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H-6522

M.Sc. (II Semester) Examination, 2022

ZOOLOGY

Paper - II

(Principles of Gene Manipulation)

Time Allowed: Three Hours

Maximum Marks: 70

Section-A

Note:- Attempt any ten questions. Each question carries one mark.

Q.I. Objective Type Questions **1x10**

1. An example of RNA dependent DNA polymerase is.....
2. *Taq* polymerase is isolated from bacteria .....
3. The organism of choice for heterologous production of insulin would be.....
4. An example of retro-virus based vector is .....
5. SCID, a disease that can be cured by Gene therapy, is due to the deficiency of.....enzyme.

6. Name the first transgenic plant to have been developed is.....
7. The Klenow fragment is obtained by:
   a) DNA Polymerase-I b) DNA Polymerase-II
   c) RNA Polymerase-II d) Reverse transcriptase
8. The expression of a transgene in the target tissue is identified by:
   a) Promoter b) Reporter
   c) Adapter d) None of the above
9. Which of the following is associated with DNA-fingerprinting?
   a) Hybridoma b) RFLP
   c) Site Specific Recombination d) Microarray
10. The PCR variant used for detection of COVID-19 infection is:
    a) Real Time PCR b) Hot Start PCR
    c) Reverse Transcriptase PCR d) Touch Down PCR
11. The main aim of the human genome project was to identify and sequence all the genes present in the human genome. **(State whether true or false).**
12. A vector into which a gene of interest has been inserted may be called as a recombinant DNA. **(State whether true or false).**

Section-B

Note:- Attempt any five questions. Each question carries two marks.

Q. II. Very Short Answer Type (25-30 Words) 2x5

1. Define recombinant DNA?
2. Define vector.
3. What are components present in PCR master mix?
4. What is a restriction map?
5. What are GMOs?
6. Define DNA fingerprinting.
7. What is meant by DNA sequencing?

Section-C

Note:- Attempt any five questions. Each question carries four marks.

Q.III. Short Answer Type (250 Words) 4x5

1. Differentiate between genomic and cDNA library.
2. Differentiate between cloning and expression vectors.
3. Briefly describe southern blotting technique.
4. Describe DNA-microinjection based technique of gene transfer

in animals.

5. Briefly describe site directed mutagenesis.
6. Discuss the properties of a good cloning vector.
7. Give a brief account on DNA microarrays.

Section-D

Note:- Attempt any three questions. Each question carries ten marks.

Q.IV. Essay type (more than 500 Words) 3x10

1. Give a detailed account on various enzymes used in genetic engineering along with their functions.
2. Briefly describe the steps involved in PCR. Also write a short account on types and applications of PCR.
3. Describe protein engineering in microbes with suitable examples.
4. What is meant by gene therapy? Discuss somatic and germline gene therapy approach in brief.