# Pre Board 1 Examination, 2019-20
# Biology
# Class – 12

Max. Marks: 70

Date: 12 January, 2020 Time Allowed: 3 hours

General Instructions:

1. There are a total of 27 questions and five sections in the question paper. All questions are compulsory.
2. Section A contains questions number 1 to 5, multiple-choice questions of 1 mark each.
   Section B contains questions number 6 to 12, short answer type I questions of 2 marks each.
   Section C contains question numbers 13 to 21, short answer type II questions of 3 marks each.
   Section D contains questions number 22 to 24, case based short answer type questions of three marks each.
   Section E contains question numbers 25 to 27, long answer type questions of five marks each.
3. There is no overall choice in the question paper. However, an internal choice is provided in two questions of 1 mark, one question of 2 marks, two questions of 3 marks and all the three questions of 5 marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.
4. Wherever necessary, the diagram drawn should be neat and properly labelled.

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1. Bacteria protect themselves from viruses by fragmenting viral DNA upon entry with (1)

   a. Exonucleases b. Endonucleases c. Taq Polymerases d. Gyrase

2. In Xerophytic plants, leaves have (1)

   I. Leathery surface
   II. Large surface area
   III. Waxy cuticle
   IV. Sunken stomata on upper epidermis

   a. I, II and IV b. II and III c. I, III and IV d. I and IV

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| | 3. | Which of the following sets represents the egg apparatus in angiosperms?<br>a. Ovum and antipodals b. Ovum and Synergids c. Ovum, Synergids and polar nuclei d. Ovum, Antipodals and Synergids.<br>**OR**<br>Which one of the following events is correctly matched with the time period in a normal menstrual cycle?<br>a. Release of egg: $5^{th}$ day<br>b. Endometrium regenerates: 5-10 days<br>c. Endometrium secretes nutrients for implantation 11-18 days.<br>d. Rise in progesterone level: 1-15 days | (1) |
| | 4. | Anil is colour-blind. What is the chance of his son inheriting colour-blindness from him?<br>a. 0% b. 50% c. 100% d. 75% | (1) |
| | 5 | Malignant tertian Malaria is caused by<br>a. Plasmodium malariae<br>b. Plasmodium ovale<br>c. Plasmodium vivax<br>d. Plasmodium falciparum<br>**OR**<br>Which of the following groups contains biofertilisers?<br>a. Nostoc, Anabaena, Phytophthora<br>b. Azotobacter, Nostoc, Groundnut<br>c. Azolla, Azospirillum, Ulothrix<br>d. Anabaena, Azotobacter, Azospirillium | (1) |
| | | SECTION B | |
| | | Question numbers **6** to **12** carry two marks each. | |

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| | 6. | What are the two core technologies that enabled the birth of modern biotechnology?<br><br>**OR**<br><br>What is meant by continuous culture system? What is its advantage? | (2) |
| | 7. | Demand for mushroom as food has led to its culturing on a large scale. Similarly, it is perceived that microbes too would become acceptable as food. Identify a microbe, which can be cultured as a food source and give the applicability of its culture in the given context. | (2) |
| | 8. | a. Patients who have undergone myocardial infarction are given clot buster. Mention the clot buster administered and its microbial source.<br><br>b. A person recuperating from illness is advised to have curd regularly. Why? | (2) |
| | 9. | Fill in the spaces a, b, c and d in the following table of contraceptive devices and the methods of contraception. | (2) |
| | 10. | It is a common sight in villages where cattle egrets and the grazing cattle are found in close association. What kind of interaction do they show? Explain. Give an example of such an interaction from plants.<br><br>**OR**<br><br>A farmer maintained beehives in his Brassica field during its flowering season. How will he be benefited? | (2) |
| | 11. | State the Mendelian principle which can be derived from a dihybrid cross and not from monohybrid cross. | (2) |
| | 12. | Comment upon the mode of pollination in Vallisneria and Eichhornia, which have emergent flowers. | (2) |

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| Multiload 375 | A |
| B | Non – medicated IUD |
| C | Barrier (method) used by females |
| Progestasert | D |

## SECTION-C

Question numbers **13** to **21** carry three marks each:

13. (a) In pBR322, foreign DNA has to be introduced in $tet^R$ region. From the restriction enzymes given below, which one should be used and why: (3)

PvuI, EcoRI, BamHI

(b) Give reasons, why the other two enzymes cannot be used.

14. a. Differentiate between the first trophic level of a DFC and GFC. (3)

b. Mention the two aspects of primary productivity.

**OR**

Explain the different steps involved in the secondary treatment of sewage.

