5. Discuss the role of partition coefficient and hydrogen bonding to biological action. 5

6. Classify general anesthetics. Write the synthesis and use of ketamine hydrochloride. 2+3=5

7. Illustrate the significance of bioisosterism in drug action with suitable examples. 5

8. Write a brief note on ultra-short-acting barbiturates as general anesthetics. 5

9. Classify morphine analogues and discuss their structure-activity relationships. 1+4=5

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UG (CBCS) EVEN SEMESTER EXAM, JULY 2024

PHARMACEUTICAL SCIENCES

(4th Semester)

Course No: BP - 402T

(Medicinal Chemistry I-Theory)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

I.A Multiple-choice questions 1x10=10

1. Which of the following give adrenergic blocking action by formation of aziridinium ion

   a. Tolazoline b. Phenoxybenzamine

   c. Propranolol d. Prazocin

2. How many carbon chains are essential for the activity of propranolol

   a. 1 carbon chain b. 2 carbon chain

   c. 3 carbon chain d. 4 carbon chain

3. Yohimbine is a selective

   a. Alpha 2 agonist b. Alpha 2 antagonist

   c. Alpha 1 agonist d. Alpha 1 antagonist

4. In ethylene bridge of acetylcholine incorporation of beta substitution leads to reduction of

   a. Muscarinic activity b. Nicotinic activity

   C. No Change d. All of these above

5. Epoxy ring is present in
   a. Hyosciamine b. Scopolamine
   c. Ipratropium d. Atropine
6. Ephedrine contains
   a. One asymmetric carbon atom
   b. Two asymmetric carbon atoms
   c. Three asymmetric carbon atoms
   d. No asymmetric carbon atom
7. Which of the following compounds exhibit both optical and geometric isomerism?
   a. 2-Bromobutane b. 2-Bromobut-2-ene
   c. 2-Bromobut-1-ene d. 2-Bromobut-2-yne
8. Which dissociative anaesthetic contains a cyclohexanone ring in its chemical structure?
   a. Methoxyflurane b. Ketamine hydrochloride
   c. Sevoflurane d. Isoflurane
9. Which narcotic analgesic contains a piperidine ring in its chemical structure?
   a. Morphine sulphate b. Fentanyl citrate
   c. Meperidine hydrochloride
   d. Methadone hydrochloride
10. Which of the following structural modifications can increase the potency of opioid analgesics?
    a. Adding a hydroxyl group at the C14 position of morphine
    b. Replacing the hydroxyl group at the C3 position with a methoxy group
    c. Removing the N-methyl group from the nitrogen atom
    d. Adding a double bond between C6 and C7

I. B. Objective type 2x5=10

1. Write the structure and chemical name of the following: Salbutamol, propranolol dicyclomine, Methoxyflurane, Acetaminophen

II. Long answers (Answer two out of three questions) 10x2=20

1. Define and classify cholinergic drugs. Write the SAR of parasympathomimetic agent. Outline the preparation of carbachol. 1+2+4+3=10
2. What do you mean by sympathomimetic drugs? Write the SAR of phenyl ethanolamine derivative as sympathomimetic drugs. Outline the synthetic scheme of tolazoline. 1+5+4=10
3. Discuss the classification of NSAIDs including the structures and chemical name of the drugs from each class. Write the SAR of Salicylates. Outline the synthetic route for preparation of ibuprofen. 4+3+3=10

III. Short answers (Answer seven out of nine questions) 5x7=35

1. Define adrenergic blockers. Highlight two examples non-selective alpha-adrenergic blockers with structures. 2+3=5
2. Write notes on biosynthetic pathway of noradrenaline and adrenaline. 5
3. Outline the synthetic scheme for the preparation of Dicyclomine and neostigmine. 2.5x2=5
4. Write the SAR of cholinergic blocking agent. 5