

**CBSE EXAMINATION PAPER—2019 (DELHI)**  
**BIOLOGY**

*Time : 3 hrs.*

*Max. Marks : 80*

**GENERAL INSTRUCTIONS:**

- (i) *There are total 27 questions and four sections in the question paper. All questions are compulsory.*
- (ii) *Section A contains question numbers 1 to 5, very short answer type questions of one mark each.*
- (iii) *Section B contains question numbers 6 to 12, short answer type-I questions of two marks each.*
- (iv) *Section C contains question numbers 13 to 24, short answer type-II questions of three marks each.*
- (v) *Section D contains question numbers 25 to 27, long answer type questions of five marks each.*
- (vi) *There is no overall choice in the questions paper, however, an internal choice is provided in two questions of one mark, two questions of two marks, four questions of three marks and all the three questions of five marks. In these questions, an examinee is to attempt any one of the two given alternatives.*
- (vii) *Wherever necessary, the diagram drawn should be neat and properly labelled.*

**Set-I**

**SECTION A**

1. British geneticist R.C. Punnett developed a graphical representation of a genetic cross called "Punnett Square". Mention the possible result this representation predicts of the genetic cross carried. (1)
2. State the two principal outcomes of the experiments conducted by Louis Pasteur on origin of life. (1)
3. Name the layer of the atmosphere that is associated with 'good ozone'. (1)

**OR**

Mention the term used to describe a population interaction between an orchid growing on a forest tree.

4. What are 'flocs', formed during secondary treatment of sewage? (1)

**OR**

Write any two places where methanogens can be found.

5. At what stage does the meiosis occur in an organism exhibiting haploidic life cycle and mention the fate of the products thus produced. (1)

**SECTION B**

6. You are conducting artificial hybridization on papaya and potato. Which one of them would require the step of emasculation and why? However for both you will use the process of bagging. Justify giving one reason. (2)

7. How would the gene flow or genetic drift affect the population in which either of them happen to take place? (2)
8. Differentiate between the roles of B-lymphocytes and T-lymphocytes in generating immune responses.

**OR**

Principle of vaccination is based on the property of “memory” of the immune system. Taking one suitable example, justify the statement. (2)

9. Explain the relevance of "Totipotency" and "Somaclones" in raising healthy banana plants from virus infected banana plants. (2)
10. How is a continuous culture system maintained in bioreactors and why? (2)
11. List any four ways by which GMO's have been useful for enhanced crop output. (2)
12. Mention four significant services that a healthy forest ecosystem provide. (2)

**OR**

Substantiate with the help of one example that in an ecosystem mutualists (*i*) tend to co-evolve and (*ii*) are also one of the major causes of biodiversity loss.

### SECTION C

13. Pollen banks are playing a very important role in promoting plant breeding programme the world over. How are pollens preserved in the pollen banks? Explain. How are such banks benefitting our farmer? Write any two ways. (3)
14. Draw a labelled diagram to show interrelationship of four accessory ducts in a human male reproductive system. (3)

**OR**

Draw a sectional view of the human ovary showing the different stages of developing follicles, corpus luteum and ovulation.

15. Compare in any three ways the chromosomal theory of inheritance as proposed by Sutton and Boveri with that of experimental results on pea plant presented by Mendel. (3)

**OR**

(a) Explain linkage and recombination as put forth by T.H. Morgan based on his observations with *Drosophila melanogaster* crossing experiment.

(b) Write the basis on which Alfred Sturtevant explained gene mapping.

16. Explain the mechanism of DNA replication with the help of a replication fork. What role does the enzyme DNA-ligase play in a DNA replication fork? (3)

**OR**

Construct and label a transcription unit from which the RNA segment given below has been transcribed. Write the complete name of the enzyme that transcribed this RNA.



17. (a) Write two differences between *Homo erectus* and *Homo habilis*. (3)
- (b) Rearrange the following from early to late geologic periods:  
Carboniferous, Silurian, Jurassic.
18. Name the group of bacteria involved in setting milk into curd. Explain the process they carry in doing so. Write another beneficial role of such bacteria. (3)

(2)

19. Bee keeping practice is a good income generating industry. Write the different points to be kept in mind for successful bee keeping. Write the scientific name of the most common Indian species used for the purpose. (3)

20. (a) Match the microbes listed under Column A with the products mentioned under Column B. (3)

**Column A**

(H) *Penicillium notatum*

(I) *Trichoderma polysporum*

(J) *Monascus purpurea*

(K) *Saccharomyces cerevisiae*

(b) Why does 'Swiss Cheese' develop large holes?

