Biology

General Instructions :

(i) *There are a total of **26** questions and five sections in the question paper. **All** questions are compulsory.*

(ii) *Section **A** contains questions number **1** to **5**, very short-answer type questions of **1** mark each.*

(iii) *Section **B** contains questions number **6** to **10**, short-answer type I questions of **2** marks each.*

(iv) *Section **C** contains questions number **11** to **22**, short-answer type II questions of **3** marks each.*

(v) *Section **D** contains question number **23**, value based question of **4** marks.*

(vi) *Section **E** contains questions number **24** to **26**, long-answer type questions of **5** marks each.*

(vii) *There is no overall choice in the question paper, however, an internal choice is provided in one question of **2** marks, one question of **3** marks and all the three questions of **5** marks. In these questions, an examinee is to attempt any one of the two given alternatives.*

[SECTION A]

1. Name two restriction enzymes used in recombinant DNA technology.
2. What name is given to the agents which transform normal cells to cancerous cells? Give one example of ionising and non-ionising agents.
3. Which chemicals cause inflammatory response due to allergy?
4. What are exotic species?
5. Which technique can be acquire by the female, if a male is unable to inseminate the female due to very low sperm counts in the ejaculate?

[SECTION B]

6. What is amniocentesis? Give its significance.
7. Write two functions of methanogens and also give examples.
8. Draw the labelled diagram of nucleosome.
9. What is the location and function of sporopollenin?
10. During the secondary treatment of primary effluent, how does the significant decrease in BOD occur?

[SECTION C]

11. Name and explain the type of barrier of innate immunity, where some cells release interferon when infected.

12 (i) What are primary lymphoid organs present in humans?
(ii) Explain the functions of lymphoid organs.

13. If you are a manager of a dairy farm. What measures would you undertake to improve the quality and quantity of milk production?

14. Some ornithologists observed decline in the bird population in an area of a lake, after the setting of an industrial unit in the same area, explain the reason.

15. Differentiate between spermatogenesis and spermiation.

16. In an angiosperm, the embryo sac is haploid, zygote is diploid and endosperm is triploid. Justify giving reasons of each stage.

17. Ilustrate the amplification of a gene sample of interest carried out using Polymerase Chain Reaction (PCR) diagrammatically.

18. Describe the MOET technique for herd improvement. Name any two animals for which this technology can be used.

19. What are CFCs? Explain their contribution in ozone depletion. List out the harmful effects of ozone depletion.

20. Draw a well labelled diagram of ovary and mark the following.
(i) Primary follicle (ii) Ovum
(iii) Graafian follicle (iv) Corpus luteum

21. Define the following terms.
(i) Apomixis
(ii) Polyembryony
(iii) Emasculation

22. Few gaps have been left in the following table. Fill them up.

Term	Meaning
_____	Non-coding sequence in eukaryotic DNA
_____	Technique used in solving paternity dispute
Restriction endonuclease	_____
Plamid	_____
Transgenics	_____
_____	Nucleotide sequences with single base differences

[SECTION D]

3 A married couple is facing the problem of infertility. They are not in the position to afford the high cost of Assisted Reproductive Technologies (ARTs).

(i) Name some ARTs which the couple can adopt but cannot afford.

(ii) What is the best method of enjoying parenthood in our country for such couples?

[SECTION E]

24 **(a) Describe the endosperm development in coconut.**

(b) Why is tender coconut considered a healthy source of nutrition?

(c) How are pea seeds different from castor seeds with respect to endosperm?

OR

Describe the post-zygotic events leading to implantation and placenta formation in humans. Mention any two functions of placenta

25 **(a) Why is haemophilia generally observed in human males? Explain the conditions under which a human female can be haemophilic.**

(b) A pregnant human female was advised to undergo MTP. It was diagnosed by her doctor that the foetus she is carrying has developed from a zygote formed by an XX-egg fertilized by Y-carrying sperm. Why was she advised to undergo MTP?

OR

"DNA replication is semi-conservative". Name the scientists who proposed it and who proved it. How was it proved experimentally? Explain.

26 **(a) Name the population growth pattern the equation $\frac{dN}{dt} = rN$ represents. What does "r" represent in the equation? Write its importance in population growth.**

(b) Explain the principle of carrying capacity by using population Verhulst-Pearl logistic growth curve.

OR

(i) A decade back, the enormous vehicular traffic in Delhi had made Delhi rank 4th among polluted cities of the world. Two measures taken by the Delhi Government brought marked improvement in air quality by 2005. What were these two measures and how did they reduce air pollution?

(ii) What is the norm set by Euro II for petrol and diesel vehicles?

(3 + 2 = 5 marks)