15. a. How are normal cells transformed into cancerous cells? (3)

b. Mention the difference between the viral oncogenes and cellular oncogenes

16. Read the following base sequence of a certain DNA strand and answer the questions that follow: (3)

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|---|---|---|---|---|---|---|---|---|---|
| A | A | G | A | A | T | T | C | A | A |
| T | T | C | T | T | A | A | G | T | T |

a. What is called a palindrome sequence of DNA?
b. Write the palindrome nucleotide sequence shown in the DNA strand given and mention the enzyme that will recognize such a sequence.
c. State the significance of enzymes that identify palindrome nucleotide sequences.

17. Bring out the difference between alpha-thalassemia and beta- thalassemia. [3]

Describe any three methods of vector less transfer of rDNA into host cells.

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| | 18. | **OR**<br><br>a. How does catalytic converter function in an automobile?<br>b. The entire fleet of public transport in Delhi switched over to new fuel.<br>i. Write the full name of the fuel.<br>ii. Why it is preferred to the other conventional fuels? | [3] |
| | 19. | A person is born with a hereditary disease; suggest the possible corrective method for it. Illustrate by giving a specific example.<br><br>**OR**<br><br>A 17-year-old boy is suffering from high fever with profuse sweating and chills. Choose the correct option from the following diseases, which explains these symptoms, and rule out the rest with adequate reasons.<br><br>A. Typhoid<br>B. Viral fever<br>C. Malaria | [3] |
| | 20. | Cow dung and water is mixed and the slurry is fed into the biogas plant for digestion by microbes. The person performing the process shares that there is no need to provide inoculum for it, why? What is the role of microbes at the source? Under which condition will they be most active and effective? | [3] |
| | 21. | Identify a, b, c, d, e and f in the following table: | [3] |

| Organism | Bioactive molecule | Use |
|---|---|---|
| Monascus purpureus | A | B |
| C | D | Antibiotic |
| E | Cyclosporin A | F |

SECTION – D

22. [3]

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| | 23. | a. What modification is done on the Ti plasmid of Agrobacterium tumefaciens to convert it into a cloning vector?<br>b. Why are those restriction enzymes, which cut the DNA strands a little away from the centre of the recognition site, more useful in construction of recombinant DNA?<br><br>a. Ecological succession is faster in a fire-devastated forest than on a bare rock. Justify the statement.<br>b. How do the pioneer species on a bare rock pave way to the next stage? | [3] |
| | 24. | a. A male honeybee (drone) has no father, but has a grandfather. Justify the statement.<br>b. State the law of Mendel, which is universally acceptable without any exception. | [3] |
| | | SECTION E | |
| | 25. | a. What are the advantages of breeding for disease-resistance in plants?<br>b. How are evaluation and testing of a new crop variety carried out?<br>**OR**<br>a. Why should biological control of pests and pathogens be preferred to the conventional use of chemical pesticides?<br>b. Explain how the following microbes act as biocontrol agents?<br>i. Bacillus thuringiensis<br>ii. Nucleopolyhedrovirus | [5] |
| | 26. | Citing lake as an example of a simple aquatic ecosystem, interpret how various functions of this ecosystem are carried out. Make a food chain that is functional in this ecosystem.<br>**OR**<br>a. Colonization of a rocky terrain is a natural process. Mention the group of organisms, which invade this area first. Give an example.<br>b. Over the years, it has been observed that some of the lakes are disappearing due to urbanization. In absence of human interference, depict by making a flow-chart, how do the successional series progress from hydric to mesic condition.<br>c. Identify the climax community of hydrarch and xerarch succession. | [5] |
| | | a. Write the three hypotheses for explaining why tropics show greater levels of species richness or biodiversity.<br>b. What are Ramsar sites? What is meant by 'wise use' of Ramsar philosophy? | [5] |

27.

**OR**

A segment of DNA, GCC AGG GGG ATG was translated into an oligopeptide arginine – serine – proline - tyrosine

i. Write the codons for these four amino acids.
ii. If the first adenine in the DNA segment is substituted by guanine.
    a. What will be the mRNA transcribed by it?
    b. What will be the sequence of amino acids in the new oligopeptide?
    c. Write the anticodons for these amino acids.

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| | 25. | | |
| | 26. | | [5] |
| | | | [5] |
| | 27. | a) Draw a labelled longitudinal sectional view of an albuminous ‘seed’.<br>b) How are seeds advantageous to flowering plants?<br>c) Name the process involved in the production of nematode resistant tobacco plants, using genetic engineering. Explain the strategy adopted to develop such plants.<br>OR | |

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| | | Describe the various stages involved in gene transfer for the commercial production of human insulin by Eli Lily. | |
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