

**General Instructions:**

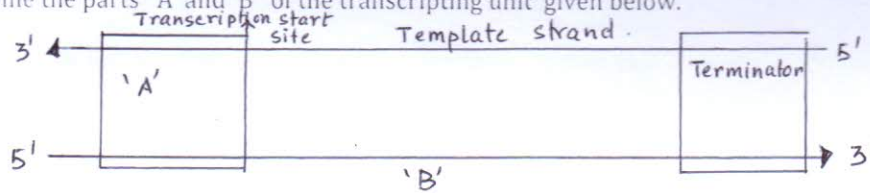
(i) All questions are compulsory.

(ii) The question paper consists of four sections A, B, C, D and E. Section–A contains 5 questions (q no 1 -5) of 1 mark each. Section–B is of 5 questions (q no 6-10) of 2 marks each. Section–C is of 12 questions (q no 11-22) of 3 marks each and Section–D contains. Q no 23 which is a value based question and carries 4 marks. Section–E is of 3 questions (q no 24-26) of 5 marks each.

(iii) There is no overall choice. However, an internal choice has been provided in one question of 2 marks, one question of 3 marks and all the three questions of 5 marks weightage. A student

**Section A**

1. Are Pollination and fertilisation necessary in Apomixis ? Give reasons. 1
2. How can a child have blood group O when his father and mother are having blood group A and B respectively? 1
3. By what process the mung beans are made resistant to yellow mosaic virus? 1
4. Name the parts 'A' and 'B' of the transcribing unit given below. ½×2



5. Name the technique used for separating DNA fragments in the laboratory. Which property of DNA was used in the technique? 1

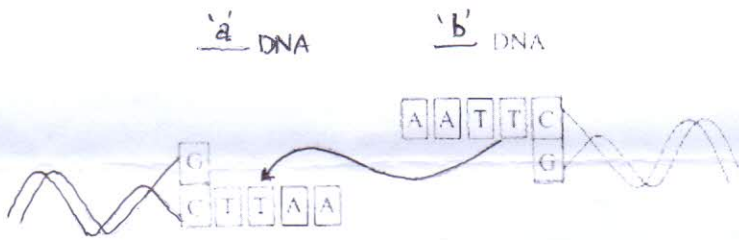
**Section B**

6. i) How many microspore mother cells would be required to produce 100 pollen grains in pollen sac? Why?  
 ii) How are pollens stored in a bank? (1+1=2)
  7. During medical investigation, an infant was found to possess an extra chromosome 21. What was the probable cause of the genetic disorder? Name the genetic disorder. Discuss two symptoms the child is likely to develop later in the life. (½ + ½ + 1 = 2)
  8. It is essential to make the bacterial cells 'competent' in recombinant DNA technology. What does the term 'competent' refer to? Why the bacterial cells must be made competent? (1+1=2)
  9. Name the bacteria which act as the source of Bt toxin. Why does the bacterial toxin (Bt toxin) kill only the insects and not the bacteria? ½+1½
- OR
- i) A farmer adds Azotobacter culture to the soil before sowing maize. How does it increase the yield of maize? 1

- ii) A patient who is suffering from myocardial infection is given a clot buster as part of his treatment. Mention the clot buster administered and its microbial source.

OMIT

10. The following illustrates the linking of DNA fragments:  
( $\frac{1}{2} \times 4 = 2$ )



- (i) Name 'a' and 'b'.

$\frac{1}{2} + \frac{1}{2}$

- (ii) Name the restriction enzyme that recognises this palindrome.

$\frac{1}{2}$

- (iii) Name the enzyme that can link the two DNA fragments.

$\frac{1}{2}$

#### Section C

11. When a garden pea plant with violet flowers was crossed with violet flowers, 50% of the progeny bore violet flowers.

- i) Work out the cross.

1

- ii) Name the type of the cross and mention its significance.

$\frac{1}{2} + \frac{1}{2}$

- iii) How does the inheritance pattern of flower colour in Snap dragon differ from the above?

1

OR

- i) Linkage and crossing over are alternatives to each other. Justify.

$1\frac{1}{2}$

- ii) Why did Morgan prefer to work with fruitflies? State three reasons.

$1\frac{1}{2}$

12. i) Draw the structure of the initiator tRNA adaptor molecule.

2

- ii) Why is tRNA called an adaptor molecule?

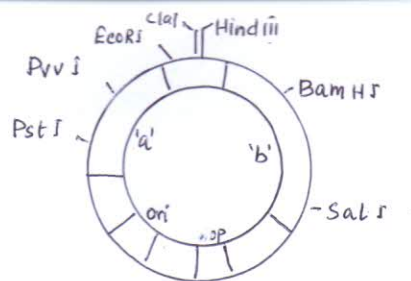
1

13. i) Explain the role of baculoviruses as biological control agents. Mention their importance in organic farming.

