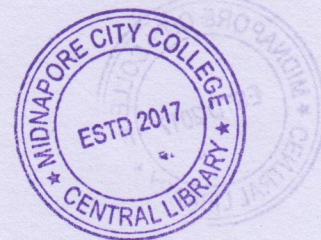


**PG (NEW) CBCS**  
**M.Sc. Semester-I Examination, 2018**  
**ZOOLOGY**  
 PAPER: ZOO-103  
 (Immunology and Methods in Biology)

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

The figures in the margin indicate full marks.

Candidates are required to give their answer in their own words as far as practicable.

Illustrate the answers whenever necessary.

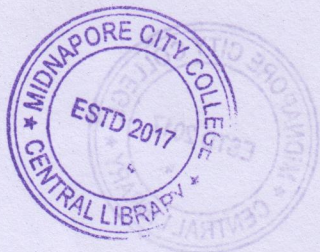
**Use separate Answer Scripts for Group-A & Group-B**

**Group A**  
**(Immunology)**

1. **Answer two questions from the following:** **2×2=4**
  - a) “All immunogens are antigen but some antigens are not immunogens” – Explain.
  - b) Explain Affinity and Avidity.
  - c) What do you mean by sandwich ELISA?
  - d) What are NK cells? Mention their functions.
  
2. **Answer any two of the following questions:** **2×4=8**
  - a) What do you mean by Variolation and Vaccination? Mention any two requirements for immunogenicity. **2+2=4**
  - b) What is Agretope? Write the Principle of immunohistochemistry.
  - c) Distinguish between B-cell epitope and T-cell epitope.
  - d) Illustrate the process opsonization with suitable diagram.
  
3. **Answer any one of the following questions:** **1×8=8**
  - a) Write the principle of southern Blotting Hybridization (SBH). Discuss briefly the steps and application of SBH. **1+5+2=8**
  - b) i) Describe the structure of class II MHC molecule with suitable diagram.  
 ii) Illustrate the cytosolic pathway for processing of antigen. **4+4=8**

(Turn Over)





**Group B**  
**(Methods in Biology)**

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

- a) What is the function of DNA ligase?
- b) What is Phytoremediation?
- c) Mention the applications of DNA finger printing.
- d) What do you mean by 'Eco-RI'?

2. **Answer any two of the following questions:** **2×4=8**

- a) Briefly discuss about identity of restriction enzyme.
- b) Distinguish between shuttle vector and cosmid vector.
- c) What is Cryopreservation? Note down the integration of Cryopreservation of different rural biotechnological tools.
- d) Write about the basic principle of Electrophoresis. Which type of gel you will be used for the separation of protein fragment by gel electrophoresis.

3. **Answer any one of the following questions:** **1×8=8**

- a) What is bioremediation? Highlight the factors responsible for biodegradation. Briefly describe the in situ bioremediation process. How does bioremediation of xenobiotics and hydrocarbons occur? **2+2+2+2=8**
- b) What way you will make a recombinant DNA? Note down on the following. I. Cutting and join of DNA

II. Amplification of genomes

Discuss in step of protocol of the making of c-DNA library. What is expression vector? **2+2+3+1=8**

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