Punjab Board Class 12 Biology 054 C Question Paper

Time Allowed :3 Hours	Maximum Marks :70	Total Questions :19

General Instructions

1. **You must write the subject-code/paper-code 054 in the box provided on the title page of your answer-book.**
2. **Make sure that the answer-book contains 32 pages (including title page) and are properly serialled as soon as you recieve it.**
3. **Question/s attempted after leaving blank page/s in the answer-book would not be evaluated.**
4. **This question paper consists of four parts-A,B,C, and D with a total of 19 questions.**
5. **Part - A includes Question 1, which has 20 sub parts, each worth 1 mark. It includes 12 Multiple choice questions, 4 fill-in-the-blanks questions and 4 true/false questions.**
6. **Part - B includes questions 2 to 11, totalling 10 short-answer questions, each worth 2 marks.**
   Questions 3,6,7 and 11 have an internal choice.
7. **Part - C includes questions 12 to 16, totalling 5 questions, each worth 3 marks. Questions 13 and 16 have an internal choice,**
8. **Part - D includes question 17 to 19, totalling 3 questions, each worth 5 marks. All questions in this section have 100% internal choice.**
9. **Punjabi and Hindi versions of questions are true translation of English version. So in the case of any confusion, consider English version to be correct.**

1(i). During the life cycle of Plasmodium, sexual reproduction takes place in :

(A) Human
(B) Female Anopheles mosquito
(C) Male Anopheles mosquito
(D) Both (a) and (b)

(ii). Vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is :

(A) Vitamin C
(B) Vitamin B_{12}
(C) Vitamin D
(D) Vitamin E

(iii). The letter R in EcoRI is derived from the :

(A) Name of genus
(B) Name of strain
(C) Name of species
(D) Term 'restriction'

(iv). During the processing of proinsulin into mature insulin :

(A) C peptide is added to proinsulin
(B) C peptide is removed from proinsulin
(C) B peptide is added to proinsulin
(D) B peptide is removed from proinsulin

(v). If an organism's body pattern resembles its environment, making it difficult to spot, it is called :

(A) Camouflage
(B) Mimicry
(C) Warning Colouration
(D) Both (a) and (b)

(vi). The Red Data Book deals with :

(A) Endangered and extinct organisms
(B) Endemic plants
(C) Domestic animals
(D) All of these

(vii). A farmer noticed that his apple trees were not bearing as much fruits as expected, despite having plenty of flowers. He observed that the bee population in his orchard had decreased significantly this season due to recent pesticide usage. Which type of pollination is likely being affected in this case, and what could be a possible solution?

(A) Wind pollination - Reducing pesticide use will allow wind to effectively pollinate the flowers.
(B) Water pollination - Increasing irrigation will help water carry pollen between flowers.
(C) Insect pollination - Reducing pesticide use and introducing bee hives could improve fruit production.
(D) None of the above.

(viii). In a 28-days human ovarian cycle, when does ovulation typically take place?

(A) Day 1 of the cycle
(B) Day 5 of the cycle
(C) Day 14 of the cycle
(D) Day 28 of the cycle

(ix). X and Y are two birth control methods, commonly called sterilization methods. X and Y are generally advised for the male and female partner respectively to prevent pregnancies. These techniques are highly effective. Identify X and Y.

(A) Tubectomy and Vasectomy
(B) Vasectomy and Tubectomy
(C) IUDs and Vaults
(D) Diaphragm and spermicide

(x). A woman with blood group 'AB' marries a man with blood group "O". Which of the following statements is true about the possibilities of inheritance of the blood groups?

(A) They produce children with blood group 'O' only.
(B) They produce children with blood group 'AB' only.
(C) They produce children some with blood group 'AB' and some with blood group 'O'.
(D) They produce children some with blood group 'A' and some with blood group 'B'.

(xi). The process of copying genetic information from one strand of DNA into RNA is termed as :

(A) Replication
(B) Transcription
(C) Translation
(D) Reverse transcription

(xii). The following are some of the well-known fossils in the evolution of modern man :
• Homo habilis
• Homo erectus
• Homo sapiens
• Australopithecus
The correct sequence of their origin is :

(A) Homo habilis - Homo erectus - Homo sapiens - Australopithecus
(B) Australopithecus - Homo habilis - Homo erectus - Homo sapiens
(C) Homo habilis - Australopithecus - Homo erectus - Homo sapiens
(D) Australopithecus - Homo erectus - Homo habilis - Homo sapiens

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(xiii). The pyramid of _____ is always upright and can never be inverted.

(xiv). The structure that provides vascular connection between the foetus and uterus is called _____.

(xv). Lactational amenorrhea and coitus interruptus are _____ methods of birth control.

(xvi). The ability of malignant tumors to spread to distant sites in the body through the blood is called _____.

(xvii). The introduction of alien species usually enhances biodiversity by adding stability to native ecosystems.

(xviii). Antibiotics are chemical substances produced by some microbes that can kill or inhibit disease-causing microbes.

(xix). Thymus increases in size with age and reaches its maximum size during puberty.

(xx). Simple shake flasks are more effective than stirred-tank bioreactors for producing large quantities of recombinant proteins.

