

Question Paper

Exam Date & Time: 14-May-2024 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Medicinal Chemistry I (Theory) [PCH-BP402T-S3]

Marks: 75

Duration: 180 mins.

I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

- 1) Pronethalol is (1)
- [An Alpha-adrenergic blocker](#)
 - [An Aryl ethanolamine derivative](#)
 - [An aryl propanolamine derivative](#)
 - [An aryloxy propanolamine derivative](#)
- 2) Metoprolol has the following substitution on aromatic ring para to oxy propanolamine group (1)
- [Ethyl](#)
 - [Ethoxy methyl](#)
 - [Methoxyethyl](#)
 - [Oxy Methyl](#)
- 3) The following class of drugs show Keto-enol tautomerism (1)
- [Hydantoins](#)
 - [Oxazolidine diones](#)
 - [Succinimides](#)
 - [Barbiturates](#)
- 4) Bucherer-Berg synthesis involves reaction between (1)
- [A ketone and Potassium cyanide](#)
 - [A ketone and Potassium cyanide and Ammonium carbonate](#)
 - [A ketone and Ammonium carbonate](#)
 - [A diketone and Potassium cyanide and Ammonium carbonate](#)
- 5) Uracil is an example of (1)
- [Divalent isosteric replacement](#)
 - [Polar isosteric replacement](#)
 - [Isosteric replacement for longer duration of action](#)
 - [Monovalent isosteric replacement](#)
- 6) P-hydroxy benzoic acid is not antibacterial agent compared to salicylic acid because (1)
- [P-hydroxy benzoic acid is less soluble in water](#)

[P-hydroxy benzoic acid toxic in nature](#)
[Salicylic acid is available in more pure form](#)
[Salicylic acid is less soluble in water and so more partitioning into bacterial cell](#)

7) Barbitol is synthesized by condensing (1)

[Diethyl-2,2-dimethyl malonate with Urea in Anhydrous condition](#)
[Diethyl-2,2-diethyl malonate with Urea in presence of Sodium ethoxide](#)
[Diethyl-2,2-diethyl malonate with benzil in presence of Sodium ethoxide](#)
[Diethyl-2,2-dimethyl malonate with Benzil in Anhydrous condition](#)

8) Methyl substituted Phenobarbital is (1)

[Metharbital](#)
[Methyl pentobarbital](#)
[Amobarbital](#)
[Mephobarbital](#)

9) In the SAR of Barbiturates, replacement of Oxygen between two Nitrogen by Sulfur Result in (1)

[Compounds with longer duration of action](#)
[Diminishes activity](#)
[Increased activity](#)
[Compounds with faster onset and ultra-short duration](#)

10) Which of the feature is not characteristic in Benzodiazepine class of sedatives and hypnotics (1)

[3-Carboxylate](#)
[5-Phenyl group](#)
[1,4-Benzodiazepine](#)
[7-Chlor group](#)

11) Drug metabolism primarily aims to: (1)

[Increase drug potency](#)
[Decrease drug half-life](#)
[Increase drug half-life](#)
[Decrease drug toxicity](#)

12) Which of the following is an anticholinergic drug used to counteract the effects of cholinergic toxicity? (1)

[Atropine](#)
[Neostigmine](#)
[Bethanechol](#)
[Rivastigmine](#)

13) Which of the following cholinergic drugs is commonly used to treat myasthenia gravis? (1)

[Pilocarpine](#)
[Pyridostigmine](#)
[Scopolamine](#)
[Glycopyrrolate](#)

14) Which of the following anticholinergic drugs is commonly used to treat motion sickness and nausea? (1)

[Atropine](#)
[Glycopyrrolate](#)
[Scopolamine](#)
[Clinidium Bromide](#)

15) Which of the following mechanisms contributes to the analgesic effects of nitrous oxide? (1)

[NMDA receptor antagonism](#)
[Opioid receptor activation](#)
[GABA-A receptor modulation](#)
[Norepinephrine reuptake inhibition](#)

16) Which of the following intravenous general anesthetic is called milk of amnesia? (1)

[Ketamine](#)
[Propofol](#)
[Midazolam](#)
[Thiopental](#)

17) What is the antidote for an overdose of opioid analgesics? (1)

[Flumazenil](#)
[Naloxone](#)
[Atropine](#)
[Physostigmine](#)

18) Which of the following narcotic analgesics is a synthetic opioid with a structure distinct from morphine? (1)

[Codeine](#)
[Oxycodone](#)
[Fentanyl](#)
[Hydromorphone](#)

19) Ibuprofen, Ketorolac and Naproxen belong to which class of NSAIDs? (1)

[Selective COX-2 inhibitors](#)
[Acetic acid derivatives](#)
[Salicylates](#)
[Propionic acid derivatives](#)

20) Which NSAID is known for its irreversible inhibition of COX enzymes due to acetylation of a serine residue in the active site? (1)

[Ibuprofen](#)
[Naproxen](#)
[Aspirin](#)
[Celecoxib](#)

II Long Answers

Answer all the questions.

1) Write in detail the effect of inducers and inhibitors on drug metabolism. (5)

A)

B) Classify Cholinomimetics and Cholinolytics drugs with one example and its structure under each class. (5)

- 2) Explain the SAR of Cholinergic blockers with examples and their chemical structures. (5)
- A)
- B) What is dissociative anesthesia? Give examples of drugs exhibiting this phenomena. Outline the synthesis of Methohexital Na. (5)

III Short Answers

Answer all the questions.

- 1) Explain the Chemistry and SAR of Morphine with respect to modifications done at hydroxy group, the unsaturation, the substitution at nitrogen and ring D. (5)
- 2) Explain the common structural features of NSAIDs or Cox inhibitors. Outline the synthesis of Fentanyl Na and mention its use. (5)
- 3) Give examples for optical isomerism and geometrical isomerism in drugs and explain their effect on ADME of drugs. 5M (5)
- 4) How do you synthesize propranolol? Explain the SAR of Aryloxy propanolamines as beta blockers. 2+3 (5)
- 5) Give the chemical classification of antipsychotic agents. Draw the structure of Chlorprothixene and Molindone 3+2 (5)
- 6) Explain the SAR of Anticonvulsants. How do you synthesize Carbamazepine? 3+2 (5)
- 7) With the help of a schematic diagram, illustrate the chemical interactions that happens between catecholamine and adrenergic receptor. Write the structure and mechanism of action of Xylometazoline 3+2 (5)

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