

Duration: 3 hours

Total marks: 75

- N.B. : 1. All questions are compulsory**
2. Figures to right indicate full marks

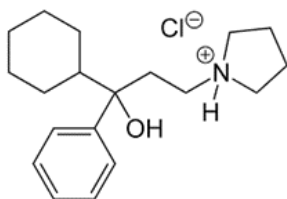
Q. 1 Choose the appropriate option for following multiple choice-based questions. (20)

Each question carries one mark.

- 1 Which of the following statement is incorrect with respect to ionisation of drug
 - [a] The ionization of the drug depends on its pKa & the surrounding pH
 - [b] Ionized form is the preferred form of the drug to cross cell membranes.
 - [c] Most of the drugs are either weak acids or base and can exist in either ionised or unionised state.
 - [d] Ionization imparts good water solubility to drug
- 2 Oxazepam is the active metabolite of which of the following pairs of drugs
 - [a] Chlordiazepoxide and Chlorazepate
 - [b] Chlordiazepoxide and Diazepam
 - [c] Chlordiazepoxide and Alprazolam
 - [d] Chlordiazepoxide and Lorazepam
- 3 When the acetyl group in Acetylcholine is replaced by higher homologs _____.
 - [a] Potency decreases
 - [b] Activity retains
 - [c] No effect on the activity
 - [d] Potency increases
- 4 Which of the following is an example of dissociative anaesthetics
 - [a] Sevoflurane
 - [b] Ketamine HCl
 - [c] Isoflurane
 - [d] Desflurane
- 5 Which of the following is not an examples of 2-arylimidazoline class?
 - [a] Phenylephrine
 - [b] Naphazoline
 - [c] Oxymetazoline
 - [d] Xylometazoline
- 6 Droperidol is a member of ---- class of antipsychotic agents.
 - [a] Phenothiazine
 - [b] Butyrophenone
 - [c] Benzazepine
 - [d] Benzoisoxazole
- 7 Primary site for Drug Metabolism is
 - [a] Intestine
 - [b] Lung
 - [c] Liver
 - [d] Both a and b

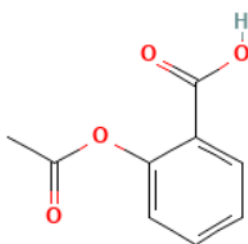
- 8 Mephenytoin acts as an anticonvulsant by
 [a] inhibiting calcium channels
 [b] inhibiting sodium channels
 [c] inhibiting GABA metabolism
 [d] increasing GABA reuptake
- 9 Identify the opioid agonist containing 4-methylpiperidine pharmacophore
 [a] Meperidine
 [b] pentazocine
 [c] Levorphanol
 [d] Codeine
- 10 Ibuprofen is marketed as a racemic mixture, although biologic activity resides almost exclusively in the _____ isomer
 [a] S-(+)
 [b] R-(+)
 [c] S-(-)
 [d] Both R & S

- 11 What is the category of the following drug?



- [a] Parasympathomimetic
 [b] Anticholinergic
 [c] Adrenergic agonist
 [d] Adrenergic blocker

- 12 Identify the drug



- [a] Aspirin
 [b] Diclofenac
 [c] Ibuprofen
 [d] Sulindac

- 13 Which of the following is pure antagonist at all opioid receptor subtype
 [a] Morphine
 [b] Pentazocine
 [c] Naloxone
 [d] Nalorphine

- 14 Identify the drug used to reverse opioids overdose
 [a] Fentanyl
 [b] Loperamide
 [c] Nalorphine
 [d] Morphine
- 15 The longest duration of action of the following benzodiazepines
 [a] Chlordiazepoxide
 [b] Diazepam
 [c] Oxazepam
 [d] Lorazepam
- 16 Uncharged form of which drug exists as a pair of tautomers?
 [a] Methyldopa
 [b] Terbutaline
 [c] Isoproterenol
 [d] Clonidine
- 17 Which of the following is incorrect pair of NSAIDs
 [a] Indole acetic acid: Diclofenac
 [b] Pyrazoles and Pyrazolidinediones: Phenylbutazone
 [c] p-aminophenols: Acetaminophen
 [d] Salicylates: Aspirin
- 18 Select the benzisoxazole and piperidine containing drug from the following.
 [a] Risperidone
 [b] Loxapine
 [c] Clozapine
 [d] Sulpiride
- 19 Which of the following is incorrect statement about Codeine
 [a] Codeine is not a prodrug
 [b] Codeine is the 3-methoxy analogue of Morphine
 [c] Codeine is converted to morphine by the action of CYP enzymes.
 [d] Use of Codeine longer than 6 months is associated with an increased risk of severe cardiovascular events.
- 20 Which of the following anti-inflammatory agents is a prodrug
 [a] Morphine
 [b] Sulindac
 [c] Ibuprofen
 [d] Naproxen

Q.2 Answer **any two** of the following three questions.

(20)

A (i) Discuss importance of ionization and solubility with respect to biological action of drug with example

(4)

(ii) Predict any two Phase-I metabolites and Phase 2 metabolites for each of the following (Draw structures): Propranolol and Chlorpromazine.

(6)

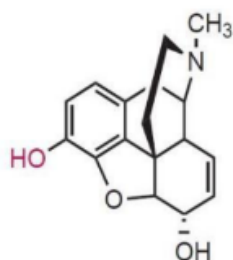
- B (i) Discuss the SAR of anticholinergic agents with suitable examples. (5)
- (ii) Give structure, mechanism of action and uses of Dicyclomine. Outline its synthesis along with reaction conditions and necessary reagents. (5)
- C (i) Discuss SAR of morphine analogues with suitable example (structures necessary) (6)
- (ii) Give structure and metabolism of Halothane and Ketamine hydrochloride (4)

Q.3 Answer **any seven** of the following nine questions. (35)

- A Classify β -adrenergic agonist based on selectivity with suitable examples (including structures). Explain why Salbutamol is orally active. (5)
- B Match the anticonvulsant drugs with their mechanisms of action (5)

	Drug		Anticonvulsant mechanism
1.	Phenytoin	a.	GABA receptor agonist
2.	Clonazepam	b.	increases GABA biosynthesis
3.	Trimethadone	c.	Na channel inhibitor
4.	Felbamate	d.	T-type Calcium channel inhibitor
5.	Gabapentin	e.	NMDA receptor antagonist

- C The list of antimuscarinic agents is given below. Draw their structures and write the chemical class they belong to. Cyclopentolate, Tropicamide, Bzotropine, Biperiden hydrochloride and Dicyclomine. (5)
- D Answer the following with respect to the structure given below: (5)



- i. Identify the structure
- ii. Predict any one Phase I and Phase II metabolite of the structure.
- iii. Give name and structure of 3 methoxy analogue of given structure

iv. Indicate the types of substitution at 17th position that give rise to pure opioid antagonists

- E Explain MAO pathway and COMT pathway in metabolism of Norepinephrine and Epinephrine. (5)
- F Give chemical classification of NSAIDs. (5)
- G Depict the synthesis of Chlorpromazine indicating the reagents and reaction conditions used. Give an example of a thioxanthene bioisostere of Chlorpromazine. (5)
- H Enlist Phase I metabolic reactions and discuss in detail oxidation reactions with suitable examples (5)
- I Name the antidote used for organophosphate poisoning. Draw its structure and discuss the mechanism of action. (5)
