

2020
BIOTECHNOLOGY
(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 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. Who for the first time reported the formation of lactic acid from sugar through fermentation ? 1

(A) Nicolas Appert.

(B) Gay Lussac.

(C) Charles Cagniard.

(D) Louis Pasteur

2. Which one of the following chemicals can produce indol acetic acid? 1
- (A) Tryptophan.
(B) Tyrosine.
(C) Glutamic acid.
(D) Histidine.
3. Crossing over in meiosis-I takes place during 1
- (A) diakinesis.
(B) diplotene.
(C) leplotene.
(D) pachytene.
4. Sickle-cell anaemia is still prevalent among some population, because it is 1
- (A) dominant.
(B) recessive.
(C) mutant.
(D) regulated by chromosomes.

For Question Nos. 5 to 14 are short answer type questions carrying 1 marks each.

5. What is nenobiotechnology? 1
6. Define passive defence in plant. 1

7. How will you explain sustainable development ? 1
8. State one point of difference between vitamins and co-enzymes. 1
9. Why phospholipids are considered as important constituents of cell membrane? 1
10. In what way squamous epithelium differs from columnar epithelium? 1
11. How will you define apomixis ? 1
12. Identify the significance of idiogram. 1
13. How translation takes place during protein synthesis ? 1
14. Explain why mitochondria are called as the powerhouse of cell. 1

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

15. What are the functions of topoisomerases and helicases in DNA replication ? 2
16. Illustrate two important contributions of biotechnology in textile industry? 2
17. Identify the storage forms of glucose in plants and animals. 2
18. Illustrate two characteristic features of lipids in the formation of biomembranes. 2
19. Why is the process of meiosis essential for the formation of gametes? Give two reasons. 2
20. State the difference between oligogene and polygenes by giving appropriate examples. 2
21. Mention two important differences between linkage and crossing over. 2

22. Explain with simple example, why enzymes are known as biocatalyst. 2
23. "The length of the lag phase in bacterial growth cycle is apparently dependent on a wide variety of factors". Analyse the statement by giving two points. 2
24. How pedigree analysis help in the verification of genetic disorder in human? 2
- For Question Nos. 25 to 31 are short answer type-I questions carrying 3 marks each.*
- 25 Describe the three phases of Calvin Cycle of carbon dioxide assimilation. 3
- 26 Write the three staining techniques for the visualization of chromosomes. 3
- 27 Why Mendel selected garden pea for his experiment ? Give three points. 3
28. "A nucleotide is made up of three components". Analyse the statement. 3
29. Generalise the three basic microtechniques of IVF. 3
30. "The characters that are controlled by cytoplasmic genes shows certain criteria". Discover the criteria. 3
31. Draw a diagram of a nerve cell and label dendrites and axon. 3
32. Explain five points of differences between DNA and RNA. 5
33. Indicate five important functions of cell membrane. 5
34. Biotechnology can greatly promote human welfare in the 21st century. Comment on the statement by giving five examples. 5