

GENERAL INSTRUCTIONS :

- There are a total of 27 questions and five sections in the question paper. All questions are compulsory.
- **Section – A** contains question numbers 1 to 5, multiple choice questions of one mark each.
- **Section – B** contains question numbers 6 to 12, short answer type I questions of two marks each.
- **Section – C** contains question numbers 13 to 21, short answer type II questions of three marks each.
- **Section – D** contains question numbers 22 to 24, case – based short answer type question of three marks each.
- **Section – E** contains question numbers 25 to 27, long answer type questions of five marks each.
- There is no overall choice in the question paper. However, internal choices are provided in two questions of one mark, one question of two marks, two questions of three marks and all three questions of five 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.

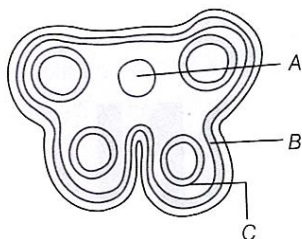
SECTION A

1. Most common honey bee species in India
 (a) *Apis indica* (b) *Apis florae* (c) *Apis mellifera* (d) *Apis dorsata*

OR

HIV that causes Acquired Immuno Deficiency Syndrome (AIDS) reduces the number of

- (a) B – cells (b) cytotoxic T – cells (c) helper T – cells (d) All of these
2. Name the labelled parts A, B and C in the following diagrams of TS of a young anther.



- (a) A – Tapetum; B – Connective; C – Endothecium
 (b) A – Endothecium; B – Connective; C – Tapetum
 (c) A – Connective; B – Tapetum; C – Endothecium;
 (d) A – Connective; B – Endothecium; C – Tapetum
3. While isolating DNA from bacteria, which of the following is not used?
 (a) lysozyme (b) Ribonuclease (c) Deoxyribonuclease (d) Protease

OR

Given below are few statements with regards to restriction enzyme.

- (i) it recognises a palindromic nucleotide with regards to restriction enzyme.
 (ii) it produces the same kind of sticky ends in different DNA molecules.
 (iii) it is isolated from viruses.
 (iv) it ligates all purine and pyrimidine bases.

Which of the above mentioned statements are true for restriction enzymes?

4. What is common to the techniques (i) in vitro fertilisation, (ii) Cryopreservation and (iii) Tissue culture?
 (a) all are in situ conservation methods
 (b) all are ex situ conservation methods
 (c) all require ultra modern equipments and large space
 (d) all are methods of conservation of extinct organisms.

5. Which of the following is not required for a PCR reaction?
- (a) primers (b) ddNTPs
(c) Template DNA (d) A thermostable DNA polymerase

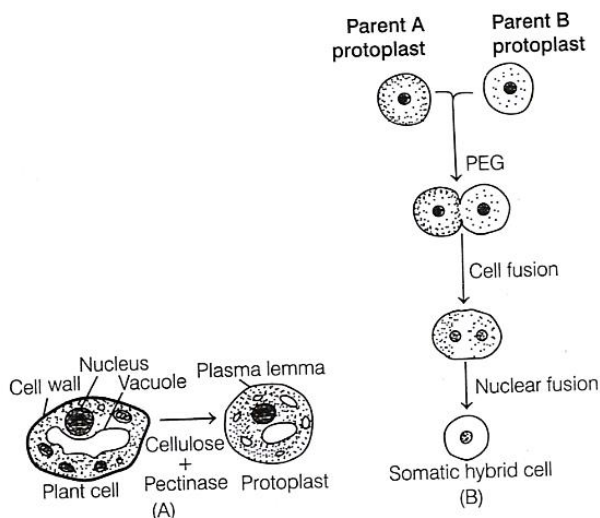
SECTION B

6. There is a statutory warning on the packets of cigarettes which warns against smoking and says that it is injurious to health. Yet, smoking is prevalent in our society. Suggest a few points advising the importance of avoiding smoking.

OR

Drugs like LSD, barbiturates, amphetamines, etc., are used as medicines to help patients with mental illness. However, their excessive doses and abusive usage are harmful. Enlist some major adverse effects of abuse of such drugs in people.

7. State the cause being the discontinuous synthesis of DNA on one parental strand. What happens to the short stretches of DNA that are synthesised during this process?
8. GM crops are tailor made plants used in many forms for human welfare. However, they are also known to have certain disadvantages which can make them unpopular as compared to their conventional forms. Provide atleast two evidences in support of the above mentioned claim and defend the progress of GMOs in present situation.
9. Examine the two events A and B of somatic hybridisation given below.



Describe the procedure of the technique somatic hybridisation.

