2021

BIOCHEMISTRY — GENERAL

Fourth Paper

(Group - A)

Full Marks : 75

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 four*** taking ***one*** from each ***Unit*** **(I, II, III and IV)**

1. Answer ***any six*** questions : 2½×6

(a) What is oxidative deamination? — Give example.

(b) What is the dark reaction?

(c) What is the clinical significance of LDH?

(d) How do lead and mercury cause toxicity in human?

(e) What is protein efficiency ratio (PER)?

(f) What is wobble hypothesis?

(g) What is suppressor mutation? — Explain.

(h) What is phagocytosis?

(i) What is meant by histocompatibility?

(j) What are Okazaki fragments?

Unit - I

2. (a) What is gluconeogenesis? Write the rate controlling steps of this pathway.

(b) What are ketone bodies? Mention their role in metabolism.

(c) Mention two inhibitors of ETC. Calculate the energy yield of palmitic acid during beta-oxidation. (2+3)+(2+2)+(2+4)

3. (a) What is carnitine shuttle? Explain schematically.

(b) How are electron transport chain and oxidative phosphorylation coupled?

(c) What are glucogenic and ketogenic amino acids? Give one example for each.

(d) Differentiate between oxidative and substrate level phosphorylation.

(e) Briefly describe the regulation of TCA cycle. 3+3+3+3+3

Unit - II

4. (a) What is the clinical significance of the following enzymes?
(i) SGOT
(ii) SGPT
(b) What is CPK? How many isoenzymes are identified? Justify the statement that CPK is useful in clinical diagnosis? (3+3)+(2+2+5)

5. (a) Describe briefly the factors controlling nitrogen balance.
(b) Name two inborn error of amino acid metabolism and explain the causes.
(c) What is BMR? What are the factors affecting BMR?
(d) What is the role of Iodine and Calcium in our body? 3+(2+2)+(2+3)+3

Unit - Ill

6. (a) What is the difference between innate and adaptive immunity?
(b) How do B cells and cytotoxic T cells together fight against an invading pathogen?
(c) Describe the function of adjuvants and give an example.
(d) List the primary lymphoid organs and summarize their functions in immune response.
(e) Justify the statement — 'Hapten is antigenic but not immunogenic'. 3+3+3+4+2

7. (a) What is endogenous antigen? Cite an example.
(b) What is Delayed Type Hypersensitivity?
(c) What are the differences between precipitation reaction and agglutination?
(d) How does the complement system get activated by the alternative pathway?
(e) What is clonal selection theory? (l+l)+2+3+5+3

Unit - IV

8. (a) How do prokaryotic genomes differ from eukaryotic genomes?
(b) What is meant by a 'degenerate' genetic code?
(c) Name all the proteins involved in translational initiation in prokaryotes. Briefly mention their functions.
(d) How the translation process in prokaryote can be regulated?
(e) 'The drug rifampicin inhibit transcription.' — Explain. 3+2+(2+2)+3+3

9. (a) How can you experimentally prove that DNA replication is Bidirectional in prokaryotes?
(b) What is frame shift mutation?
(c) What is Shine Dalgarno sequence?
(d) What is transgenic plant?
(e) What are the different methods of blunt end DNA ligation? 3+3+3+3+3