Time: 3 Hours **Marks: 75**

Q. 1 Attempt all multiple-choice questions (MCQ) **20M**

Sr No	Questions		Options
1	The first step after a target has been identified is to _____ it	**a**	Optimize
		b	Validate
		c	Process
		d	Rectify
2	Once a target has reached an acceptable level of validation and disease linkage, the project moves into the _____	**a**	Lead identification phase.
		b	IND filng
		c	Efficacy studies
		d	Safety studies
3	Target identification with proteomics is performed by comparing the protein expression levels in _____	**a**	Normal and diseased tissues
		b	Normal and standard tissues
		c	Tissues from different organs of normal person
		d	Tissues from different organs of diseased person
4	Antisense-oligonucleotides usually consist of 15–20 nucleotides, which are complementary to their target _____	**a**	Receptor
		b	mRNA
		c	Enzyme
		d	Protein
5	The siRNA-induced post transcriptional gene silencing starts with the assembly of the _____	**a**	RNA-induced silencing complex
		b	DNA-induced silencing complex
		c	RNA-linked silencing cascade
		d	DNA-linked silencing cascade

6	Which of the following statements best describes a lead compound?	**a**	A compound that contains the element lead.
		b	A compound from the research laboratory that is chosen to go forward for preclinical and clinical trials.
		c	A molecule that shows some activity for the property of interest and serves as the starting point for the development of a drug.
		d	The first compound of a structural class of compounds to reach the market.
7	Lipinski's rule of five is used for	**a**	Docking
		b	Similarity search
		c	Drug likeness
		d	Dynamics simulation
8	Which of the following approach is considered under the 'structure-based drug designing' ?	**a**	Molecular docking
		b	Pharmacophore modeling
		c	QSAR Modeling
		d	Combinatorial synthesis
9	What is meant by docking?	**a**	The process by which two different structures are compared by molecular modeling
		b	The process by which a lead compound is simplified by removing excess functional groups
		c	The process by which drugs are fitted into their target binding sites using molecular modeling.
		d	The process by which a pharmacophore is identified.
10	The first step of rational drug design is to	**a**	Identify the target molecule
		b	Characterize the shape of the target molecule
		c	Design a drug for the target molecule
		d	Test the drug molecule

11	What does the symbol P represents in a QSAR equation?	**a**	pH
		b	Plasma Concentration
		c	Partition coefficient
		d	Prodrug
12	Which of the following statement is true in de novo drug design?	**a**	The design of rigid molecules is superior to flexible ones.
		b	Molecules should be designed to fit as snugly as possible into the target binding site.
		c	Molecules that have to adopt an unstable conformation in order to bind should be rejected.
		d	Desolation energies can be ignored since they are likely to be the same for different molecules having the same pharmacophore.
13	Which of the following statement is untrue when comparing 3D QSAR with conventional QSAR?	**a**	Only drugs of the same structural class should be studied by 3D QSAR or QSAR.
		b	3D QSAR has a predictive quality unlike QSAR.
		c	Experimental parameters are not required by 3D QSAR, but are for QSAR.
		d	Results can be shown graphically in 3D QSAR, but not with QSAR.
14	What is meant by de novo drug design?	**a**	The synthesis of a compound from simple starting materials.
		b	The design of the synthesis required to generate a novel range of structures.
		c	The design of a novel drug based on molecular modeling studies of a binding site.
		d	The modification of a drug based on molecular modeling studies into how it binds to its target binding site.

15	In case of Protein-ligand docking, _____ ligands are often _____ in adapting their shape to fit the receptor binding pocket.	**a**	small molecule, highly flexible
		b	large molecule, highly flexible
		c	large molecule, more flexible
		d	small molecule, less flexible
16	What is advantage of Levodopa over Dopamine	**a**	Improved Membrane permeability
		b	Reduction in production cost
		c	Improved taste
		d	No odour
17	Which of the following is a prodrug	**a**	Neostigmine
		b	Enalapril
		c	Esmolol
		d	Captopril
18	Methenamine is a prodrug of —--	**a**	Mechlorethamine
		b	Metoprolol
		c	Formaldehyde
		d	Mannitol
19	Which of the following will be the pharmacokinetic application of prodrugs?	**a**	Improvement of taste
		b	Improvement of odour
		c	Site-specific drug delivery
		d	Reduction in GI irritation
20	Which of the following is an example of a mutual prodrug?	**a**	Prontosil is the prodrug for sulfanamide
		b	Aspirin is the prodrug of salicylic acid
		c	Benorylate prodrug for NSAIDs and paracetamol
		d	Diesters pro-prodrug for pilocarpic acid

Q 2. Attempt any Two questions **20 M**

1. Define homology modeling. Discuss in detail the process of homology modeling.
2. Discuss and elaborate 'Pharmacophore Modeling' and how it serves as a tool for novel drug discovery.
3. Give a detailed account on De Novo drug design.

Q 3. Attempt any Seven questions **35 M**

1. Discuss process of target identification in new drug discovery
2. Elaborate on history and Development of QSAR.
3. What is QSAR? Give advantages and disadvantages of QSAR?
4. Explain hierarchy of protein.
5. Discuss domains, motifs, and folds in Protein Structure?
6. Explain in detail structure based and ligand-based drug design.
7. Elaborate on methods followed in traditional drug Design.
8. Write about the advantages and disadvantages of prodrug design
9. Elaborate on computational prediction of protein structure.

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