

This question paper contains 4+2 printed pages]

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**M.Sc. (Sem. II) Examination, 2019**

**ZOOLOGY**

**Paper Z-06**

**(Immunology and Biotechnology)**

**Time Allowed : Three Hours**

**Maximum Marks : 70**

**Minimum Pass Marks : 28**

*This question paper will be divided into*

*three sections as under :*

**Section-A**

**Max. Marks-10**

*will carry 10 marks with 01 compulsory question comprising 10 short answer type questions (maximum 20 words answer) taking two questions from each unit. Each question shall be of one mark.*

5775

1

[Contd....

**Section-B**

**Max. Marks-25**

*will carry 10 questions, 02 questions from each unit (answer about in 250 words). Students are instructed to attempt five questions by selecting one question from each unit.*

**Section-C**

**Max. Marks-35**

*will carry 35 marks with five long answer type questions comprising one compulsory question (Question No. 07) of 15 marks and four questions of 10 marks each. Students are instructed to attempt total **three** questions with **one** compulsory question (answer about in 500 words) and any **two** more questions (answer about in 400 words) out of remaining four questions.*

5775

2

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## Section A

1. Answer the following questions very briefly (in 20 words each) :

- (i) Define acquired immunity.
- (ii) What are haptens ?
- (iii) Define complement system with examples.
- (iv) What do you mean by differentiation ?
- (v) Define cell fusion.
- (vi) What do you mean by bioreactors ?
- (vii) What is IVF ?
- (viii) What is hybridoma technology ?
- (ix) What is DNA finger printing ?
- (x) Write two names of micro-organisms used in food biotechnology.  $10 \times 1 = 10$

## Section B

### UNIT-I

2. Explain cells of the immune system and their differentiation. 5

Or

Write notes on :  $2\frac{1}{2} + 2\frac{1}{2} = 5$

- (a) Epitopes
- (b) Factors influencing immunogenicity.

### UNIT-II

3. Write notes on :  $2\frac{1}{2} + 2\frac{1}{2} = 5$

- (a) Activation and differentiation of T-cell and B-cell <https://www.uokononline.com>
- (b) Cell-mediated immunity.

Or

Explain the organization and expression of Ig genes. 5

### UNIT-III

4. Explain the Recombinant DNA technology. 5

Or

Write notes on :  $2\frac{1}{2}+2\frac{1}{2}=5$

- (a) Somatic hybridisation
- (b) Cloning vectors.

### UNIT-IV

5. Describe the techniques of micro-carrier cultures. 5

Or

Write notes on :  $2\frac{1}{2}+2\frac{1}{2}=5$

- (a) IVF
- (b) Cell synchronization.

### UNIT-V

6. Describe the agricultural biotechnology with their importance. 5

Or

Write short notes on :  $2\frac{1}{2}+2\frac{1}{2}=5$

- (a) Gene therapy
- (b) Spheroplasts.

### Section C

- 7. Discuss the antigen-antibody interactions with examples. 15
- 8. Describe the structure and functions of antibodies. 10
- 9. Explain the immunological tolerance and anti-immunity. 10
- 10. Explain the chemical, physical and metabolic functions of different constituents of culture medium. 10
- 11. Discuss the use of microorganism in dairy industry. Write suitable examples. 10