

2025 II 27

0930

Seat No.

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Time : 3 Hours

BIOLOGY

Subject Code

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Total No. of Questions : 34 (Printed Pages : 7)

Maximum Marks : 70

- INSTRUCTIONS :**
- (i) All questions are compulsory.
 - (ii) Draw diagram in lead pencil only.
 - (iii) The question paper consists of four Sections, A, B, C and D.
 - Section A has **13** questions of **1** mark each.
 - Section B has **12** questions of **2** marks each.
 - Section C has **6** questions of **3** marks each.
 - Section D has **3** questions of **5** marks each.
 - (iv) The total number of questions is **34**.
 - (v) There is no overall choice, however an internal choice is provided in two questions of Section B, one question of Section C and two questions of Section D.
 - (vi) Multiple choice questions should be attempted only once, if attempted more than once it will not be evaluated. Choose the correct option and rewrite on the answer-sheet.

Section-A (1 Mark Each)

1. Acrosomal reaction of the sperm occurs due to :
 - its contact with zona pellucida of the ova
 - reactions within the uterine environment of the female
 - reactions within the epididymal environment of the male
 - androgens produced in the uterus

2. Choose the type of pollination in which attractants and rewards are required :
 - Hydrophily
 - Anemophily
 - Cleistogamy
 - Entomophily

3. Which biotechnological application is used to produce large quantities of insulin for medicinal purpose ?
 - DNA fingerprinting
 - Gene therapy
 - Polymerase Chain Reaction
 - Recombinant DNA technology

4. Why do species of bacteria and humans have their DNA analyzed using the same fundamental methods ?

- Every cell in every creature is identical
- Every organism has the same quantity of DNA
- All creatures have the same DNA sequence
- All organisms have the same basic DNA structure

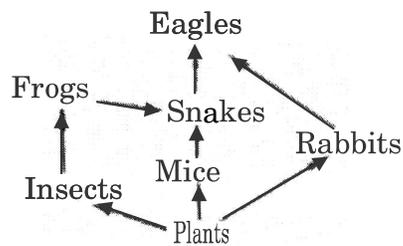
5. The term used to describe the species whose number of individuals is greatly reduced to a critical level.

- Indeterminate
- Rare
- Vulnerable
- Endangered

6. Which of the following claims would be accurate if garden pea plants from Mendel's Garden were sampled ?

- Round seeds were more prevalent than wrinkled seeds
- Wrinkled seeds were more prevalent than round seeds
- Both round and wrinkled seeds were equally prevalent
- The response depended on the time of day the sample was taken

7. The most effective way to decrease the population of a country is :
- to educate people
 - to have better houses and infrastructure
 - to eradicate poverty
 - to practice and implement family planning
8. From among the causal organisms for ringworm select the odd one out :
- Microsporum
 - Trichophyton
 - Epidermophyton
 - Macrosporum
9. Sketch a neat diagram of a typical anatropous ovule.
10. What would happen if sperms are devoid of their tail ?
11. Give an example for each, an alcoholic drink produced by distillation and without distillation.
12. A food web is represented in the diagram below.



Which population in this food web would most likely benefit from an increase in the mice population ?

13. 'India represents more than 1000 varieties of mangoes biodiversity' Mention the level of biodiversity shown by mangoes.

Section-B (2 Marks Each)

14. Explain how seeds offer more advantages to angiospermic plants.
15. Briefly describe the role of hormones in the regulation of oogenesis.

Or

Briefly describe the role of hormones in the regulation of spermatogenesis.

16. Sketch a neat diagram of L.S. of a flower.
17. Describe the Hershey and Chase experiment confirming that the genetic material is DNA.
18. Draw a neat diagram showing sectional view of the female reproductive system.
19. State and elaborate on any *two* factors affecting allelic frequencies in a population.
20. Explain the sequence of events that follow when a retrovirus infects humans.
21. Draw a neat diagram of Watson-Crick model for semiconservative DNA Replication.
22. Illustrate with the help of a suitable example the naming of a restriction endonuclease.

23. Mr. Bean went on an excursion trip with his friends to Ladakh. On reaching the destination, he suddenly experienced heart palpitations, nausea and fatigue. One of his friends suggested him to rest for some time.
- (i) Suggest the reasons for the sudden deterioration of health
 - (ii) Why did Mr. Bean's friend ask him to rest ?
24. Compare the features of the genetic code : Unambiguous and universal.

Or

Compare the features of the genetic code : Degenerate and initiator.

25. Give in detail any *two* causes of Biodiversity losses.

Section-C (3 Marks Each)

26. Suggest any *three* methods to assist infertile couples to have children.
27. Name the type of interaction seen in each of the following examples :
- (i) *Ascaris* living in the intestine of humans
 - (ii) Wasp pollinating fig plants
 - (iii) Clown fish living among the tentacles of sea anemone.

Or

Name the type of interaction seen in each of the following examples :

- (i) Mycorrhizae living in the roots of higher plants.
- (ii) Orchid growing on a branch of a mango tree.
- (iii) Disappearance of *Chathamalus* when *Balanus* dominated the rocky sea coast of Scotland.

28. Write a comparative note on the characteristics of *Homo habilis*, *Homo erectus* and *Homo sapiens*.
29. How do you think modern agricultural practices in India are being benefited from genetically modified plants ?
30. Identify and state the various factors that regulate the process of decomposition.
31. Baculoviruses and *Bacillus thuringiensis* are the pathogens that attack plants and are also used as biocontrol agents. Justify.

Section-D (5 Marks Each)

32. Give a detailed account of the Chromosomal disorders in humans.

Or

Give a detailed account of any *two* Mendelian disorders in humans.

33. Define innate immunity and describe various types of barriers.

Or

Define acquired immunity and describe its types. Add a note on the structure of an antibody molecule.

34. Explain the features : cloning sites and vectors for cloning gene in plants and animals that are required to facilitate cloning into a vector.