1+1=2

- ii) Curd is more nutritious than milk. Why?

1



14. i) Identify the selectable markers in the diagram of E coli vector shown above. 1  
 ii) How is the coding sequence of B-galactosidase considered a better marker than the ones identified by you in the diagram? Explain 2
15. Continued self pollination result in "inbreeding depression". Discuss three out breeding devices to encourage crosspollination. 3
16. Mention the role of Pituitary hormones in females during menstrual cycle. 3
17. The pathogen of a disease depends on RBCs of human for growth and reproduction . The person with this pathogen suffers with chills and high fever.  
 i) Identify the disease and the pathogen. ( ½ +½)  
 ii) What is the cause of the chills and fever? 1  
 iii) Suggest two preventive measures to control the spread of the disease. 1
18. Biofortification is considered the most practical means to improve the public health. Justify. Explain taking three examples. (1½+1½)
19. i) Why Nematode specific genes are introduced into the tobacco plants using a suitable vector? 1  
 ii) Name the vector used in the process. ½  
 iii) Explain the events that occur in the tobacco plant. 1½
20. i) What does Gene therapy mean? 1  
 ii) Name the hereditary disease for which the first clinical gene therapy was used. ½  
 iii) Mention the steps of gene therapy used to treat the disease. 1½
21. How is the amplification of a gene sample of interest carried out using Polymerase Chain Reaction (PCR)? 3
22. Name the regulator gene and inducer of the Lac operon in Bacteria. Explain their role in gene regulation in brief. (½+ ½+ 2)

#### Section D

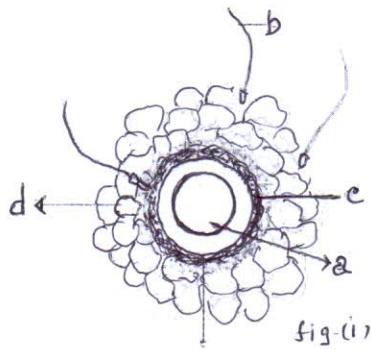
Value based question

23. Abhay and his wife are married for the last 8 years , but they donot have their own child. They have undergone various tests in infertility clinics and the reports showed Abhay to be infertile. Anu's in laws are not accepting the truth and are blaming Anu for being childless. However, the couple went to the doctor and decided to proceed with ART.  
 i) Do you think Anu's in laws are correct for not accepting the truth and blaming her for the infertility? Give reasons in support of your answer. (½+1)  
 ii) What are the ways by which this couple could be assisted to have their own child? 1½  
 iii) What values are shown by the couple? 1

#### Section E

24. (a) Draw a diagrammatic sectional view of a mature anatropous ovule and label the following parts in it: (1½+2½)  
 (i) that develops into seed coat.  
 (ii) that develops into an embryo after fertilisation.  
 (iii) that develops into an endosperm in an albuminous seed.  
 (iv) through which the pollen tube gains entry into the embryo sac.  
 (v) that attaches the ovule to the placenta.  
 b) Pistil of a flower does not accept pollen from any plant other than from its own kind. How does it happen? Explain 2 |

OR



- (i) Identify 'a'. ½  
(ii) Name and state the function of 'c'. 1  
(iii) Identify 'd'. ½  
(iv) Explain in the brief the process represented by the fig. (1) 1  
(v) Draw a diagram of 'b' separately and label the parts: 2  
— that help its entry into 'a';  
— that carry genetic material;  
— that help in its movement

25. (a) Describe the various steps of Griffith's experiment that led to the conclusion of the 'Transforming Principle'. 3  
(b) The male fruit fly and female fowl are heterogametic while female fruit fly and male fowl are homogametic. Why are they called so? 2

OR

DNA replication takes place in semiconservative method..

- a) i) Explain the term "semiconservative". 1  
ii) Describe the discontinuous synthesis of DNA. 3

b) 5' AUG ACC UUU CAC UUC GUG UAA 3' ---mRNA

Met Thr Phe His Phe Val ----- Translated polypeptide

Infer any two properties of genetic code with examples from the given information. 1

26. a) Name the category of microbes occurring naturally in sewage and making it less polluted during the treatment. 1  
(b) Explain the different steps involved in the secondary treatment of sewage. 4

OR

- a) i) What is the programme called that is involved in improving success rate of production of desired hybrid and herd size of cattle? ½  
(ii) Explain the method used for carrying this programme for cows. 2  
b) What is micropropagation? Why are the plants produced by micropropagation called somaclones? (1 +1)  
c) Name the technique by which healthy plants can be recovered from the diseased plants ½

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8/8/17