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.*

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.*

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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. 10×1=10

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Section B

UNIT-I

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

Or

Write notes on : 2½+2½=5

(*a*) Epitopes

(*b*) Factors influencing immunogenicity.

UNIT-II

3. Write notes on : 2½+2½=5

(*a*) Activation and differentiation of T-cell and B-cell

(*b*) Cell-mediated immunity.

Or

Explain the organization and expression of Ig genes. 5

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UNIT-III

4. Explain the Recombinant DNA technology. 5

Or

Write notes on : 2½+2½=5

(*a*) Somatic hybridisation

(*b*) Cloning vectors.

UNIT-IV

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

Or

Write notes on : 2½+2½=5

(*a*) IVF

(*b*) Cell synchronization.

UNIT-V

6. Describe the agricultural biotechnology with their importance. 5

Or

Write short notes on : 2½+2½=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

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