Time : 3.00 Hours
Maximum Marks : 70

BIOLOGY
CBSE
Sample Question Papers

Self Assessment Paper 1

General Instructions :

(i) *All questions are compulsory.*

(ii) *The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.*

(iii) *Section–A has 14 questions of 1 mark each and 2 case-based questions. Section–B has 9 questions of 2 marks each. Section–C has 5 questions of 3 marks each and Section–D has 3 questions of 5 marks each.*

(iv) *There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.*

(v) *Wherever necessary, neat and properly labelled diagrams should be drawn.*

SECTION 'A'

1. State the fate of a pair of autosomes during gamete formation. **1**

AI **2.** Name any two assisted reproductive technologies that help infertile couples to give children. **1**

3. Write the chromosomal defect in individuals affected with Klinefelter's syndrome. **1**

4. Why a geneticist choose organism with a short life cycle to study variations and patterns of inheritance in living beings **1**

5. Give one example of organism exhibiting female heterogamety. **1**

OR

Give an example of a sex-linked recessive disorder in humans. **1**

AI **6.** Write the conclusion Griffith arrived at the end of his experiment with *Streptococcus pneumoniae*. **1**

7. Name the material used as matrix in gel electrophoresis and mention its role.

AI **8.** What is Biopiracy ? **1**

9. Write the palindromic sequence that EcoRI recognises. **1**

10. Why are mango trees unable to grow in temperate climate ? **1**

Directions : In the following questions 11-14, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

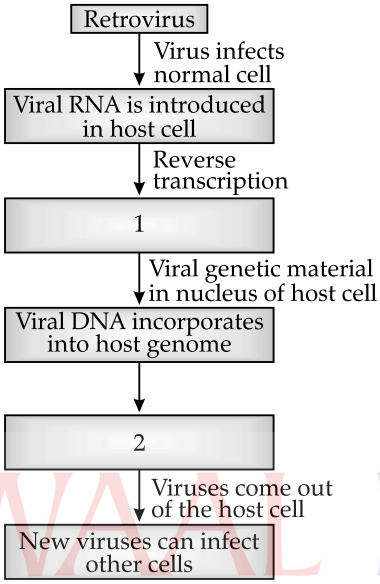
11. Assertion : Cu-T is considered a good contraceptive device to space children.
Reason : Cu-T is a non-hormonal, a non-medicated contraceptive device which increases phagocytosis of sperms. **1**

AI **12.** Assertion : Pea, bean, mustard are non-albuminous seeds.
Reason : These seeds retain a part of endosperm as it is not completely used up during embryo development. **1**

13. Assertion : The enzyme involved in the continuous replication of DNA strand is DNA polymerase
Reason : The polarity of the template strand is 5′ → 3′. **1**

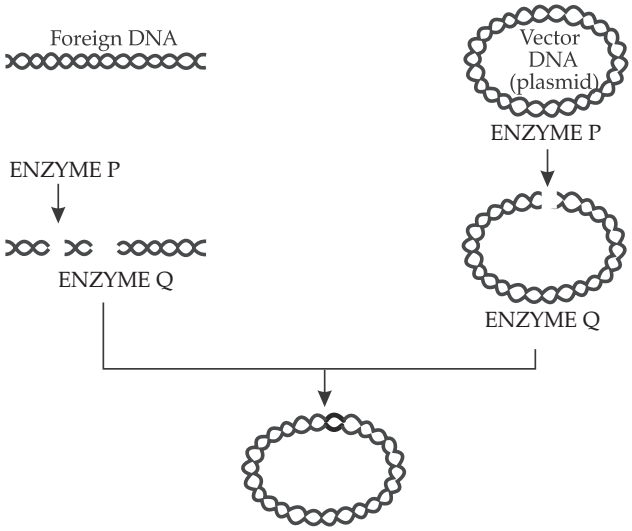
14. Assertion : *Nucleopolyhedrovirus* are useful as they are good biocontrol agents.
Reason : They are species specific, narrow spectrum bioinsecticides. **1**

15. In the given flow diagram, the replication of retrovirus in a host is shown. Observe and answer any of the four questions given below. **4**



(a) Fill in (1) and (2).
(b) Why is the virus called retrovirus?
(c) Choose the correct option regarding retrovirus.
(i) a RNA virus that can synthesis DNA during infection.
(ii) a DNA virus that can synthesis RNA during infection.
(iii) a ssDNA virus.
(iv) a ssRNA virus.
(d) Can the infected cell survive while viruses are being replicated and released?
(e) Retroviruses have no DNA. However the DNA of the infected host cell does possess the viral DNA. How is it possible?

