

2022

3rd Semester Examination

ZOOLOGY (Honours)

Paper : C 7-T

(Fundamentals of Biochemistry)

[CBCS]



Full Marks : 40

Time : Two Hours

*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 from following :  $2 \times 5 = 10$

- (a) What is isoelectric pH?
- (b) Name the sugars that are present in DNA and RNA. Which RNA serves as template for protein synthesis?
- (c) What is Z-form of DNA? How does it differ from B-form?
- (d) Name one aromatic amino acid and one positively charged amino acid.
- (e) Name the electron donors of oxidative phosphorylation process.

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- (f) Explain why a single stranded nucleic acid molecule will be more efficient in absorbing UV radiation at 260nm than a double stranded molecule at the same UV wavelength.
- (g) Where does  $\beta$ -oxidation of fatty acids occur? What is ketogenesis?
- (h) What is Chargaff's rule? For a given double stranded molecule write the correct equation from below.

$$\frac{A + T}{G + C} = 1 \quad \square \quad \frac{A + G}{T + C} = 1 \quad \square \quad \frac{A + G}{T + C} \neq 1 \quad \square$$

2. Answer any **four** questions from following :  $5 \times 4 = 20$

- (a) What is gluconeogenesis? Mention the key steps and regulations of gluconeogenesis pathway.  $1 + 4 = 5$
- (b) What is transition state of an enzyme-catalyzed reaction? What is free energy of activation? Name the major forces that reduce the free energy of activation in an enzyme-catalyzed reaction?  $2 + 2 + 1 = 5$
- (c) What is proton motive force? How is this force generated? How is this force used to drive ATP synthesis?  $1 + 2 + 2 = 5$
- (d) Briefly describe the reactions of the investment phase of glycolysis mentioning enzymes involved.

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- (e) Mention and briefly describe different levels of protein structure. What are the structural motifs that play crucial role in shaping secondary structure of proteins?  $4 + 1 = 5$

(f) Write short notes on :

- Allosteric enzymes.

- Feedback inhibition.

$2\frac{1}{2} + 2\frac{1}{2} = 5$

3. Answer any **one** question from following :  $10 \times 1 = 10$

- (a) Why  $\beta$ -oxidation is called so? Briefly describe the steps of  $\beta$ -oxidation process with schematic reactions of each step. How many molecules of ATP can be generated after complete oxidation of palmitic acid?  $1 + 7 + 2 = 10$
- (b) What is urea cycle and where does it occur? Briefly describe the steps of urea cycle with enzymes involved in the step.  $2 + 8 = 10$