

2020

BIOCHEMISTRY — HONOURS

Paper : DSE-A-1

(Nutritional Biochemistry)

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.*

1. Answer **any five** questions : 2×5
- (a) Name the enzyme along with its substrate which can digest polysaccharide in the mouth?
 - (b) Define nutrition.
 - (c) 'Deficiency of biotin occur after long term consumption of raw eggs.' Give biochemical reason.
 - (d) Name two fat soluble and two water soluble vitamins.
 - (e) Why Se is termed as essential micronutrient?
 - (f) What do you understand by the term NPU?
 - (g) Why arsenic is toxic to human?
 - (h) Describe the role of essential fatty acids as bactericidal agents.
 - (i) In what form and where is carbohydrate stored in the body?
 - (j) What is nitrogen balance?
2. Answer **any two** questions :
- (a) Why does odema occur in kwashiorkor? Describe the treatment of kwashiorkor. 2+3
 - (b) What is the biological value of a protein? Define protein calorie malnutrition. 3+2
 - (c) Explain the role of calcium in blood clotting. Write the significance of calcium : phosphorous ratio in diet. 3+2
 - (d) Discuss the roles played by Folic acid and its derivative. 3+2
3. Answer **any three** questions :
- (a) (i) Discuss the sources of essential fatty acids.
 - (ii) What is the relationship between fat consumption and health problems such as heart disease and cancer?
 - (iii) How are fats digested in human body? 3+(2+2)+3

Please Turn Over

- (b) (i) How are monosaccharides absorbed?
(ii) What are the dietary requirement of iodine and iron?
(iii) What is Body Mass Index (BMI)? 3+(2½×2)+2
- (c) (i) Write down the role of Vitamin A in controlling night vision. What will happen in its deficiency?
(ii) Low omega 3 fatty acid intake can lead to thrombosis. — Explain.
(iii) Which foods are to be avoided in low cholesterol diet? (4+1)+3+2
- (d) (i) What is nitrogen balance? Explain its significance.
(ii) Discuss the role of Vitamin E. (2+3)+5
- (e) (i) Cholecalciferol plays a very important role in bone metabolism— comment.
(ii) Discuss the role of Vitamin C as cofactor in amino acid metabolism. 5+5
- (f) (i) What is dietary fibre? How is it different from crude fibre?
(ii) What are the factors that determine basal metabolic rate of an individual? (3+2)+5
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2020

BIOCHEMISTRY — HONOURS

Paper : DSE-A-2

(Molecular Basis of Infectious Diseases)

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.*

1. Answer **any five** questions : 2×5
- (a) Differentiate between antigenic shift and antigenic drift.
 - (b) Name one bacterial and one viral disease that gets transmitted via fecal oral route of disease transmission.
 - (c) Mention the different ways by which infectious diseases get spread.
 - (d) What is meant by zoonotic disease?
 - (e) What is toxoid? Name a disease where toxoid is used as vaccine for its prevention.
 - (f) What is nosocomial infection?
 - (g) What is endospore? Explain with an example.
 - (h) What is antigenic epitope?
 - (i) What is extravasation? — Explain.
 - (j) What is a broad spectrum antibiotic? Give one example.
2. Answer **any two** questions :
- (a) What is meant by vector of a disease? Name one parasitic and one viral disease transmitted by one common vector. Differentiate between endotoxin and exotoxin. (2+1)+2
 - (b) What do you mean by opportunistic pathogen? Give example. Briefly describe Baltimore classification system for viruses. (1+1)+3
 - (c) What is paralytic poliomyelitis? Name one intestinal disease caused by protozoa. What is the causative agent of that disease? How is the disease diagnosed in the laboratory? 2+(1+1+1)
 - (d) Name the five species of protozoa that cause malaria in humans. Which one of these species is responsible for causing malignancy? What is aspergillosis? 2½+1+1½

Please Turn Over

3. (a) What are siderophores?
 (b) Name the vaccine that is administered to prevent tuberculosis. Which bacteria has been employed to develop the vaccine? When is the vaccine usually administered to individuals to prevent the disease?
 (c) Antigenic drift is a major problem in designing vaccines. — Explain.
 (d) What is amoebiasis? How is the disease diagnosed? 2+(1+1+1)+2+(1+2)

Or,

4. (a) How does *Mycobacterium tuberculosis* inhibit phagosome maturation? Discuss briefly.
 (b) Write down the scientific name of vector of chikungunya and leishmania.
 (c) Schematically represent the life cycle of *Plasmodium* in human host.
 (d) Discuss briefly the mode of action of Pertussis toxin. 3+2+2½+2½
5. (a) Being HIV positive does not necessarily mean that person will develop AIDS. — Explain.
 (b) Briefly describe how diphtheria toxin affects translation in human.
 (c) What is meant by portal of entry? What are the various portal of entry for establishment of infection?
 (d) How does Salk Polio Vaccine differ from Sabin Polio Vaccine? 2+3+(1+2)+2

Or,

6. (a) What do you mean by reservoir of infection?
 (b) Briefly describe the various evasion strategies employed by pathogenic bacteria.
 (c) Name the four drugs that are used in DOTS therapy for TB.
 (d) What is Hospital Acquired Pneumonia (HAP)? 2+3+3+2
7. (a) Differentiate between pathogenicity and virulence.
 (b) Mention the diseases against which the combined vaccine DTaP is used.
 (c) Briefly describe the strategies employed by bacteria for evading or surviving host defense mechanism.
 (d) Discuss briefly how does chloroquine inhibit the growth of *Plasmodium* sp.
 (e) What is 'Bacillus Calmette-Guerin' vaccine? 2+1½+2½+3+1

Or,

8. (a) What is lethal dose 50 (LD₅₀)? What is vertical transmission of pathogens?
 (b) What is super antigen? Graphically illustrate the four stages of infectious diseases.
 (c) Why do AIDS patient often die from opportunistic infections?
 (d) How can we restrict the spread of Dengue and Chikungunya? (1+2)+(1+2)+2+2
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