**Column B**

(i) Statin

(ii) ethanol

(iii) antibiotic

(iv) Cyclosporin-A

21. Describe the formation of recombinant DNA by the action of EcoRI. (3)

**OR**

Describe the process of amplification of "gene of interest" using PCR technique.

22. Two children, A and B aged 4 and 5 years respectively visited a hospital with a similar genetic disorder. The girl A was provided enzyme-replacement therapy and was advised to revisit periodically for further treatment. The girl, B was, however, given a therapy that did not require revisit for further treatment. (3)

(a) Name the ailments the two girls were suffering from?

(b) Why did the treatment provided to girl A required repeated visits?

(c) How was the girl B cured permanently?

23. List six advantages of "ex-situ" approach to conservation of biodiversity. (3)

24. While on a visit to a pond in the city-neighbourhood, the visitors were delighted to find large expanse of water covered with colourful algal mass. (3)

(a) As a student of biology, do you agree with their delight? Give reasons in support of your answer.

(b) Explain the cause of such algal growth.

**SECTION D**

25. (a) Explain **one** application of each one of the following:

(A) Amniocentesis

(B) Lactational amenorrhea

(C) ZIFT

(b) Prepare a poster for the school programme depicting the objectives of: "Reproductive and Child Health Care Programme." (3 + 2 = 5)

**OR**

(a) Explain any **two** ways by which apomictic seed can develop.

(b) List **one** advantage and **one** disadvantage of a apomictic crop.

(c) Why do farmers find production of hybrid seeds costly? (2 + 2 + 1 = 5)

26. Differentiate between incomplete dominance and co-dominance. Substantiate your answer with one example of each.

**OR**

- (a) Write the contributions of the following scientists in deciphering the genetic code.  
George Gamow; Hargobind Khorana; Marshall Nirenberg; Severo Ochoa
- (b) State the importance of a Genetic code in protein biosynthesis. (4 + 1 = 5)
27. (a) What is "population" according to you as a biology student?
- (b) "The size of a population for any species is not a static parameter." Justify the statement with specific reference to fluctuations in the population density of a region in a given period of time.

**OR**

- (a) What is hydrarch succession?
- (b) Compare the pioneer species and climax communities of hydrarch and xerarch succession respectively.
- (c) List the factors upon which the type of invading pioneer species depend in secondary hydrarch succession. Why is the rate of this succession faster than that of primary succession? (1 + 2 + 2 = 5)

## Set-II

*Questions which are different from Set I.*

### SECTION A

2. How did Charles Darwin express 'fitness'? (1)

### SECTION B

6. Express the process of pollination in *Vallisneria*. (2)
9. Why is crossbreeding in animals practiced? How is a breed Hisardale developed? (2)
10.  $\beta$  galactosidase enzyme is considered a better selectable marker. Justify the statement. (2)

### SECTION C

13. (a) Differentiate between geitonogamy and xenogamy.
- (b) Write the difference in the characteristics of the progeny produced as a result of the two processes. (3)
18. How does the activity of each one of the following help in organic farming? (3)
- (a) *Mycorrhiza*
- (b) *Cyanobacteria*
- (c) *Rhizobium*

### SECTION D

23. Mention the special adaptations evolved in parasites and why? (3)
25. Where does the process of megasporogenesis start in an angiosperm? Describe the process upto the formation of embryo sac. (5)

**OR**

- (a) Explain the process of fertilization in human.
- (b) Name the embryonic stage that gets implanted in human females. Explain the process of implantation.

(4)

## Set-III

Questions which are different from Set I and Set II.

### SECTION A

2. Write the number of chromosomes body cells of honey bee workers and drone have. (1)

### SECTION B

6. It is said apomixes is a type of asexual reproduction. Justify. (2)
8. Write the steps in sequence as carried in multiple ovulation embryo transfer technology. (2)
9. What is an origin of replication in a chromosome? State its function. (2)

### SECTION C

13. How does a bisexual flowering plant ensures cross pollination? Explain. (3)
18. Effluent from the primary treatment of sewage is passed for secondary treatment. Explain the process till the water is ready to be released into natural water bodies. (3)
24. Explain any two most important levels of biological organisation showing biodiversity with the help of an example each. (3)

### SECTION D

25. (a) Differentiate between spermatogenesis and Oogenesis on the basis of
- (i) Time of initiation of the process
  - (ii) Site of completion of the process
  - (iii) Nature of meiotic division undergone by gamete mother cells
- (b) Name the hormones and state their role involved in controlling spermatogenesis in humans. (5)

### OR

- (a) Explain the process of double fertilization in angiosperms.
- (b) Why does the development of endosperm precedes that of embryo?
- (c) List the parts of a typical dicot embryo. (5)