RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.SC. FIFTH SEMESTER EXAMINATION, DECEMBER 2013

THIRD YEAR

Date : 21/12/2013 — **Microbiology (Honours)**

Time : 11 am – 1 pm — Paper : V — Full Marks : 50

Group – B

Answer **any two** questions from question **no. 1** :

1. a) i) Design an experiment to prove that viruses can be classified based on site of assembly? $(2\frac{1}{2})$

   ii) Viral lipids are not determined by viruses - justify the statement. (2)

   iii) What prevents pairing of A and u? (2)

   iv) How will you determine whether the viral nucleic acid is DNA or RNA? (1)

   b) i) What is P^{32} suicidal rate? (2)

   ii) Write short note on (any one) :- 1) Terminal redundancy 2) Cyclic permutation. (2)

   iii) What are the important characteristics of bacteriophage λ. $(1\frac{1}{2})$

   iv) Draw a typical viral growth curve. (2)

   c) i) Inhibitor repressor concentration in system is essential for maintaining lytic and lysogenic process in λ –Justify the statement. (3)

   ii) What do you mean by Pac site? (1)

   iii) What are DD mutant? (1)

   iv) What happen when bacteria was infected with λ CII – with normal CIII and λ CIII – with normal CII. $(2\frac{1}{2})$

   d) i) How T_7 viral genome can enter into the host? (2)

   ii) What are the strategies taken by T_4 phage to take over the host machinery? (3)

   iii) What are prions? $(1\frac{1}{2})$

   iv) What do you mean by MOI? (1)

Answer **any two** questions from question **no. 2** :

2. a) i) Define normal flora. Write down its two important functions. $(1\frac{1}{2}+2)$

   ii) What are the roles of normal flora present in the large intestine? (2)

   iii) How do the physiological changes affect normal flora? (2)

   b) i) What is mucociliary escalation? (2)

   ii) What are the differences between endotoxins and exotoxins? (2)

   iii) How does fructose consumption increase the possibility of dental caries? (2)

   iv) What is the role of homoserinelactone in quorum sensing? $(1\frac{1}{2})$

c) i) What do you mean by adhesin? What are the different types of non-flagellar adhesins? $(1\frac{1}{2}+2\frac{1}{2})$

ii) Write down the roles of coagulase in bacterial pathogenicity. $(1\frac{1}{2})$

iii) Distinguish between pathogenicity and virulence. (2)

d) i) What is toxoid? How can it be produced? $(1\frac{1}{2}+1\frac{1}{2})$

ii) Write down the structure and function of botulin. $(1\frac{1}{2}+3)$

Answer **any two** questions from question **no. 3** :

3. a) i) What are Autoantigens? (2)

ii) What are the advantages and disadvantages of using attenuated organisms as vaccines? (4)

iii) What do you mean by professional APCs? (2)

iv) MHC genes are expressed in a codominant fashion – Explain. (2)

b) i) Describe what is meant by Affinity Maturation. (4)

ii) How can a Naive B cell be primed? (4)

iii) What is an immunological synapse? (2)

c) i) Skin epithelia can act as an anatomical barrier – Justify the statement. $(1\frac{1}{2})$

ii) What is opsonization? $(1\frac{1}{2})$

iii) Write a short note on Natural Killer T cells. (2)

iv) Explain the difference between antibody affinity and antibody avidity. Which of these properties of an antibody better reflects its ability to contribute to the humoral immune response to invading bacteria? $(2\frac{1}{2}+2\frac{1}{2})$

d) i) Cite an experiment that proves that surface topology is important to function as a B cell epitope. (2)

ii) An antigen can be better called an immunogen – Justify. (2)

iii) What is adjuvant? Give an example. What are the functions of adjuvant. (1 + 1 + 2)

iv) What are Bence - Jones proteins? (2)