AI **16.** Study the given diagram and answer any of the four questions given below. **4**



(a) Name the enzymes 'P' and 'Q' that are involved in the processes given below:

(i) Enzyme P- Exonuclease and Enzyme Q- Permease.

(ii) Enzyme P- Exonuclease and Enzyme Q- Ligase.

(iii) Enzyme P- Endonuclease and Enzyme Q- Permease.

(iv) Enzyme P- Restriction endonuclease and Enzyme Q- Ligase.

(b) The role of enzyme 'Q' in the construction of a recombinant DNA molecule is :

(i) formation of phosphodiester bond between two DNA fragments.

(ii) formation of hydrogen bonds between sticky ends of DNA fragments.

(iii) ligation of all purine and pyrimidine bases.

(iv) None of the above.

(c) Mention the role of enzyme 'P' in Recombinant DNA technology.

(d) A bacterial cell was transformed with a recombinant DNA that was generated using a human gene. However, the transformed cells did not produce the desired protein. Reasons could be :

(i) human gene may have intron which bacteria cannot process.

(ii) amino acid codons for humans and bacteria are different.

(iii) human protein is formed but degraded by bacteria.

(iv) All of the above.

(e) Name the specific sequence of DNA in a plasmid that the gene of interest ligates with to enable it to replicate.

SECTION 'B'

17. Mention the relationship between concentration of luteinizing hormone and maintenance of endometrium in the human uterus.

18. How Down's syndrome is different from Turner's syndrome. **2**

19. Differentiate between the roles of B-lymphocytes and T-lymphocytes in generating immune responses. **2**

20. List any four ways by which GMO's have been useful for enhanced crop output. **2**

21. State 'two' observations made by German naturalist, Alexander Von Humboldt during his extensive explorations in South American jungles.

AI **22.** How does predation differ from parasitism ?

OR

How plants have evolved defence mechanism against their predators. Give two examples.

23. Which of these tropical or temperate region show greatest levels of species diversity ? Give reason in support of your answer ? **2**

AI **24.** Draw and explain a logistic curve for a population of density (N) at time (t) whose intrinsic rate of natural increase is (r) and carrying capacity is (K). **2**

AI **25.** Mention the product and its use produced by each of the microbes listed below :

(i) *Streptococcus*

(ii) *Lactobacillus* **2**

SECTION 'C'

AI **26.** **(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**

AI **27.** **(a)** What are transcriptional products of RNA polymerase III?
(b) Differentiate between "Capping" and "Tailing".
(c) Expand hnRNA. **3**

28. **(i)** Name the causative agent of typhoid in humans.
(ii) Name the test administered to confirm the disease.
(iii) How does the pathogen gain entry into the human body ? Write the diagnostic symptoms and mention the body organ that gets affected in severe cases.

AI **29.** Name the most commonly used bioreactor in biotechnology labs. Mention the most essential components this bioreactor must have so as to provide the optimum conditions to the culture medium, resulting in production of large volumes of desired product. **3**

OR

What is biopiracy? It should be prevented. State why and how ?

AI **30.** Differentiate between an 'Expanding age pyramid' and a 'Stable age pyramid'. Substantiate your answer with diagrams. **3**

SECTION 'D'

AI **31.** **(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

Angiosperm flowers may be monoecious, cleistogamous or show self-incompatibility. Describe the characteristic features of each one of them and state which one of these flowers promotes inbreeding and out-breeding respectively. **5**

AI **32.** **(i)** Describe the structure and function of a tRNA molecule. Why is it referred to as an adapter molecule ?
(ii) Explain the process of splicing of hnRNA in an eukaryotic cell. **5**

OR

(a) Write the contributions of the following scientists in deciphering the genetic code.
George Gamow; Har Gobind Khorana; Marshall Nirenberg; Severo Ochoa.
(b) State the importance of a Genetic code in protein biosynthesis. **5**

33. Describe the process of secondary treatment given to municipal waste water (sewage) before it can be released into fresh water bodies. Mention another benefit provided by this process. **5**

OR

(a) Differentiate between active and passive immunity.
(b) Comment on the role of vaccination and immunization in keeping human population healthy. **5**

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