

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

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

A. $A+G/T+C$

B. $A+T/G+C$

C. $A+C/U+G$

D. $A+U/C+G$

1

3. Read the following sentences : 1
- (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 1
- A. *Bacillus thuringiensis*
 - B. *Pseudomonas putida*
 - C. *Vibrio cholerae*
 - D. *Meloidogyne incognita*.

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

5. What are linked characters ? 1
6. What is an Auto-immune disorders ? 1
7. What is Resource Partitioning ? 1
8. State *one* point of difference between a Chasmogamous and a Cleistogamous flower. 1
9. Australopithecus was more like the modern man than Dryopithecus. Why ? 1
10. Why is the frequency of occurrence of red-green colour blindness higher in males than in females ? 1
11. Why does Swiss Cheese have large holes ? 1
12. Why bio gas plants are more available in rural areas than urban areas ? Give *one* point. 1

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.