

Total number of printed pages – 7

2 Blo (T) 18/24

2024

## 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 7, select most appropriate one from the given alternatives A, B, C and D and rewrite the same.*

1. Entry of pollen tube through micropyle is called – 1
  - A. Mesogamy
  - B. Pseudogamy
  - C. Chalazogamy
  - D. Porogamy
2. During protein synthesis, peptide bonds are formed at the – 1
  - A. Nucleus
  - B. Nucleolus
  - C. Ribosomes
  - D. Lysosomes

S.O.T. (P.T.O.)

3. Which of the following Nonsense codon is called "ochre"?
- A. AUG
  - B. UAG
  - C. UAA
  - D. UGA
4. Short lived immunity acquired from mother across placenta is categorized as –
- A. Active immunity
  - B. Passive immunity
  - C. Innate non-specific immunity
  - D. Cellular immunity
5. DNA or RNA segment tagged with radioactive molecule is called –
- A. Probe
  - B. Vector
  - C. Clone
  - D. Plasmid
6. Which among the following is the first discovered of Restriction Endonuclease?
- A. Eco RI
  - B. Eco RII
  - C. Hind I
  - D. Hind II



7. Identify from the following ecologists who stated that increased diversity contributed to higher productivity – 1

- A. Paul Ehrlich
- B. David Tilman
- C. Robert May
- D. Georgy Gause

**Question Nos.8 to 17 are very short type questions carrying 1 mark each.**

8. Name one disorder that can be detected by amniocentesis. 1
9. Distinguish between true fruits and false fruits by giving one point. 1
10. State the utility of back cross. 1
11. Why is Y chromosome referred to as genetically inert? 1
12. Law of dominance is not universally applicable. Give reason. 1
13. Why is mortality of animals increase at sewage discharge points? 1
14. Why is colostrum very much essential for new born infants? 1
15. Virus infected cells provide innate immunity to other uninfected cells. Analyse. 1
16. During gel electrophoresis DNA fragments move towards the anode instead of the cathode. Give reason. 1



17. What is 'The Evil Quartet' in biodiversity losses? 1

*Question Nos. 18 to 27 are short answer type-II questions carrying 2 marks each.*

18. Name the parts of an angiosperm flower in which the development of male and female gametophyte takes place. 2

19. Differentiate between tubectomy and vasectomy by giving two points. 2

20. "Flowering plants have developed many devices to prevent self-pollination". Analyse with suitable reasons. 2

21. How does the study of comparative anatomy provide evidence in favour of evolution? Support your answer with two points. 2

22. Explain by giving two points the role of Integrated pest Management programme. 2

23. How does spleen act as lymphoid organ? Give two points. 2

24. Differentiate between sticky end and blunt end of DNA in two points. 2

25. Human insulin when initially synthesized in human body needs to be processed before it can act. Explain. 2

26. Why do we conserve wildlife? Give two points. 2

27. "There are certain limitations of ecological pyramids". Give reason. 2

**Question Nos. 28 to 33 are short answer type-I questions carrying 3 marks each.**

28. Explain aminoacylation of the tRNA. 3

**OR**

Why is RNA considered as the first genetic material? Explain. 3

29. A DNA segment has a total of 1000 nucleotides, out of which 240 of them are adenine containing nucleotides. How many pyrimidine bases this DNA segment possesses ? 3

**OR**

If the gene frequency of a recessive allele  $t$  is 0.2, find out the percentage of individuals with genotype  $TT$ ,  $Tt$  and  $tt$  in the population. 3

30. Differentiate between Benign tumour and Malignant tumour by giving three points. 3

**OR**

Elucidate the process of replication of a retrovirus after it gains entry into human body. 3

31. "Prevention is better than cure". Justify with regard to drug abuse among youth in three points. 3

**OR**



"Determination of BOD can help in suggesting the quality of water body". Justify.

3

32. Although biotechnology promotes human welfare, it can also be misused to increase human suffering. Comment on the statement by giving three points. 3

**OR**

Genetically Modified plants have been useful in many ways. Give suitable reasons.

3

33. Draw a neat diagram of declining age pyramid and label the pre-reproductive and reproductive age group. 3

**OR**

Draw a neat diagram of inverted pyramid of biomass of aquatic ecosystem and label primary producer and secondary consumer. 3

*Question Nos. 34 to 36 are Essay type questions carrying 5 marks each.*

34. Enumerate five adaptive floral characteristics of insect pollinated flowers. 5

**OR**

Trace the various phases of menstrual cycle emphasizing the role of hormones in human female. 5

35. Demonstrate in five points the goals of Human Genome project. 5

*OR*

“DNA polymorphism is the basis of DNA fingerprinting technique”. Analyse.

5

36. Why is India considered as a mega biodiversity hotspot? Explain the biodiversity hotspots of India with their location. 5

*OR*

Explain with illustrations the different population interactions and give examples.

5