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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. $14 \times 1 = 14$

- The percentage of nucleic acid present in the yeast is
 - 6 - 10%
 - 4 - 6%
 - 4 - 10%
 - 8 - 10%.
- Which of the following is a total parasite ?
 - Cuscuta
 - Viscum
 - Drosera
 - Monotropa.
- Optimum temperature for C_3 pathway is
 - 30°C to 45°C
 - 20°C to 25°C
 - 15°C to 20°C
 - 10°C to 25°C.

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4. Positive geotropism is induced by
- | | |
|--------------------------|-----------------------|
| a) ABA and Auxin | b) Ethylene and Auxin |
| c) Auxin and Gibberellin | d) Ethylene and ABA. |
5. Infracelas includes
- | | |
|-------------|--------------|
| a) 6 orders | b) 4 orders |
| c) 3 orders | d) 5 orders. |
6. Malvaceae is placed in the series
- | | |
|------------------|-----------------|
| a) Thalamiflorae | b) Infracelas |
| c) Heteromerae | d) Disciflorae. |
7. Three stamens are reduced to staminodes in
- | | |
|-----------------------------|--------------------------------|
| a) <i>Solanum nigrum</i> | b) <i>Schizanthus pinnatus</i> |
| c) <i>Datura stramonium</i> | d) <i>Petunia hybrida</i> . |
8. Polyarch xylem is found in
- | | |
|-----------------|------------------|
| a) Monocot leaf | b) Dicot leaf |
| c) Dicot stem | d) Monocot root. |
9. *Acalypha indica* belongs to the family
- | | |
|--------------|------------------|
| a) Malvaceae | b) Euphorbiaceae |
| c) Rutaceae | d) Rubiaceae. |
10. Citrus canker is caused by
- | | |
|--------------------------------|-------------------------------|
| a) <i>Cercospora personata</i> | b) <i>Digitaria marginata</i> |
| c) <i>Xanthomonas citri</i> | d) <i>Acacia nilotica</i> . |
11. Vascular bundles of leaf are
- | | |
|--------------------------|------------------------|
| a) collateral and closed | b) collateral and open |
| c) radial and closed | d) radial and open. |

12. Which biochemical mutant failed to synthesize certain amino acids ?
- a) *Sorghum* b) *Neurospora*
c) *Cicer arietinum* d) *Cicer gigas*.
13. The four main histones present in DNA are
- a) H_2A , H_2B , H_3 and H_4
b) H_1A , H_2B , H_3C and H_4
c) H_2A , H_2B , H_3C and H_4D
d) H_2 , H_5 , H_3 and H_4 .
14. A toxic protein called delta endotoxin is insecticidal and it is produced by
- a) *E. coli* b) *Streptomyces griseus*
c) *Bacillus thuringiensis* d) *Bacillus lactii*.

SECTION - B

Note : Answer any seven questions.

7 × 3 = 21

15. What are the three classes of seeded plants ?
16. Write the botanical names of (a) Tapioca and (b) Castor.
17. Define Eustele.
18. Draw and label Brachysclereid.
19. Draw and label the structure of chromosome.
20. What is inoculation ?
21. What is C_2 cycle ?
22. What are the three stages of sigmoid curve ?
23. What is photolysis of water ?
24. What is Bio-medicine ?

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. Give any 5 importances of Herbarium.
26. Explain different types of meristems based on their positions. Draw diagram.
27. Explain Frederick Griffith experiment in *Diplococcus pneumoniae*.
28. Give an account of SCP.
29. Differentiate between cyclic photophosphorylation and non-cyclic photophosphorylation.
30. Describe Kuhne's fermentation experiment with a diagram.
31. Write any five aims of plant breeding.

SECTION - D

Note : i) Answer any two questions.

