2021

BIOCHEMISTRY — HONOURS

Sixth Paper

(Module - XI)

Full Marks : 50

The figures in the margin indicate full marks.

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

Answer **question no.** **1** and **any two** taking at least **one** from each of **Unit** **I** and **Unit** **II**

1. Answer **any ten** questions :   10×2

   (a) What are adjuvants? Name one adjuvant used for human.

   (b) What is serum sickness?

   (c) Name two non-professional antigen presenting cell.

   (d) What is the difference between heat killed and attenuated vaccines?

   (e) What are cytokines? — Give example.

   (f) How do you distinguish between immature and mature B cells?

   (g) What is hapten? — Give example.

   (h) 'A single molecule of membrane bound IgM can activate the Clq component of the classical pathway of complement activation.' — Justify the statement.

   (i) What are tumor antigens?

   (j) IgM functions more effectively than IgG in bacterial agglutination. — Explain.

   (k) What is anaphylatoxin? — Give example.

   (1) 'Babies can acquire IgE mediated allergies by passive transfer of maternal antibodies.' — Justify the statement.

   (m) What is meant by the term 'opsonization'? Give example of an opsonin molecule.

   (n) What do you mean by hematopoiesis? Where does it take place?

   (o) All immunogens are antigens but not all antigens are immunogens. — Explain.

Unit - I

2. (a) What are the two primary characteristics that distinguish between hematopoetic stem cells and progenitor cells?

   (b) Differentiate between antigen affinity and avidity.

Please Turn Over

    (c) State the role of S-IgA molecule.

    (d) What are endogenous and exogenous antigens?

    (e) How does antibody affinity differ from antibody avidity?

    (f) Draw a schematic diagram of an IgG molecule and level each of the parts and domain.

    (g) Discuss briefly the role of macrophage in innate immunity. $(2+2+2+2+2+2\frac{1}{2}+2\frac{1}{2})$

3. (a) Explain the difference between monocytes and macrophages.

    (b) If you treat IgG with papain, pepsin and β mercaptoethanol separately what fragments will be produced in each case? Which of the generated fragments will be able to precipitate antigens and why?

    (c) What are the important functions of thymic stromal cells?

    (d) How do natural killer (NK) cells function in antibody dependent cellular cytotoxicity (ADCC)?

    (e) Discuss briefly the role of dendritic cell in immunity.

    (f) What is the effect of removal of the bursa of Fabricius (bursectomy) having on chicken?
$$2+(3+2)+2+2+3+1$$

Unit - II

4. (a) What are the advantages and disadvantages of Sabin polio vaccine compared to Salk vaccine?

    (b) What is delayed type hypersensitivity? — Give an example.

    (c) Schematically demonstrate how will you detect HIV infection in a patient by ELISA technique?

    (d) What is autoimmunity? Name two autoimmune diseases.

    (e) Precipitation tests are generally more sensitive than agglutination tests. — Justify the statement.

    (f) Explain why red blood cells are more prone to complement mediated lysis than nucleated cells.

    (g) Give an example of the bacterial attenuated vaccines. $2\frac{1}{2}+(1+1)+3+(1+2)+1\frac{1}{2}+2+1$

5. (a) Explain why the second child of Rh+ve father and Rh–ve mother is at the risk of hemolytic disease.

    (b) Complement activation can occur via the classical, alternative or lectin pathway. How do the three pathways differ in the substance that can initiate activation? Which portion of the overall activation sequence differs in the three pathways? Which portion is similar?

    (c) Indicate which type of hypersensitivity reactions (I-IV) apply to the following characteristics:

      (i) can lead to symptoms of asthma

     (ii) systemic form of reaction treated with epinephrine.

    (iii) can lead to contact dermatitis

    (iv) involves histamine as an important mediator.

    (d) What is DNA vaccine? Mention at least two advantages of the DNA vaccine.

    (e) Give one example of toxoid vaccine. $2+(1\frac{1}{2}+2+1\frac{1}{2})+(4\times1)+(1+2)+1$

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