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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 × 1 = 14

1. Stellate parenchyma is present in
  - a) Nymphaea
  - b) Hydrilla
  - c) Canna
  - d) Helianthus.
2. Lignified secondary wall is present in
  - a) Collenchyma
  - b) Aerenchyma
  - c) Parenchyma
  - d) Sclerenchyma.
3. Lamp brush chromosomes were first observed by
  - a) Bridges
  - b) Waldeyer
  - c) Balbiani
  - d) Flemming.

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4. Inherent ability of plant cell to develop into a whole plant is called
- a) Dedifferentiation
  - b) Differentiation
  - c) Redifferentiation
  - d) Totipotency.
5. The 4-carbon compound entering into the bundle sheath cells during Hatch-Slack pathway is
- a) Pyruvic acid
  - b) Glycolic acid
  - c) Oxaloacetic acid
  - d) Malic acid.
6. Antibiotic streptomycin is used to control
- a) Tikka disease of groundnut
  - b) Tungro disease of rice
  - c) Citrus canker of lemon
  - d) Blast disease of rice.
7. Botanical name for pirandai is
- a) *Oryza sativa*
  - b) *Arachis hypogea*
  - c) *Acalypha indica*
  - d) *Cissus quadrangularis*.
8. The pioneer of phylogenetic system is
- a) Gily
  - b) Adolf Engler
  - c) Carolus Linnaeus
  - d) George Bentham.
9. Plants having the flowers with epigynous condition and inferior ovary are placed in the taxon in
- a) Thalamiflorae
  - b) Bicarpellatae
  - c) Inferae
  - d) Unisexuales.
10. Which one of the following members of Solanaceae is having berry fruit ?
- a) *Datura*
  - b) *Petunia*
  - c) *Nicotiana*
  - d) *Lycopersicon*.

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11. Hugo de Vries first observed mutation in
- Sorghum*
  - Oenothera*
  - Neurospora*
  - Cicer Gigas*.
12. The drug manufactured through recombinant DNA that helps the cells to resist viruses is
- Interferon
  - Interleukin
  - Insulin
  - Renin inhibitors.
13. Most effective light for photosynthesis is between the wavelength of
- 400 nm to 700 nm
  - 300 nm to 600 nm
  - 200 nm to 400 nm
  - 500 nm to 800 nm.
14. Energy currency of cell is
- AMP
  - ATP
  - NADH<sub>2</sub>
  - NADPH<sub>2</sub>.

**SECTION - B**

Note : i) Answer any seven questions.

ii) Each question carries three marks.

7 × 3 = 21

15. Write any three merits of Bentham and Hooker's classification.
16. Define tautonym. Give an example.
17. Draw diagram for bicollateral vascular bundle and label the parts.
18. Explain exarch and endarch xylem with examples.
19. Draw diagram for tRNA and label the parts.
20. Write any three monocot transgenic plants.
21. List the photosynthetic pigments.
22. Write the chain of electron carriers in electron transport system.
23. Define fermentation.
24. What is humulin ?

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**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 any five salient features of ICBN.
26. Give an account of classification of meristem with diagram.
27. Explain the special types of chromosomes with diagram.
28. How is DNA cut ?
29. Explain Ganong's respiroscope experiment with diagram.
30. Bring about the physiological effects of cytokinin.
31. Write any five economic importances of cotton.

**SECTION - D**

Note : i) Answer any *two* questions.

ii) Draw diagrams wherever necessary.

iii) Each question carries *ten* marks.

 $2 \times 10 = 20$ 

32. Describe *Musa Paradisiaca* in technical terms. Draw floral diagram and write floral formulae.
33. Describe the four types of cells found in phloem tissues.
34. Explain the basic techniques of plant tissue culture.
35. Draw  $C_4$  cycle without explanation.

