PG/IS/H.PHY-101/10

M.Sc. 1st Semester Examination, 2010

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

Write the answer to questions of each Unit in separate books

UNIT—1

Answer any *two* questions

1. (*a*) Describe in brief the components of mitochondrial electron transport chain. State the basic mode of its functioning in oxidative phosphorylation.

(*b*) Name two uncouplers of oxidative phosphorylation. (5 + 3) + 2

2. (*a*) What are Chaperones ?

(*b*) Give a brief account of molecular chaperones in protein folding.

(*c*) Discuss in brief the mechanism of action of thyroid hormones in protein metabolism. 1 + 4 + 5

3. (*a*) State the transition state diagram for the reaction A + B $\rightarrow$ P + Q. What is Gibbs free energy of activation ?

(*b*) Mention the principle of inhibition in using ethanol to treat methanol poisoning.

(*c*) What are 'Eadie-Hofstee' and 'Wolf-Hanes plot' of enzyme kinetics ? (3 + 1) + 2 + (2 + 2)

4. (*a*) Distinguish between 'N-linked' and 'O-linked' glycosylation of protein.

(*b*) How lysosomal protein targeting is accomplished ? What is I-cell disease ?

(*c*) Write a brief note on biosynthesis of Sphingomyelin. (1 + 1) + (3 + 1) + 4

UNIT–2

Answer any *two* questions

1. (*a*) Define hypochromicity, hyperchromicity and Tm.

(*b*) Mention two differences between A, B and Z DNA.

(*c*) Describe the structure and function of *E.coli* DNA polymerase I. 3 + 3 + 4

2. (*a*) What are the types and importance of repetitive sequences ?

(*b*) What is retroviral oncogene ? Describe mutant RAS protein signaling pathway with suitable diagram. 4 +(1 + 5)

3. (*a*) What is capping ? Why does capping needed ?

(*b*) What is the role of transcription factor to initiate transcription.

(*c*) Describe the synthesis of eukaryotic mRNA. 2 + 3 + 5

4. (*a*) How can you prove that– "The ribosome is the site of protein biosynthesis".

(*b*) What is Shine-Dalgarno sequence ? Mention its function.

(*c*) How the eukaryotic protein synthesis differ from prokaryotic protein synthesis ? 4 + 2 + 4