RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SIXTH SEMESTER EXAMINATION, JUNE 2022

THIRD YEAR [BATCH 2019-22]

Date : 20/06/2022

MICROBIOLOGY (HONOURS)

Time : 11 am – 1 pm

Paper : XIII [CC13]

Full Marks : 50

1. Answer **any ten** of the following questions: [10×2]

   a) Differentiate exogenous antigen from endogenous antigen.

   b) What is hematopoiesis? State its importance.

   c) All immunogens are antigen but reverse is not true. Justify the statement.

   d) Illustrate your knowledge on the importance of natural killer cells.

   e) What do you mean by term variability? How will you measure it?

   f) State the biotechnological application of ELISA and western blot.

   g) How does sequential antigen differ from non-sequential antigen?

   h) What is CTL? How is this response developed?

   i) How does agglutination differ from precipitation?

   j) How does monoclonal antibody differ from polyclonal antibody?

   k) What do you mean by "Innocent Bystander Lysis"?

   l) What do you mean by MAC?

   m) What do you mean by Atopy?

   n) What is ELISPOT assay?

   o) What do you mean by Immunoprecipitation?

Answer **any three** of the following questions: [3×10]

2. a) How will you select hybridoma cells during the production of monoclonal antibody?

   b) How does monoclonal antibody differ from polyclonal antibody?

   c) What is epitope?

   d) How does it differ from hapten?

   e) State the importance of adjuvants. (4+1+1+2+2)

3. a) What is Prozon effect?

   b) How does oxygen dependent killing differ from oxygen independent killing?

   c) Differentiate B-cell receptor from T-cell receptor.

   d) How will you know that the immunoglobulin molecules are composed of two different polypeptide chains?

   e) What is PRR and mention its importance.

   f) Explain the difference between antibody affinity and avidity. Which of these properties of an antibody better reflects its ability to contribute to the humoral immune response to invading bacteria? [1+2+2+2+1(1+1)]

4. a) A young girl who had never been immunized to tetanus stepped on a rusty nail and got a deep puncture wound. The doctor cleaned out the wound and gave the child an injection of tetanus antitoxin.

   i) Why was antitoxin given instead of a booster shot of tetanus toxoid?

   ii) If the girl receives no further treatment and steps on a rusty nail again 3 years later, will she be immune to tetanus?

   b) You have identified a bacterial protein antigen that confers protective immunity to a pathogenic bacterium and have cloned the gene that encodes it. The choices are either to express the protein in yeast and use this recombinant protein as a vaccine, or to use the gene for the protein to prepare a DNA vaccine. Which approach would you take and why?

   c) Illustrate your knowledge on hybridoma technology for the production of mAb.

   d) What is ADCC? [(2+2)+2+3+1]

5. a) What is the difference between Immunogenicity and Antigenicity ?

   b) What are RIST and RAST ?

   c) What is a Paratope? [(2+2)+(2+2)+2]

6. a) What do you mean by Erythroblastosis Foetalis ?

   b) Why do blood transfusion process monitored for similar blood group compatibility?

   c) What is RIA? (4+3+3)

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