

B.Sc-M.Sc. dual degree (Toxicology) Examination 2023
Department of Medical Elementology & Toxicology
SCHOOL OF CHEMICAL AND LIFE SCIENCES

SEMESTER-V
PAPER TITLE: Drug Discovery
PAPER CODE: BTX-CC15

Maximum Marks: 75

Duration of time: 3 Hrs

Note: please write the roll number at the top the answer sheets. Attempt all questions as instructed.

Q1. Very Short Type Questions

(1 X25)

- A)(V_{max}/K_M) is achieved when all enzyme molecules have bound the substrate and are engaged in catalysis.
- B) The lower the..... (V_{max}/K_M) the higher the affinity of the enzyme for the substrate.
- C) The binding of a ligand to a protein typically triggers a conformational change resulting in the modification of its activity. (True/False)
- D) How many amino acids and peptide bond are present in a dipeptide.
- E) Which type of bonding is responsible for stabilizing the secondary structure of proteins?
- F) Binding of ligands to receptors can be best characterised by using Nernst Equation. (True/False)
- G) Write name of two basic amino acids.
- H) Define Native state of protein
- I) Part of enzyme where catalysis occur is known as
- J) What is SAR?
- K) Optimisation of the lead compound is carried out to attempt to improve the selectivity for the drug target. (True/False)
- L) What is in vitro test?
- M) Phase(0/1/2) clinical trial evaluates the best way to administer a drug, its frequency and dose, the maximum tolerated dose (MTD), and side effects.
- N) Full form of NDA is
- O) What are four main classes of receptors?
- P) Once a ligand dissociation constant (K_d) has been determined it is possible to calculate the ΔG for the binding interaction. (True/False)
- Q) A protein that perceives the arrival of a ligand on the outside of a cell is called.....
- R) The pH at which the net charge on the protein molecule is zero is called.....
- S) What does the equation, $k = Ae^{-\Delta G/RT}$ represent?
- T) Substances which reduce the rate of enzyme catalyzed reactions are known as.....
- U) The alpha helix, beta pleated sheet and beta turns are examples of protein structure.
- V) What is λ_{max} of a UV/Vis spectrum.
- W) What do you understand by difference spectrum?

X) Protein Data Bank (PDB) provides access to

Y) AutoDock Vina is a software used for

2. Short Answer: Attempt any Five out of seven questions

5 X 5

- A. Discuss Receptors as Drug Targets.
- B. Describe Catalytic Constant k_{cat} .
- C. Discuss Factor affecting enzyme kinetics.
- D. What are different roles of proteins in various life processes. What is peptide bond? Draw a peptide bond between two amino acids.
- E. Draw properly labelled Scatcherd and Klotz plots.
- F. Define following terms (i) bioassay (ii) lead compound (iii) Preclinical Research
- G. Write short note on PubChem and PyMol.

3. Long-type Questions. (Attempt any two out of four questions)

2 X 12.5

- A. What is Competitive Inhibition (CI). Write mechanistic diagram for CI and draw the Lineweaver-Burk plot showing effect of inhibition.
 - B. Write Michaelis-Menten Equation. Discuss the meaning and significance of K_M .
 - C. What are different structural level of protein? Discuss each in short.
 - D. What are different stages of drug discovery and development discuss each stage in short.
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