2022

ZOOLOGY

[P.G.]

(M.Sc. Second Semester End Examination-2022)

PAPER- 202

Full Marks: 40 ***Time: 02 Hrs***

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

Use separate Answer script in each Unit

Group – A Marks 20

Biophysics

1. Answer any two questions from the following: 2x2= 4

a) State the difference between ΔG and ΔG°.

b) Differentiate resolving power and limit of resolution for light microscope. 2

c) State the role of Reynolds numberin maintenance of circulatory rate of body fluids. 2

d) State the role of zeta potential in clotting of blood. 2

2. Answer any two questions from the following: 2x4 = 8

a) Consider the following condition;

$P\ (Protein)+D(Drug) \xrightarrow{K_a} [PD]$

If K_a is the association coefficient, determine the binding efficacy of the designed drug through Isothermal Titration Calorimetry (ITC). What are lipid rafts? 3+1

b) Suppose you were given an active motile microorganism, which of the following types of microscopy would be effective in lively visualization of microbe?

a) Scanning electron microscopy

b) Fluorescence microscopy

c) Dark field microscopy

d) Phase contrast microscopy

Briefly explain Gibbs-Donnan effect 2+2

c) Briefly differentiate the difference in working principle of STEM and AFM microscopy. Suggest a microscopical method to the researcher who is working on vesicular trafficking of different membranal proteins.

d) Briefly explain how the diameter of different types of bloodvessels regulate th dynamics of blood flow? What is Kochler illumination. 2+2

3. Answer any one question of the following: 1x8 = 8

a) Explain the principle of phase contrast microscopy. What will be the concentration of ligand for occupying 20 % of receptors if

Kd for ligand binding to the receptor is 10^{-7} Differentiate magnifying power and magnification of light microscope.

b) Derive the relationship of angular magnification and power lens. Explain Abb's equation in regulating resolving power of lens. How does optical path length vary in light microscopy if refractive index of light in specimen of "t" thickness is thrice the refractive index of light in specimen of "t" thickness is thrice the refractive index of light in air?

Group – B Marks 20

Biochemistry

4. Answer any two questions from the following: 2x2= 4

a) Write the name of new class of enzyme with example and function after 2018.

b) What is isozyme? Write its importance.

c) What do you mean by rate limiting step? Give example.

d) Write the fate of pymrate.

5. Answer any two questions from the following: 2x4 = 8

a) Describe first order and zero order reaction with the help of M.M. equation.

b) What do you mean by covalenthy modulated enzymes with suitable example.

c) Write about the anabolic role of TCA cycle with example.

d) Describe the biochemical reactions of rate limiting step in glycolysin.

6. Answer any one question of the following: **1x8 = 8**

a) Write about the enzyme kinetics of Competitive and non-competitive enzyme inhibition and represent it graphically with the help of L.B. plot. Mention the example and therapeutic uses of Competitive inhibition. 4+4

b) Mention the biochemical reaction of gluconeogenesis from four different substrates. 2x4
