

2022

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.

Question Nos. 1 to 4 are of objective type questions carrying 1 mark each. Select the most appropriate one from the given alternatives A, B, C and D and rewrite the same.

1. How can you classify coconut water from tender coconut ? 1
 - (A) Embryo
 - (B) Endosperm
 - (C) Plumule
 - (D) Hypocotyl

2. Mutational result, which result in the addition or deletion of nucleotide bases of DNA, thereby causing gross changes in the amino acid sequences of proteins. Suggest this type of mutations. 1
 - (A) Forward mutations
 - (B) Backward mutations
 - (C) Transversion
 - (D) Frame shift mutations

P.T.O.

3. Suggest a technique to a researcher who needs to separate fragments of DNA. 1
- (A) Microinjection
 (B) Biolistic
 (C) Gel electrophoresis
 (D) Bioreactor
4. Name the ecological pyramid which can never occur in an inverted form. 1
- (A) Pyramid of Energy
 (B) Pyramid of Biomass
 (C) Pyramid of Cytoplasm
 (D) Pyramid of Number

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

5. Indicate the hormone which can influence ovulation. 1
6. A few species of plants produce fruits without fertilization resulting to seedless fruits. Illustrate the inducing procedure. 1
7. Skin colour in human are considered polygenic. Why? 1
8. How Thalassemia is categorized as Mendelian disorder? 1
9. Why meristem culture is used for a virus free plant? 1
10. In a biogas plant, a slurry made by mixing cow dung and water is fed for digestion by microbes. Explain why no inoculum are added to the slurry? 1
11. What is Biopiracy? 1
12. Why palindromic nucleotide sequences are used in rDNA technology? 1
13. How mortality rate of fish and other aquatic creatures increases at the point of sewage discharge? 1
14. Predict the causes of snow-blindness. 1

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

15. Write the two characteristic features of wind pollinating flowers. 2
16. Explain two advantages of Asexual reproduction. 2
17. Differentiate between vasa efferentia and vas deferens. 2
18. A childless couple has agreed for a test tube baby programme. Demonstrate the basic steps involved to conceive the baby. 2
19. Summarize Eukaryotic DNA replication by giving two points. 2
20. How do determination of sexes in birds differ from human ? Give two points. 2
21. State two bioactive molecules with suitable example used in the field of medicine. 2
22. Why is inbreeding necessary ? Give two reasons. 2
23. Illustrate the synthesis of insulin in humans. 2
24. "*Agrobacterium tumefaciens* is a natural genetic engineer of plants". Analyze this statement in two points. 2

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

25. List three salient features of Klinefelter's Syndrome. 3
26. How is DNA regarded as better genetic material than RNA? Explain in three points. 3
27. A person having the problems of "constipation, abdominal pain and cramps, stool with excess mucus and blood clots," Predict the name of this disease, causal organism and mode of transmission. 3
28. "Transgenic animals are being developed for producing useful biological products." Suggest three such biological products. 3
29. Explain three causes of biodiversity loss. 3

30. "Ecologically food webs are more real than a simple food chain". Demonstrate it in three points. 3

31. Draw a diagrammatic view of an anatropus ovule and label micropyle and embryo sac. 3

Question Nos. 32 – 34 are Essay type questions carrying 5 marks each.

32. "Allele frequency in a population are stable and is constant from generation to generation". Predict five factors which affect this statement. 5

OR

"The evolution of life forms has indeed taken place on earth has come from many quarters". Categorize it with five supporting evidences. 5

33. "Bee keeping does not require some specialise knowledge," Illustrate five important points for successful bee keeping. 5

OR

Indicate five preventive measures to control of alcohol and drug abuse among adolescents. 5

34. Write five important characteristics of parasitism. 5

OR

Define population. Write the attributes of a population. 5