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PG CBCS

M.Sc. Semester-I Examination, 2021

ZOOLOGY

PAPER: ZOO 103

(IMMUNOLOGY AND METHODS IN BIOLOGY)

Full Marks: 40 **Time: 2 Hours**

Write the answer for each unit in separate sheet

UNIT- ZOO 103.1

Immunology

Answer any TWO questions of the following: **2X10=20**

1. Write the properties of HSC? Discuss about the criteria to regulate immunogenicity. What do you mean by Affinity and Avidity? Give example 2+4+4
2. Discuss how MHC is involved in presentation of endogenous antigen. What is β2 macroglobulin? Why it is considered as belonging to immunoglobulin superfamily? 6+2+2
3. Differentiate between primary and secondary lymphoid organ. Enumerate the relationship between cell mediated and humoral immunity. What are NK cells and APC? Give example 2+4+2+2
4. Give a short note on Adjuvant. Mention the origin of T and B lymphocyte. Briefly describe the Thymic selection process. 3+2+5
5. Write notes on (any two) 5+5
   - i) Titer
   - ii) Southern blotting hybridization
   - iii) MAC formation through classical complement pathway
   - iv) Lymphoid organs

UNIT- ZOO 103.2

Methods in Biology

Answer any TWO questions from the following: **2X10=20**

1. Mention some of the advantages and disadvantages of bioremediation. How do bacteria protect their own DNA from their own restriction enzymes? What do you mean by isoelectric focusing? Give an example of type- II restriction endonuclease. 4+3+2+1
2. Briefly describe the construction process of Oil Eating Bug or Super Bug. What are the characteristic features of a typical expression vector? What is cryopreservation? Mention its application. 5+3+2
3. What is Bioremediation? Explain different types of *in-situ* and *ex-situ* bioremediation processes. What is 2D gel electrophoresis? What is VNTR? Give example. 2+4+2+2
4. State the principle and advantages of Fourier Transform Infrared (FT-IR) spectrometry. Write the principle and application of Affinity chromatography. 5+5
5. Write the principle of SDS PAGE. Mention the application of Agarose gel electrophoresis. State the importance of Tm value in PCR. Distinguish between cosmid vector and shuttle vector. 3+2+2+3

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