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2. Expand GEAC. What is the responsibility of GEAC, set up by the Indian Government.

3(a). Write any two points of difference between grazing food-chain and detritus food-chain.

3(b). What do you mean by 'Rivet Popper' hypothesis ?

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4. What is meant by emasculation ? How is it useful in plant breeding programme ?

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5. Draw labelled diagram for the structure of human sperm.

6(a). Amniocentesis for sex determination is banned in our country. Is this ban necessary ? Comment.

6(b). Briefly describe Zygote Intra Fallopian Transfer (ZIFT) technique practice to help infertile couples.

7(a). Name the chromosomal disorder that is caused by the trisomy of the 21^{st} chromosome. Also write down its symptoms.

7(b). What is incomplete dominance ? Give an example.

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8. Are the thorn of Bougainvillea and tendril of Cucurbita homologous or analogous ? What type of evolution has brought such a similarity in them ?

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9. Draw a labelled diagram showing the structure of an antibody molecule.

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10. How do methanogens help in producing biogas ?

11(a). DNA being hydrophilic cannot pass through the cell membrane of a host cell. Explain how the host cell is made 'competent' to take up the recombinant DNA ?

11(b). Why is it essential to have 'selectable marker' in a cloning vector ?

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12. Explain Gause's competitive exclusion principle.

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13. How did Hershey and Chase differentiate between DNA and protein in their experiment while proving that DNA is the genetic material ?

13(OR). Discuss the nature of genetic code.

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14. Darwin observed a variety of beaks in small black birds inhabiting Galapagos Islands. Explain what conclusions did he draw and how ?

15(a). Identify the plant shown in the diagram.

15(b). Name the drug obtained from the latex of this plant.

15(c). How does the drug affect the human body ?

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16. A recombinant DNA is formed when sticky ends of vector DNA and foreign DNA Join. Explain how the sticky ends are formed and get jointed.

16(OR). What are Cry proteins ? How have biotechnologists exploited these proteins to benefit farmers ?

17(I). What does this diagram represent ?

17(II). Which part is responsible for guiding the pollen tube into synergid ?

17(III). What will be the fate of polar nuclei after fertilisation ?

17(IV). Which of the following structures is/are present at micropylar end ?

(a) Antipodals
(b) Synergids
(c) Egg
(d) Both (b) and (c)

17(V). Which of the following structures participate in double fertilisation ?

(a) Polar Nuclei
(b) Antipodals
(c) Egg
(d) Both (a) and (c)

17(OR). What is Oogenesis. Briefly describe the process of Oogenesis.

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18. State and explain Mendel's Law of Independent Assortment with reference to a dihybrid cross involving pea plant. Consider the traits of seed shape (round vs. wrinkled) and seed colour (yellow vs. green).

18(OR)(a). What is the function of the substance labelled A in this diagram of the Lac operon?

18(OR)(b). Label parts B to D in the Lac operon diagram.

18(OR)(c). What would happen if the substance labelled A was not present?

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19. Read the passage carefully and answer the given questions.

Comprehension Passage:
A pond is a shallow water body in which all the basic components of an ecosystem are well exhibited.
The abiotic component is the water with all the dissolved inorganic and organic substances and the rich soil deposit at the bottom of the pond.
The solar input, the cycle of temperature, day-length and other climatic conditions regulate the rate of function of the entire pond.
The autotrophic components include the phytoplankton, some algae and the floating, submerged and marginal plants found at the edges.
The consumers are represented by the zooplankton, the free swimming and bottom dwelling forms.
The decomposers are the fungi, bacteria and flagellates especially abundant in the bottom of the pond.
This system performs all the functions of any ecosystem and of the biosphere as

a whole, i.e., conversion of inorganic into organic material with the help of the radiant energy of the sun by the autotrophs, consumption of the autotrophs by heterotrophs, decomposition and mineralisation of the dead matter to release them back for reuse by the autotrophs.
These events are repeated over and over again.
There is unidirectional movement of energy towards the higher trophic levels and its dissipation and loss as heat to the environment.

19(a). Name the abiotic and autotrophic components of a pond.

(A) Abiotic: Water and soil; Autotrophic: Phytoplankton and plants
(B) Abiotic: Zooplankton; Autotrophic: Bacteria
(C) Abiotic: Fungi; Autotrophic: Animals
(D) Abiotic: Consumers; Autotrophic: Decomposers
(E) Abiotic: Flagellates; Autotrophic: Zooplankton

19(b). Name the decomposers present in a pond.

(A) Fungi, bacteria and flagellates
(B) Fish and frogs
(C) Phytoplankton
(D) Zooplankton
(E) Aquatic plants

19(c). What climatic factors influence the functioning of a pond ecosystem ?

(A) Temperature, day-length and solar input
(B) Soil fertility only
(C) Wind velocity only
(D) Salinity only
(E) Rainfall only

19(d). How does energy flow in a pond ecosystem ?

(A) Cyclic flow of energy
(B) Unidirectional flow from producers to higher trophic levels
(C) Energy flows from decomposers to producers
(D) Energy remains constant at all levels
(E) Energy flows only between consumers
