JHARKHAND Rai University
RANCHI
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End Semester / Reappear (Semester V) Examination Dec 2022

Programme: B. Pharm **Full Marks: 75**

Course: Medicinal Chemistry II **Time: 3 Hrs.**

Course Code: BP501T

Enrollment No: _____

Section I

1. **Objective type questions. Answer all questions.** **20x1=20**

i. Amino acids are joined together via which bond?
a. Dipole-Dipole b. Amide c. Hydrogen d. Ionic

ii. Amide Bond Resonance (ABR) in terms of protein structure is an important feature. The N's lone pair is delocalised, having several important ramifications. Select which of these is NOT a ramification.
a. O has a δ- charge and the N has a δ+; the Amide groups can form hydrogen bonds with each other.
b. Amide C-N bond has partial double bonds character, therefore backbone of protein is more rigid.
c. The orientation of atoms –CC(=O)NHC are all in a plane, the cis orientation is more stable than the trans.
d. The orientation of atoms –CC(=O)NHC are all in a plane, the trans orientation is more stable than the cis.

iii. Hydrogen bonding is an essential bond type for the backbone of proteins. Which fact about hydrogen bonding is FALSE?
a. Amide bonds aren't good at forming hydrogen bonds b. Much weaker than chemical bonds
c. Vital for controlling the shape of a protein d. Forms H δ+ with X δ- (X = N,O, S)

iv. The amino acid has little to no influence on protein structure:
a. Gly, G b. Val, V c. Asp, D d. Pro, P

v. Amino acids form from:
a. N terminus to C terminus b. C terminus to C terminus
c. C terminus to N terminus d. N terminus to N terminus

vi. Genetic diseases e.g cystic fibrosis often occur in:
a. Dipeptide mutations b. Polypeptide mutations
c. Tripeptide mutations d. Single amino acid mutation

vii. Different sequences can be compared by a sequence alignment. Which statement is true in this case?
a. Sequences that can be aligned are called homologous
b. Sequences that can be aligned are called heterologous
c. Sequences that can be aligned are called analogous d. Neither of the above

viii. The protein secondary structure has four elements:
a. Random coil, turns, α-sheets and β-helix b. Random coil, rotations, γ-sheets and α-helix
c. Random coil, turns, β-sheets and α-helix d. Specific coil, turns, β-sheets and α-helix

ix. Which elements of the secondary protein structure includes hydrogen bonding?
a. α-helix and Random coil b. Random coil and β- turns
c. α-helix and β-turns d. B-sheets and α-helix

x. The equilibrium in tertiary proteins are a sum of many small effects, which are:
a. Steric repulsions, H-bonds and Ionic bonds
b. H-bonds, covalent bonds and Steric repulsions
c. Dipole-dipole, Vander Walls interactions and H-bonds

xi. What is an enzyme?
a. A protein that acts as a catalyst for a reaction
b. A molecule which binds to a receptor without activating it
c. A molecule that produces the same response at a receptor as the natural messenger
d. Organic molecules acting as cofactors

xii. What's a catalyst
a. A protein that increases the rate of reaction, without altering itself
b. A biological chemical that speeds up a reaction, without altering itself
c. Any chemical that speeds up a reaction, without altering itself
d. None of the above

xiii. Finish the sentence: Catalyst change the reaction _____ by providing a faster reaction process:
a. Kinetics b. Activation c. Pathway d. Neither of the above

xiv. Which catalyst is present to convert cis amides to trans amides?
a. Trans-cis isomerase b. Amide isomerase c. Cis-trans ismoerase d. Neither of the above

xv. Outline the CORRECT residues that disrupt the α-helix:
a. Proline and Glycine b. Tryptophan and Glutamine
c. Valine and Serine d. Arginine and Lysine

xvi. Which arrangement in the β-sheet is prefered?
a. Parallel b. Antiparallel c. Criss-cross d. Random

xvii. Outline the CORRECT residue that does NOT disrupt the β-sheet:
a. Steric repulsions b. Charged residues
c. Amino acids that can't form H-bonds d. Electronic repulsions

xviii. Give another name for tertiary protein structure:
a. The Turn b. The Flip c. The Fold d. The Rotate

xix. Tertiary proteins are in:
a. Negatively charged form b. Neutral c. Equilibrium d. Positively charged form

xx. Outline the CORRECT statement:
a. The catalyst only changes the activation energy (Ea)
b. There is a change in the overall reaction energy
c. All chemical reactions are in equilibrium
d. A catalyst gets there faster by changing the equilibrium

Section II

2. **Short Answer type questions. Answer any five.** **5x7=35**

a. Write down the synthesis of Diphen hydramine hydrochloride & its mechanism of action
b. Give the synthesis of promethazine hydrochloride & its mechanism of action
c. Write down the synthesis of isosorbide dinitrite and mention its use
d. Explain the synthesis of chlorthiazides with their mechanism of action
e. Define Anti arrhythmic drugs. write down the synthesis of Disopyramide phosphate
f. Define and classify the antithyroid drugs with example and their chemical structure.
g. Briefly discuss the synthesis of tolbutamide with their uses

Section III

Long Answer type questions. Answer any two. **2x10= 20**

3. Write down the chemical classification of antihistaminic agents with examples. Explain the synthesis of triprolidine hydrochloride.
4. Write a detail note on I3 and I4 synthesis and its secretion. Describe the structure and mechanism of action of L-thyronine & L-thyroxine
5. Explain the SAR of local anaesthetics and also discuss the mechanism of action of localanaesthetics.

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