10. What is the main idea behind ‘Joint Forest management Concept’ introduced by the Government of India?
11. A female in your locality does not menstruate even after puberty. Doctor has told that she lacks one X – chromosome (44 + XO),. Suggest the name for this syndrome and state some other symptoms.
12. Through each pollen grain has two male gametes, atleast 10 pollen grains (not 5) are required to fertilise 10 ovules present in particular carpel. Provide a suitable explanation for the above chain.

SECTION C

- 13. Coextinction is one of the factors which results in the loss of biodiversity threatening the extinction of flora and related fauna. Substantiate this statement by giving examples. Also, mention other factors which together with Coextinction from evil quartet responsible for the loss of biodiversity.
- 14. Explain the hormonal control of spermatogenesis in humans regulated by hormones FSH and LH.

OR

Name and explain the surgical methods advised to humans males and females as a means of birth control. Mention its one advantage and one disadvantage

- 15. Scientists believe that the evolution is gradual. But extinction as a part of evolutionary story, are 'sudden' and 'abrupt' and also group specific. Can you predict whether a natural disaster can be the cause for extinction of species?
- 16. How do biocontrol agents control the target species? Explain by giving some important examples?

OR

(i) What would happen if a large volume of untreated sewage is discharged into a river?

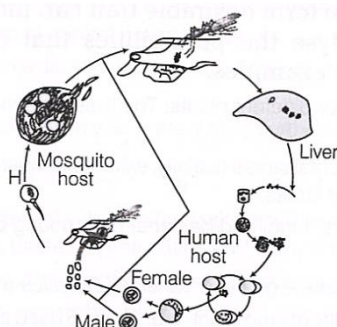
(ii) In what way anaerobic sludge digestion is important in the sewage treatment?

- 17. With the help of an example can you highlight how genetically modified plants can
 - (a) Reduce the usage of chemical pesticides?
 - (b) Enhance the nutritional value of food crops?
- 18. (i) for the expression of traits, genes provide only the potentiality and the environment provides the opportunity. Comment on the veracity of the statement.
 (ii) in order to obtain the F₁ – generation, Mendel pollinated a pure breeding tall plant with a pure breeding dwarf plant. But for obtaining the F₂ – generation, he performed self – pollination of the tall F₁ – plants. Why?
- 19. Plant breeding is the purposeful manipulation of plant species to create plants with desirable traits. However, the term desirable trait can indicate different things for different plants or the breeder. Analyse the possibilities that can be included with in the term desirable traits with suitable examples.
- 20. (i) identify A, B and C in the table given below

Pattern of Inheritance	Monohybrid F ₁ Phenotypic Expression
Codominance	Dominant trait
Dominance	Progeny resembled only one of the parents
Incomplete dominance	Phenotype obtained in between of two parental traits

(ii) You are given tall pea plant with yellow seeds, whose genotypes are unknown. How would you find the genotype of this plant? Explain with the help of cross.

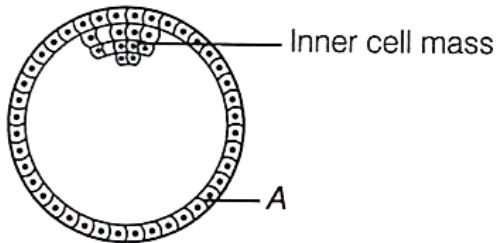
- 21. Refer to the diagram given below and answer the questions that follows.



- (i) The sexual stages of parasite are referred to as? Where does the fertilisation and development of parasite take place in mosquito body?
- (ii) What are sporozoites?
- (iii) What is the cause of cycle of fever during malaria?

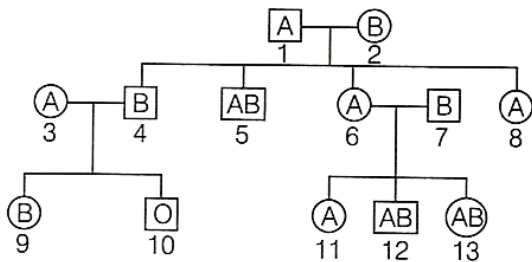
SECTION D

22. Study the figure given below and answer the questions that follows.



- (i) Name the stage of human embryo the figure represents.
- (ii) Identify 'A' in the figure and mention its function.
- (iii) Mention the fate of the inner cell mass after implantation in the uterus.
- (iv) Where are the stem cells located in this embryo?

23.



Study the given pedigree chart showing the inheritance pattern of blood group in a family and answer the following questions.

- (i) Give the possible genotypes of the individual 1 and 2.
 - (ii) Which antigen(s) will be present on the plasma membranes of RBCs of individual 5 and 10?
 - (iii) Give the genotype of the individuals 3 and 4.
24. Two types of aquatic organisms in a lake show specific growth patterns as shown below, in a brief period of time. The lake is adjacent to an agricultural land extensively supplied with fertilisers.