## 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 'gastroenteritis' is caused by
  - a) *Salmonella choleraesuis*
  - b) *Entamoeba histolytica*
  - c) *Yersinia pestis*
  - d) *Salmonella typhi*.
2. Cycloguanosine is an
  - a) antiviral antibiotic
  - b) antibacterial antibiotic
  - c) antifungal antibiotic
  - d) antiprotozoan antibiotic.
3. The pathogenic form of *Entamoeba histolytica* is
  - a) encysted spores
  - b) vegetative trophozoite
  - c) merozoite
  - d) schizont.
4. The region of brain which secretes cerebrospinal fluid is
  - a) Vermis
  - b) Flocculus
  - c) Choroid plexus
  - d) Medulla oblongata.
5. A good choice among all the alternative fuel options is
  - a) natural gas
  - b) butane
  - c) hydrogen
  - d) biogas.

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6. Ozone loss was first detected in
- a) Antarctic region
  - b) Equatorial region
  - c) Arctic region
  - d) Siberian region.
7. The record of the electric potential changes that occur in the heart during the cardiac cycle is
- a) Electrocardiogram
  - b) Computed Tomography-CT
  - c) Auto-analyser
  - d) Sphygmomanometer.
8. The book 'Philosophie Zoologique' was written by
- a) Charles Darwin
  - b) Jean Baptiste de Lamarck
  - c) McDougall
  - d) G. J. Mendel.
9. Deficiency of Vitamin D causes
- a) Nyctalopia
  - b) Xerophthalmia
  - c) Osteomalacia
  - d) Pellagra.
10. Which enzyme acts on milk protein ?
- a) Pepsin
  - b) Renin
  - c) Lipase
  - d) Erypsin.
11. A permanent birth control method in male is
- a) Copper-T
  - b) Tubectomy
  - c) Vasectomy
  - d) Contraceptive pills.
12. The immunoglobulin molecules are made up of
- a) Lipoproteins
  - b) Phosphoproteins
  - c) Glycoproteins
  - d) Simple proteins.
13. Which one of the following is an erythroblastic anaemia ?
- a) Hepatomegaly
  - b) Sickle cell anaemia
  - c) Thalassemia
  - d) Albinism.

14. The chromosomes of 19 and 20 represent as
- a) Group C
  - b) Group E
  - c) Group F
  - d) Group G.
15. Chittagong breed of fowls is largely found in
- a) Gujarat
  - b) West Bengal
  - c) Andhra Pradesh
  - d) Tamil Nadu.
16. The tastiest fish among the carps is
- a) *Catla catla*
  - b) *Labeo rohita*
  - c) *Cirrhina mrigala*
  - d) *Channa striatus*.

### SECTION - B

Note : i) Answer any *eight* questions.

ii) Each question carries *three* marks.

$8 \times 3 = 24$

17. Mention the symptoms of 'Marasmus'.
18. What is Hering-Breuer reflex ?
19. Define recombinant DNA.
20. List out the names of any three oncogenic viruses.
21. What is the primary function of the 'Thymus' ?
22. How is the multiple sclerosis formed ?
23. Write the significance of superbugs.
24. Define Bioinformatics.
25. List out the names of any three bio-reserves in India.
26. Mention the important points to be considered during the selection of eggs for hatching.
27. Mention the uses of sphygmomanometer.
28. Define Pangenesis theory.

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**SECTION - C**

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

ii) Each question carries *five* marks.

$3 \times 5 = 15$

29. Enumerate the functions of skin.
30. Describe the structure of HIV virus.
31. Describe the types of grafts.
32. Write the scope of Bio-informatics.
33. Describe Polymorphism.

**SECTION - D**

Note : i) Answer *any two* questions.

ii) Each question carries *ten* marks.

$2 \times 10 = 20$

34. Describe the structure of a skeletal muscle with simple diagram.
  35. Explain how adrenal medulla functions as an endocrine gland.
  36. Write an essay on freshwater management.
  37. Write a detailed account on the preparation of fish pond and its maintenance.
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