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PG CBCS

M.Sc. Semester-I Examination, 2023

ZOOLOGY

PAPER: ZOO 103

(IMMUNOLOGY AND METHODS IN BIOLOGY)

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

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Write the answer for each unit in separate sheet

UNIT: ZOO 103.1
IMMUNOLOGY

GROUP-A

1. Answer any TWO from the following questions: **2×2=4**

a) What are primary and secondary lymphoid organs? Give example.
b) What do you mean by Affinity and Avidity?
c) Write the function of helper T-cell and cytotoxic T-cell.
d) What do you mean by anaphylatoxin?

GROUP-B

2. Answer any TWO from the following questions: **2×4=8**

a) What is Adjuvant? Give example. State its mode of action. 1+3
b) Name two reporter enzymes and their respective chromogenic substrate frequently used in immunohistochemistry (IHC). Illustrate the direct and indirect IHC method with suitable diagram. 1+3
c) What are Antigen presenting cells (APC's)? Give example. Discuss endogenous pathway of antigen processing and presentation with proper illustration. 1+3
d) Briefly describe Sandwich ELISA along with its applications.

GROUP-C

3. Answer any ONE from the following questions: **1×8=8**

a) Describe the structure and functions of immunoglobulin (Ig) molecule.
b) Distinguish between MHC Class I and MHC Class II.
c) Write short notes on **(any two)**
   i. ADCC
   ii. Classical pathway of complement
   iii. RIA
   iv. Thymic selection of T-cell

(P.T.O.)

UNIT: ZOO 103.2
METHODS IN BIOLOGY

GROUP-A

4. Answer any TWO from the following questions: 2×2=4

a) What are the characteristic features of a typical BAC vector?
b) What is isoelectric focusing?
c) What are biofertilizers?
d) Write the principle and application of Agarose Gel Electrophoresis.

GROUP-B

5. Answer any TWO from the following questions: 2×4=8

a) What is the principle of ultra-centrifugation process? What is density gradient ultra-centrifugation? 2+2
b) Give detailed account on different phytoremediation processes. Name some of the enzymes responsible for bioremediation. 3+1
c) How do bacteria protect their genomic DNA from their own restriction enzymes?
d) How do you design a primer for PCR? What are the advantages of using Taq DNA polymerase? 3+1

GROUP-C

6. Answer any ONE from the following questions: 1×8=8

a) What are the ideal physio-chemical parameters for bio-degradation process? Write note of superbug. 5+3
b) b) Briefly describe the Liquid chromatography-mass spectroscopy (LC-MS). What is the purpose of FISH technique? 6+2

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