- a) Chlorenchyma
 - b) Parenchyma
 - c) Collenchyma
 - d) Sclerenchyma.
9. An example for green manure is
- a) Nitrosomonas
 - b) Mycorrhiza
 - c) Rhizobium
 - d) Sesbania.
10. Tungro disease of rice is caused by
- a) bacterium
 - b) virus
 - c) fungus
 - d) nematode.

11. Among the constituents of xylem, the living tissue is
- a) tracheae b) tracheids
c) xylem parenchyma d) xylem fibres.
12. The number of sex chromosomes found in human diploid cell is
- a) 2 b) 44
c) 46 d) 47.
13. The polytene chromosomes were first discovered by
- a) Bridges b) Waldeyer
c) Balbiani d) Flemming.
14. The enzyme which joins DNA fragments is
- a) DNA polymerase b) DNA ligase
c) helicase d) topoisomerase.

SECTION - B

Note : i) Answer any seven questions.

ii) Each question carries 3 marks.

7 × 3 = 21

15. What is a type specimen ?
16. Draw floral diagram for female flower of *Ricinus communis*.
17. What are passage cells ?
18. Draw diagram, for Brachysclereids and label the parts.
19. Draw different types of chromosomes based on shape and position of centromere.
20. How do bacteria protect themselves from the attack of viruses ?
21. What is photolysis of water ?
22. Write any three differences between photorespiration and dark respiration.
23. What is Richmond-Lang effect ?
24. What is heterosis ?

B

[Turn over

SECTION - C

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

ii) Draw diagrams wherever necessary.

iii) Each question carries 5 marks.

4 × 5 = 20

25. Write the importance of herbarium.
26. Draw a neat sketch of anatomy of sunflower leaf and label the parts.
27. Write any five significances of ploidy.
28. Describe with diagrams the action of restriction enzyme.
29. Explain cyclic photophosphorylation.
30. Explain respiratory quotient.
31. What is antibiotic ? Write any two names of antibiotics. State their uses.

SECTION - D

Note : i) Answer any *two* questions.

ii) Draw diagrams wherever necessary.

iii) Each question carries 10 marks.

2 × 10 = 20

32. Describe *Hibiscus rosasinensis* in technical terms.
33. Write the anatomical differences between the dicotyledonous stem and monocotyledonous stem.
34. Explain the basic techniques of plant tissue culture.
35. a) Write any five physiological effects of auxin. 5
- b) Describe with examples any two types of heterotrophic nutrition in angiosperms. 5

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 fertilized eggs are selected for the transfer of
 - a) whole nuclei
 - b) whole chromosome
 - c) DNA segment
 - d) some genes to cultured cells.
2. The persons suffering from sickle cell anaemia but survive have the genotype
 - a) Hb^S Hb^S
 - b) Hb^A Hb^S
 - c) Hb^A Hb^A
 - d) Hb Hb.
3. The most abundant greenhouse gas is
 - a) NO₂
 - b) O₂
 - c) CO₂
 - d) SO₂.
4. Which one of the following is considered as a future source of power that can meet our unlimited demand ?
 - a) Hydel power
 - b) Hydrogen power
 - c) Solar power
 - d) Thermal power.
5. The condition of wrinkled and carotinsed corneal epithellium is called
 - a) Xerosis
 - b) Xerophthalmia
 - c) Dementia
 - d) Osteomalacia.
6. The percentage of oxygen in the inhaled air is
 - a) 79.00
 - b) 0.04
 - c) 21.00
 - d) 15.70.

7. Which part of the brain aids in visual tracking of moving objects ?
- a) superior colliculi b) inferior colliculi
c) cerebellum d) primary motor area.
8. Graves' disease is otherwise known as
- a) Diabetes b) Thyrotoxicosis
c) Cretinism d) Dwarfism.
9. The milk fever is due to the inability of the animal to assimilate
from the feed.
- a) Magnesium b) Potassium
c) Phosphorus d) Calcium.
10. The cattle breeds belonging to dairy breed are
- a) Sindhi and Gir b) Kangayam and Siri
c) Hariana and Ongole d) Bos taurus.
11. The diluting fluid used for counting of WBC is
- a) Hayem's solution b) Turk's solution
c) Eosin solution d) Red litmus solution.
12. When the phenotypic features coincide with normal environmental situation the
selection is said to be
- a) stabilizing selection b) polymorphism
c) directional selection d) disruptive selection.
13. The production of scattered purplish lesions over the chest and abdomen is due
to
- a) Pernicious anaemia b) Pernicious malaria
c) Kaposi's Sarcoma d) Syphilis.
14. The diarrhoea in children is associated with
- a) Yersinia pestis b) Rabies
c) Giardia intestinalis d) Trichomonads.

15. Which of the following is the largest of all ?

- | | |
|--------------|------------------|
| a) Pox virus | b) Hepatitis - B |
| c) TMV | d) SV 15. |

16. The graft of transplanting an organ from pig to human is known as

- | | |
|--------------|---------------|
| a) Autograft | b) Isograft |
| c) Xenograft | d) Allograft. |

SECTION - B

Note : i) Answer any *eight* questions.

ii) *Each* question carries *three* marks.

8 × 3 = 24

17. Mention the symptoms of pellagra.

18. What is optometry ?

19. What is meant by Diploid cell strain ?

20. Comment on "L" chain of immunoglobulin.

21. Differentiate active adaptive immunity from passive adaptive immunity.

22. What are superbugs ? Mention any one use of them.

23. What are the uses of transfected cells ?

24. What are Biomedical wastes ? How are they disposed of ?

25. Mention two Biosphere reserves in Tamil Nadu.

26. What are the control and preventive measures of cow-pox diseases ?

27. Mention any two uses of C.T.

28. State Hardy-Weinberg Law.

B

[Turn over

SECTION - C

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

ii) Each question carries 5 marks.

3 × 5 = 15

29. Write down the various types of memory.
30. Enumerate the applications of pathogenic microbes.
31. Write a short note on antibody mediated immunity.
32. Write a short note on Huntington's Chorea.
33. Give an account of different types of species.

SECTION - D

Note : i) Answer any *two* questions.

ii) Each question carries *ten* marks.

2 × 10 = 20

34. Write an essay on Myocardial infarction.
 35. Explain the mechanism of urine formation.
 36. How will you classify cattle based on their purpose ? Give two examples for each. What are the various techniques adopted in cattle breeding ?
 37. "Ozone as a natural sun block" — Discuss and also list out the ways of preventing ozone depletion.
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