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DCZO401

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IV Semester B.Sc. Degree Examination, September - 2023

ZOOLOGY

Gene Technology , Immunology and Computational Biology

Paper : IV

(NEP Scheme Semester Freshers)



Time : 2½ Hours

Maximum Marks :60

Instructions to Candidates:

- 1) Draw neat labelled **diagrams** wherever necessary.
- 2) Answers should be completely in English only.

PART - A

I Answer the following in One word or One sentence.

(5×1=5)

1. Which vector is used in SCID gene therapy?
2. Mention the function of Von kupffer cells.
3. Define isograft.
4. Expand ANOVA
5. Find the mode of the given data:
12, 8, 4, 8, 1, 8, 9, 11, 9, 10, 12, 8

PART - B

II Answer any FIVE of the following

(5×3=15)

1. Mention the function of the following enzymes in gene cloning.
 - a) Restriction enzyme
 - b) DNA ligase
 - c) Alkaline phosphatase.
2. Write a note on lipofection.
3. What are Biosensors? Mention any two applications of it.

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4. Write a note on APC cells in Immunity.
5. Define vaccine. Mention any two types.
6. List any three applications of Bioinformatics.
7. A bag contains 4 red balls and 6 yellow balls. 3 balls are drawn at random. What is the probability of getting a red ball?

PART - C

III. Answer any FOUR of the following.

(4×5=20)

1. Explain the steps involved in recombinant DNA technology.
2. What are antigens? Explain its properties.
3. Describe the structure of IgG antibody with a neat labelled diagram.
4. Describe immunity against bacterial infection.
5. What is a histogram? Prepare a histogram from the following data recorded on number of tillers of wheat variety.

No. of tillers per plant	0-6	6-12	12-18	18-24	24-30	30-36
No. of Plants	4	8	15	20	12	6

6. Calculate arithmetic mean from the following data.

No. of seeds per plant	100-200	200-300	300-400	400-500	500-600	600-700
Number of plants	8	18	20	26	30	28

PART - D

IV. Answer any TWO of the following.

(2×10=20)

1. Explain the production of monoclonal antibodies with a neat labelled diagram.
 2. Describe the structure of MHC-I and MHC-II complex.
 3. Explain :
 - a) Graft rejection mechanism
 - b) Sequence alignment - FASTA.
 4. Calculate the mean, median, variance and standard deviation from the following data, recorded on the number of clusters in a variety of blackgram:
No. of Clusters: 8, 10, 10, 10, 12, 13, 15, 15, 17, 20.
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