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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.

14 × 1 = 14

- Protoxylem lacuna is present in
 - Monocot stem
 - Monocot root
 - Dicot stem
 - Dicot leaf.
- The type of chromosomal aberrations found in Pea is
 - deletion
 - duplication
 - inversion
 - translocation.
- Clover leaf model of tRNA was suggested by
 - Johannsen
 - Waldeyer
 - R. W. Holley
 - Watson.

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4. Restriction enzymes are synthesized by
- a) bacteria only
 - b) yeast
 - c) eukaryotic cells only
 - d) all kinds of cells.
5. Acalyphine is extracted from
- a) *Aegle marmelos*
 - b) *Acalypha indica*
 - c) *Cissus quadrangularis*
 - d) *Mimosa pudica*.
6. The binomial of Teak is
- a) *Thespesia populnea*
 - b) *Tectona grandis*
 - c) *Gossypium barbadense*
 - d) *Pterocarpus santalinus*.
7. Plants having flowers with free petals are found under
- a) Monochlamydeae
 - b) Monocotyledons
 - c) Gamopetalae
 - d) Polypetalae.
8. The number of fertile stamens in *Schizanthus pinnatus* is
- a) one
 - b) two
 - c) three
 - d) four.
9. 'Traveller's palm' refers to
- a) *Musa paradisiaca*
 - b) *Heliconia* sp.
 - c) *Strelitzia reginae*
 - d) *Ravenala madagascariensis*.
10. Bicollateral vascular bundles are seen in the members of
- a) Malvaceae
 - b) Musaceae
 - c) Solanaceae
 - d) Cucurbitaceae.

11. The plant that produces biodegradable plastic is
- a) *Petunia hybrida*
 - b) *Beta vulgaris*
 - c) mouse-eared cress
 - d) *Avena sativa*.
12. An example for primary pigment is
- a) chlorophyll *a*
 - b) chlorophyll *b*
 - c) phycobilins
 - d) xanthophyll.
13. H₂S is oxidised to sulphur by
- a) *Clostridium*
 - b) *Nitrosomonas*
 - c) *Viscum*
 - d) *Beggiatoa*.
14. Glycolysis occurs in
- a) peroxisome
 - b) cytoplasm
 - c) mitochondria
 - d) chloroplast.

SECTION - B

Note : Answer any seven questions.

7 × 3 = 21

15. What is called author citation ? Give an example.
16. Write any three points comparing the androecium of Malvaceae and Solanaceae.
17. Draw and label the parts of open vascular bundle.
18. What are called passage cells ?
19. Draw and label the parts of acrocentric chromosome.
20. What is splicing ?
21. State the conditions under which cyclic photophosphorylation occurs.
22. Define SCP. Give an example.
23. What is Richmond Lang effect ?
24. What is rice bran oil ? Write any two uses of it.

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SECTION - C

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

ii) Draw diagrams wherever necessary. $4 \times 5 = 20$

25. Bring about the significance of herbarium.
26. Write short notes on vessels.
27. Write short notes on structure of chromosome.
28. Briefly mention the basic concept involved in plant tissue culture.
29. Explain the different phases of growth with sigmoid curve.
30. Bring about the physiological effects of auxin.
31. Bring out the economic importance of groundnut.

SECTION - D

Note : i) Answer any two questions.

ii) Draw diagrams wherever necessary. $2 \times 10 = 20$

32. Describe *Datura metel* in botanical terms. Draw floral diagram and write the floral formula.
33. Write anatomical differences between dicot stem and monocot stem.
34. Write an essay on DNA recombinant technology.
35. Write an account on Glycolysis (explanation or flow-chart).

PART - II (ZOOLOGY)

(Marks : 75)

SECTION - A**Note :** i) Answer all questions.

ii) Choose and write the correct answer.

