

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All** questions carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

**Q.1 a. Answer the following objective questions as directed: (Any Six) 06**

1. Define ' $ED_{50}$ '.
2. What is a 'partial agonist'?
3. Fill in the blank:  
\_\_\_\_\_ shape is a characteristic of most drug-response curves when plotted on log scale.
4. Fill in the blank:  
A drug is safer if it has \_\_\_\_\_ (lower/higher) therapeutic index.
5. Name the term:  
The antagonism which involves a direct interaction between the agonist and antagonist to inactivate the agonist.
6. Give the term used for:  
A comparative measure for drugs based the minimum quantity of a drug required to produce a given response.
7. State True or False:  
Reversible competitive antagonism is also termed as equilibrium competitive antagonism.
8. State True or False:  
Drug intrinsic activity is equivalent to drug affinity.
9. Give one example of second messenger.

**Q.1 b. Explain the following questions: (Any Two) 14**

1. Role of second messenger system in biological response to drugs.
2. 'Therapeutic index' and illustrate how is it measured?
3. Pharmacological concept of 'drug antagonism' with suitable examples.

**Q.2 a. Do as directed: (Any six) 06**

1. State True or False:  
Intramuscular and subcutaneous routes include an increased reliability and precision in the drug blood level finally achieved and reasonably rapid absorption and onset of drug action.

2. State True or False:  
The total volume of the fluid compartments of the body into which drugs may be distributed is approximately 40 L in a 70 Kg adult.
3. Give one disadvantage of intravenous drug administration.
4. What is lipid- water partition coefficient?
5. Give any one use of rectal drug administration.
6. Give any one transport protein expressed in placenta and act as a placental barrier.
7. Give one example of pathological factor for increased gastric emptying rate.
8. Fill in the blank:  
\_\_\_\_\_acts as a barrier in drug penetration of the skin (Stratum corneum, Stratum spinosum, Stratum granulosum).
9. Fill in the blank:  
The surface are of the pulmonary alveolar membranes is \_\_\_\_\_.  
(50- 100 m<sup>2</sup>, 120- 150 m<sup>2</sup>, 100- 200 m<sup>2</sup>)

**Q.2 b. Discuss the following questions: (Any Two) 14**

1. Absorption of drugs in oral cavity and small intestine.
2. Role of plasma binding proteins in drug absorption.
3. With reference to physiological barriers
  - a. Blood brain barrier.
  - b. Blood- testis barrier.

**Q.3 a. Do as instructed: (Any Six) 06**

1. What is toxicology?
2. What is alcoholism?
3. Give one example of drug used during interrogation.
4. Where is heroine obtained from?
5. Name any one main category of toxicology.
6. What is the role of the consumer product safety commission?
7. LSD stands for \_\_\_\_\_.
8. State True or False:  
The Food and Drug Administration (FDA) is responsible for allowing drugs, cosmetics, and food additives to be sold in the market according to the Federal Food, Drug and Cosmetic Act (FDCA).
9. State True or False:  
Thalidomide is a safe drug during pregnancy.

**Q.3 b. Answer the following questions: (Any Two) 14**

1. Enlist any seven principle clinical manifestation of allergic reactions.
2. Discuss the adverse effects of drugs on reproduction.
3. What is drug abuse? Discuss with any one example.

**Q.4 a. Attempt the following objective questions as instructed: (Any Six) 06**

1. What is Neuromuscular junction?
2. Define Boutons.
3. Name any one anesthetics.
4. Define Synaptic cleft.
5. What is Action potential?
6. Write any one function associated with midbrain.
7. Name any one effect of scorpion toxin on Na<sup>+</sup> channels.
8. Name any one neuroinhibitor in spinal cord and brainstem.
9. Name the one hexameric protein, which forms gap junction.

**Q.4 b. Answer the following questions: (Any Two) 14**

1. Explain in detail about synapses and its types.
2. Diagrammatically explain the organization of brain.
3. Briefly explain neuronal excitation.

**Q.5 Write Short notes on the following: (Any four) 20**

- a. Chemistry of drug–receptor binding.
- b. Metabolism and efflux transporters affecting rate of gastro-intestinal absorption.
- c. Factors influencing drug distribution.
- d. Neurotoxins.
- e. Methanol poisoning.
- f. GABA.