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

32. Describe *Datura metel* in technical terms. Draw floral diagram and write the floral formula.
33. Explain vascular tissue system with diagrams.
34. a) What is the role of Bt-toxin in crop protection against pest ?
b) Write any five applications of plant tissue culture.
35. Explain Calvin's Cycle (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 autosomal dominant gene causes

- | | |
|------------------------|-------------------------|
| a) Sickle cell anaemia | b) Thalassemia |
| c) Agammaglobulinemia | d) Huntington's Chorea. |

2. The cloned sheep was produced by

- | | |
|-----------------------|---------------|
| a) Barbara Meclintock | b) Ian Wilmut |
| c) Herbert Bayer | d) R. Briggs. |

3. Cyanides are broken by

- | | |
|-------------------|------------------------------|
| a) Super bug | b) <i>Gibberella usarium</i> |
| c) <i>E. coli</i> | d) Rhizobium bacteria. |

4. Which one of the following is not a greenhouse gas ?

- | | |
|-------------|-------------------|
| a) Methane | b) Carbon dioxide |
| c) Hydrogen | d) Nitrous oxide. |

5. Which is related with Down's syndrome ?

- | | |
|------------|--------------|
| a) Amnesia | b) Alzheimer |
| c) Anaemia | d) Albinism. |

6. Hypoparathyroidism results in

- | | |
|--------------|-------------|
| a) Cretinism | b) Tetany |
| c) Myxedema | d) Ketosis. |

7. The amount of urea excreted in urine in a day is
- a) 40 gm
 - b) 50 gm
 - c) 20 gm
 - d) 25 gm.
8. Calcium ion needed for muscle contraction is released from
- a) blood
 - b) protoplasm
 - c) synovial membrane
 - d) sarcoplasmic reticulum.
9. Which of the following is an exotic species ?
- a) Sindhi
 - b) Haryana
 - c) Ongole
 - d) Ayreshire.
10. Carps with pharyngeal teeth belongs to which order ?
- a) *Siluriformes*
 - b) *Perciformes*
 - c) *Channiformes*
 - d) *Cypriniformes*.
11. Instrument used to count the blood cells after proper dilution is
- a) Manometer
 - b) Haemocytometer
 - c) Sphygmomanometer
 - d) Barometer.
12. The book 'Process of Organic Evolution' was written by
- a) Dobzhansky
 - b) G. L. Stebbins
 - c) Hardy-Weinberg
 - d) Hugo de Vries.
13. Black water fever is due to
- a) *P. vivax*
 - b) *P. malariae*
 - c) *P. ovale*
 - d) *P. falciparum*.

14. The disease caused by *Treponema Pallidum* is
- a) Gonorrhoea b) Syphilis
 c) Pneumonia d) Cholera.
15. The Anti-retroviral drug given for AIDS is
- a) Ampicillin b) Anthromycin
 c) Azidothymidine d) Interferon.
16. Which of the following is an auto-immune disease ?
- a) SCID b) Multiple Sclerosis
 c) Cancer d) Asthma.

SECTION - B

Note : Answer any *eight* questions.

8 × 3 = 24

17. What is Rheumatic arthritis ?
18. Write any three functions of Cerebrospinal fluid.
19. What is proteomics ?
20. What is continuous cell line culture ?
21. What is anaphylaxis ?
22. What is phagocytosis ? Mention the most important phagocytes.
23. Write the symptoms of sickle cell anaemia.
24. Write any three uses of Recombinant DNA technology.
25. What are ozone depleting substances ?
26. What is milk fever ? What are its symptoms ?
27. What is artificial pacemaker ?
28. How does allopatric species differ from sympatric species ?

SECTION - C

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

- 29. Explain the eye defects — short sight and long sight.
- 30. Mention the steps involved in the preparation of bacteriological media.
- 31. What are the symptoms of Allograft rejection ? Write down the measures adopted in clinical field to prevent graft rejection.
- 32. What is database ? What are its types ?
- 33. Describe Sewall-Wright effect.

SECTION - D

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

- 34. Write an essay on Vitamins.
- 35. What is meant by Diabetes mellitus ? Describe its symptoms, types and causes.
- 36. Give an account on importance of biodiversity conservation, consequences of losing biodiversity and strategies that are adopted to conserve biodiversity.
- 37. Describe P, Q, R, S, T waves.