

2020

**BIOLOGY**  
(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

*All the questions are compulsory.*

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

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

1. Apomixis is the development of 1
  - A. Seeds with fertilization
  - B. Seeds without fertilization
  - C. Seeds from vegetative cells
  - D. Seeds from reproductive cells
  
2. Which of the following indicates the sign  $\diamond$  in human pedigree analysis ? 1
  - A. Twins
  - B. Second Sibling
  - C. Two unaffected sons
  - D. Two normal offspring

P.T.O.

3. The rate at which light energy is converted into chemical energy of organic molecules in the ecosystem is 1
- A. Net Primary Production
  - B. Net Secondary Production
  - C. Gross Primary Production
  - D. Gross Secondary Production
4. An Urn Shaped Population age Pyramid represents 1
- A. Growing population
  - B. Declining population
  - C. Static population
  - D. Threatened population

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

5. What is scutellum ? 1
6. "Lactational amenorrhea is a natural method of contraception". Comment. 1
7. Mention one cause of frameshift mutation. 1
8. Why is a recessive allele unable to express itself in the heterozygous state? 1
9. State one Programme to improve chances of successful production of hybrids. 1
10. Why does the infection of malarial parasite cause fever in humans? 1
11. Name the technique used for separating DNA fragments in the laboratory. 1
12. Why is the insulin extracted from slaughtered cattle and pigs no more in use by diabetic persons? 1
13. Define trophic level. 1
14. "Amazon rainforest is called lungs of the planet." Comment. 1

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

15. Mention two characteristic features of insect pollinated flowers. 2
16. Distinguish between the blastula and gastrula by giving two points. 2
17. 'STIs' can be prevented by self consciousness. Analyse. 2
18. How is sex determined in honeybee? 2
19. "Man is unable to pass on sex-linked gene to son." Justify the statement. 2
20. Why do farmers prefer biofertilizers to chemical fertilizers these days? Give two points. 2
21. "Now-a-days biofortification is considered as the most practical means to improve health". Analyse by giving two points. 2
22. "Adolescence is the period of high vulnerability to drug abuse". Justify the above statement in two points. 2
23. Why is restriction enzymes called molecular scissors? Support your answer with one example. 2
24. Differentiate between Carbon Cycle and Phosphorus Cycle that operate in nature by giving two points. 2

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

25. How does the study of fossils help to understand organic evolution? Support your answer with examples. 3
26. "Human genome project was called a Mega Project". Justify the statement by giving three points. 3
27. A boy showed symptoms of constipation, abdominal pain, stools with mucous and blood clot. Predict the disease and its pathogen. How does the disease get transmitted? 3
28. Explain the three different steps involved in each cycle of PCR. 3

29. "Biopiracy should be prevented". Analyse the above statement by giving three points. 3
30. How is 'Sixth Extinction' presently in progress different from the previous episodes of mass extinction of species? Give two points to overcome such disaster. 3
31. Draw a neat diagram of antibody molecule and label the following : 3
- (i) Light chain
  - (ii) Heavy chain
  - (iii) Antigen binding site

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

32. State *five* points of difference between Spermatogenesis and Oogenesis. 5
33. "Human ABO blood group is considered a good example of co-dominance and multiple alleles." Analyse the statement by giving suitable reasons. 5

**OR**

"DNA replication is semi conservative". Justify the above statement.

34. How does ozone layer get degraded in the stratosphere ? Why is ozone depletion a threat to mankind ? Explain. 5