

BHARATIYA VIDYA BHAVANS V.M. PUBLIC SCHOOL
SAMPLE PAPER-4
SUBJECT –BIOLOGY

The following instructions are to be read carefully

1. All questions are compulsory.
2. The question paper consists of 26 questions. Question no.1-5 is of 1 mark each, question no.6-10 is of 2 marks each, question no.11-22 is of 3 marks each, question no. 23 is of 4 marks and question no.24-26 is of 5 marks each.
3. There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks, and all the three questions of 5 marks. A student has to attempt only one of the alternatives in such questions.

Section A

1. Define in –breeding depression.
2. Name the organism commercially used for the production of single celled protein.
3. What is a gene gun?
4. What is a bioreactor?
5. State the role of transposons in silencing of mRNA in eukaryotic cells?
6. Differentiate between albuminous and non-albuminous seeds, giving one example of each.
7. In haploid organisms that undergo sexual reproduction, name the stage in the life cycle when meiosis occurs. Give reasons for your answers.
8. What is mutational breeding? What are its limitations?
9. Define analogous organs. Give one example of an organ analogous to human fore limb.
10. Draw a neat labelled diagram of a nucleosome.

OR

What are the characteristic features of a true-breeding line?

11. Explain “river popper” hypothesis. Name the ecologist who proposed it
12. What is cryopreservation? Give its one use.
13. Explain the carbon cycle with the help of simplified model.
14. Draw neat and a labeled diagram of PCR
15. Why DNA cannot pass through the cell membrane? Explain how is a bacterial cell made competent to take up recombinant DNA from the medium?
16. With the help of diagrammatic representation only, show the steps of recombinant DNA Technology
17. Fitness is the end result of the ability to adapt and get selected by nature. Explain with suitable example
18. How is activated sludge produced during sewage treatment?

OR

Explain how the activated sludge is used in biogas production.

19. a) Why are the fruit juices bought from market clearer as compared to those made at home?
- b) Name the bioactive molecules produced by *Trichoderma polysporum* and *Monascus purpureus*.

20. .Mention three functions of LAB that are useful to man.

21. a) Why is the enzyme cellulase needed for isolating genetic material from plant cell and not from animal cells?

b) For producing a recombinant protein in large scale, which vector would you choose --a low copy number or a high copy number? And why

22. Give an account of energy flow in an ecosystem.

23. Your school has been selected by the Department of Education to organise and host an interschool seminar on “Reproductive Health ---Problems and Practices’. However, many parents are reluctant to permit their wards to attend it. Their arguments are that the topic is “too embarrassing”.

Put forth four arguments with appropriate reasons and explanation to justify the topic to be very essential and timely.

24. a)How does microspore mother cell develop into mature pollen grain in angiosperm?

b)Describe the structure of a mature pollen grain and draw a labeled diagram of its two-celled stage.

OR

a) Explain the changes the primary oocyte undergoes while in different follicular stages before ovulation.

b) Give the schematic representation of spermatogenesis in human

25. a) Would you consider the wings of a butterfly and a bat as homologous or analogous? Why?

b) Evolution is not a direct process, but a stochastic process, based on chance events in nature. Justify.

OR

a) What are hallucinogens? Give their two examples. Mention their clinical use, if any.

b) Differentiate between the following and give examples of each: innate and acquired immunity.

26. Distinguish between

a) Grazing food chain and detritus food chain

b) Production and decomposition

c) Food chain and food web

OR

a) What is EL Nino effect ? Explain how it accounts for biodiversity loss.

b) Explain any three measures that you as an individual would take to reduce environmental pollution