2008

HUMAN PHYSIOLOGY

PAPER—I

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks

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

Illustrate the answers wherever necessary

UNIT—01

Answer any *two* questions

1. (*a*) What is oxidative phosphorylation ?

   (*b*) Mention the components of Mitochondrial electron transport chain with brief description of their activity.

   (*c*) What do you understand by *Q*-cycle ? How it functions ? 2 + 3 + 5

2. (*a*) Discuss in brief the mechanisms of action of the Thyroid hormone on Carbohydrate Metabolism.

(*b*) How the stabilization of tertiary and quaternary structures of protein molecules are accomplished? 5 + 5

3. (*a*) What is the principle behind the use of ethanol to treat methanol poisoning?

(*b*) An enzyme has a K_m of 8 μm in the absence of a competitive inhibitor and an K_m^{app} of 12 μm in the presence of 3 μm of the inhibitor. Calculate KI.

(*c*) How does the feedback inhibition of ATCase regulate pyrimidine bio-synthesis? 3 + 3 + 4

4. (*a*) What is the significance of glycosylation of a nascent polypeptide?

(*b*) What are 'core' and 'terminal' glycosylation?

(*c*) Elaborate the synthesis of oligosaccharide core of glycoproteins and its transfer to the protein in the endoplasmic reticulum. 2 + 3 + 5

UNIT—02

Answer any *two* questions

1. (*a*) What is codon-anticodon interaction ? What do you mean by degeneracy of codon ? What is Wobble hypothesis ?

(*b*) "Study of protein biosynthesis is energy consuming process." Justify the statement. 2 + 2 + 2 + 4

2. (*a*) What types of RNA processing occurs only in Eukaryotes not in Prokaryotes ?

(*b*) Describe the processing mechanism of rRNA and mRNA. 3 + 7

3. (*a*) What do you mean by oncogene ? What are their types ?

(*b*) Discuss the mechanism of Ras protein for the initiation of cancer. 2 + 2 + 6

4. (*a*) Define replicons. What is nick translation ?

(*b*) Describe the different structural unit present in the DNA polymerase III with their functions.

(*c*) Distinguish the prokaryotic and eukaryotic DNA replication. 1 + 2 + 3 + 4