16 × 1 = 16

1. The virus which causes smallpox is
 - a) Paravirus
 - b) Hepatitis B virus
 - c) Variola virus
 - d) Oncogenic virus.
2. Which one of the following is a sexually transmitted disease ?
 - a) Plague
 - b) Typhoid
 - c) Syphilis
 - d) Cholera.
3. MHC genes in mouse are located in
 - a) Chromosome 1
 - b) Chromosome 2
 - c) Chromosome 20
 - d) Chromosome 6.
4. Which one of the following genetic diseases mostly affects boys ?
 - a) Albinism
 - b) Agammaglobulinemia
 - c) Thalassemia
 - d) Huntington's chorea.
5. Which of the following is not an indigenous breed of fowls ?
 - a) Busra
 - b) Chittagong
 - c) Brahma
 - d) Aseel.
6. An example for brackish water fish is
 - a) Tilapia
 - b) Koduva
 - c) Maththi
 - d) Vanjiram.

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7. The WBC diluting fluid is called
- a) Turks solution
 - b) Fehling's solution
 - c) Hayem's solution
 - d) Benedict's solution.
8. The book 'Process of Organic Evolution' was written by
- a) Dobzhansky
 - b) Stebbins
 - c) Wardy-Weinberg
 - d) Hugo de Vries.
9. Which arthritis is characterised by the deposition of sodium urate crystals on the articular cartilage, synovial membrane and in the periarthicular tissues ?
- a) Infective arthritis
 - b) Osteoarthritis
 - c) Rheumatic arthritis
 - d) Metabolic arthritis.
10. The soluble plasma protein fibrinogen is converted to insoluble protein fibrin by
- a) Prothrombin
 - b) Thrombin
 - c) Prothrombinase
 - d) Thrombokinase.
11. The device used to record the electrical activity of the brain is
- a) Electrocardiogram
 - b) Electro-encephalogram
 - c) Echo-cardiogram
 - d) Endoscopy.
12. Urea biosynthesis takes place in
- a) blood
 - b) liver
 - c) cerebrospinal fluid
 - d) kidney.
13. Gingivitis is caused by
- a) *Letshmania donovani*
 - b) *Giardia intestinalis*
 - c) *Trypanosoma gambiens*
 - d) Trichomonads.

14. Which one of the following is not an ozone depleting substance ?

- a) Chlorofluorocarbons b) Nitrogen oxides
c) Methyl bromide d) Hydrogen.

15. Bio-medical wastes are removed by

- a) land filling b) deep-well injection
c) surface impoundments d) incineration.

16. For the transfer of whole nuclei, the cells are treated with to enucleate.

- a) Polyethylene glycol b) Dinitrophenol
c) Cytochalasin B d) Colchicine.

SECTION - B

Note : Answer any *eight* questions.

8 × 3 = 24

17. Classify monosaccharides.
18. Mention the functions of corpus luteum.
19. What is diploid cell strain ?
20. How are macrophages acting as a phagocytic barrier ?
21. Write any three preventive measures of graft rejection.
22. What is pedigree analysis ?
23. What is cDNA ?
24. What is differentiation ?
25. The future source of power is Hydrogen. Why ?
26. What is artificial pacemaker ?
27. What are the characteristic features of Aseel breed of fowl ?
28. State Hardy-Weinberg's law.

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SECTION - C

Note : Answer any *three* questions including Question No. 31 which is compulsory. 3 × 5 = 15

29. Describe the process of absorption and assimilation of digested food.
30. Write the pathogen, symptoms and mode of transmission of Rabies and Cholera.
31. Write a short note on activation of adaptive immunity.
32. Describe the Karyotyping of Human chromosomes.
33. Write the role of genetic drift in evolution.

SECTION - D

Note : Answer any *two* questions. 2 × 10 = 20

34. Describe the origin and conduction of heartbeat and cardiac cycle.
 35. Explain the types of hearing loss and the correcting measures adopted.
 36. Write an essay on non-hazardous solid waste management.
 37. What are the techniques adopted in cattle breeding ? Write a short note on the exotic breeds of cattle.
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