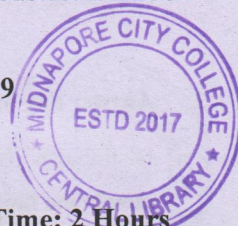


**PG (NEW) CBCS**  
**M.Sc. Semester-II Examination, 2019**  
**ZOOLOGY**  
**PAPER: ZOO-202**  
**(BIOPHYSICS & BIOCHEMISTRY)**

**Full Marks: 40****Time: 2 Hours**

**Use separate Answer-scripts for Group-A & Group-B**

GROUP-A

Biophysics

Marks-20

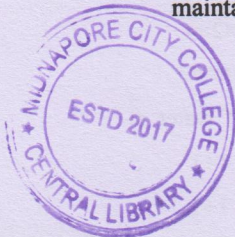
- 1. Answer any two questions of the following: 2×2=4**
- a) How does change of pH affect base-pairing during DNA replication? 1+1
- b) A solution contains 20 g of sucrose (MW = 342) per litre of water at 27°C. Calculate the osmotic pressure of this solution. 1+1
- c) What is Tyndall effect? Why does it occur? 1+1
- d) What, in your opinion, is the most important advantage of Osmium tetroxide in electron microscopic study of cells? What do you mean by an electron-dense part of a cell? 1+1
- 2. Answer any two questions of the following: 2×4=8**
- a) Describe the structural design of an electron gun with illustration? How does it function? 3+1
- b) What do you mean by the internal energy of a system? The latent heat of evaporation of water is 536 cal/g. Calculate  $\Delta H$  and  $\Delta E$  in converting 1 mole of water at 100°C into steam at the same temperature, assuming water to behave as an ideal gas. 1+3
- c) Explain the process of electrodialysis with illustration. Comment on its practical application. 3+1
- d) How does fluorescence microscopy help in the diagnosis of chronic myeloid leukemia? Give an example of metachromatic fluorescence. What do you mean by autofluorescence? 2+1+1

**(Turn over)**



(2)

3. Answer any one question of the following: 1×8=8
- a) Distinguish between flip-flop movement and lateral diffusion of membrane lipids. Explain the significance of 'Fluorescence recovery after photobleaching' in the understanding of fluidity of a biomembrane. What do mean by homeoviscous adaptation of biomembrane? 2+4+2
- b) What is Reynolds's number and what is its significance? Explain the role of hormones in regulation of blood volume. How do baroreceptors maintain homeostasis of blood pressure? 2+3+3



**GROUP-B**  
**Biochemistry**  
**Marks-20**

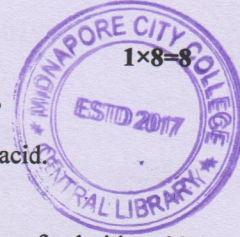
4. Answer any two questions of the following: 2×2=4
- a. What is the role of disulphide bond in protein stability?
- b. State the difference between coenzyme and cofactor.
- c. What do you mean by transamination?
- d. Why is TCA cycle considered to be a 'common metabolic pathway'?
5. Answer any two questions of the following: 2×4=8
- a) Briefly describe the structure of silk protein. How does its conformation differ from that of hair protein? 2+2
- b) What are catecholamines? Briefly describe their biosynthesis. 3+1
- c) Explain the terms: ammonotelism, urcotelism and uricotelism, Define deamination. 3+1
- d) Describe the pathway of gluconeogenesis from pyruvate. 4

(Turn over)



(3)

6. Answer any one question of the following:



- a) i) What do you mean by B-oxidation of fatty acid?  
ii) Briefly describe the process in case of palmitic acid?  
iii) Explain the role of carnitine in B-oxidation.  
iv) How many ATPs are produced from B oxidation of palmitic acid?

1+4+1+2= 8

- b) i) What is Michaelis Menten equation?  
ii) Prove  $k_m - [s]$  when enzymes activity reaches half of its minimum velocity.  
iii) Write the difference between competitive and non-competitive inhibitors.  
iv) What do you mean by the active site of an enzyme?

2+2+3+1=8

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