

2017

BIOLOGY

(Theory)

Full Marks - 70

Pass Marks - 21

Time : Three Hours and *Fifteen Minutes

(*Fifteen minutes are given as extra time for reading questions)

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

For Question Nos. 1 to 4 select the most appropriate one from the given alternatives A, B, C and D and rewrite the same.

1. The mature female gametophyte in angiosperms is 1
 - A. 7-celled, 7-nucleate
 - B. 7-celled, 8-nucleate
 - C. 8-celled, 7-nucleate
 - D. 8-celled, 8-nucleate.

2. The constant ratio for DNA is 1
 - A. $A+G/T+C$
 - B. $A+T/G+C$
 - C. $A+C/U+G$
 - D. $A+U/C+G$

3. Read the following sentences :

- (i) Ringworm is a fungal disease
- (ii) Malaria is transmitted by a virus
- (iii) *Haemophilus influenza* causes common cold
- (iv) *Wucheria bancrofti* causes filariasis.

The true ones are

- A. (i) and (iii)
- B. (i) and (iv)
- C. (ii) and (iv)
- D. (iii) and (iv)

4. A Genetically Modified Organism (GMO) is

- A. *Bacillus thuringiensis*
- B. *Pseudomonas putida*
- C. *Vibrio cholerae*
- D. *Meloidogyne incognifa*.

Question Nos. 5 to 14 are very short answer type questions carrying 1 mark each.

5. What are linked characters ?

6. What is an Auto-immune disorders ?

7. What is Resource Partitioning ?

8. State one point of difference between a Chasmogamous and a Cleistogamous flower.

9. Australopithecus was more like the modern man than Dryopithecus. Why ?

10. Why is the frequency of occurrence of red-green colour blindness higher in males than in females ?

11. Why does Swiss Cheese have large holes ?

12. Why bio gas plants are more available in rural areas than urban areas ? Give one point.

13. Write *one* point of difference between exonucleases and endonucleases. 1
14. Give *one* reason why lead free petrol or diesel is recommended for automobiles filled with catalytic converters. 1

Question Nos. 15 to 24 are short answer type -II questions carrying 2 marks each.

15. What is Blue Revolution ? What is its contribution to the Society ? 2
16. A bird incubates the eggs of another species of bird. What is this phenomenon called ? Give an example. 2
17. Explain the phenomenon of apomixis. Write *one* advantage of using apomictic seeds. 2
18. How has DNA Finger Printing benefitted the field of Forensic Science ? Give *two* points. 2
19. Elucidate the phenomenon of Homologous organs with *one* example of an organ that is homologous to the hand of man. 2
20. How do bioactive molecules of fungal origin help in restoring good health to humans ? Cite *two* examples. 2
21. Write *two* points of difference between Emigration and Immigration. 2
22. Farmers in India were against the approval for the cultivation of Bt Brinjal by the Government of India. Express your views regarding the issue with justifications. 2
23. Draw a neat diagram of the structure of a sperm and label the following : 2
- (i) Acrosome
 - (ii) Mitochondrial spiral.
 - (iii) Tail.
24. Draw a neat diagram of a Nucleosome and label the following : 2
- (i) Histone Octamer
 - (ii) DNA.

Question Nos. 25 to 31 are short answer type-I questions carrying 3 marks each.

25. What are Baculoviruses ? Write down *two* uses of these viruses as Biocontrol agents. 3

26. What is Gel Electrophoresis ? On what principle does the technique work ? Mention *one* way by which the products obtained through this technique can be utilised. 3
27. What is the El Nino Effect ? What will be the consequences of this phenomenon on the Earth ? Give *two* points. 3
28. Write down *three* points of difference between Embyogenesis and Blastogenesis. 3
29. Why does Drosophila used extensively in the study of Genetics ? Give *three* points. 3
30. Explain the *three* important characteristics of a cloning vector. 3
31. A person suffers from bouts of fever, weight loss and diarrhoea. He takes a blood test and the results show a sharp decline in the number of T-Lymphocytes. What, in your opinion, could be the reason for this and what other tests should be undertaken to identify the underlying disease ? If a disease is detected, what could it be and how could it be treated ? 3

Question Nos. 32 to 34 are essay type questions carrying 5 marks each.

32. What are the post zygotic events in human females that lead to implantation of foetus in the uterus ? Elaborate in *five* points. 5
33. Explain the five factors that affect the Hardy-Weinberg Principle. 5
34. Predict the condition of an Ecosystem if the following events were to occur: 5
- (i) The number of producers decrease drastically
 - (ii) All organisms in one trophic level is completely removed
 - (iii) Top carnivore population is eliminated
 - (iv) Decomposition process ceases to occur
 - (v) CO_2 is absent in the atmosphere.