

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END-SEMESTER EXAMINATION)

CLASS: PHARMACY  
BRANCH: PHARMACY

SEMESTER: IV  
SESSION: SP/2019

SUBJECT: BP402T MEDICINAL CHEMISTRY I

TIME: 3.00 Hours

FULL MARK: 75

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
2. Before attempting the question paper, be sure that you have got the correct question paper.
3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
4. This question paper consists of (03) three parts. Read the part wise instructions before attempting the questions.

PART-I

Objective types questions (Instruction: Answer all questions)

Q1.

(4 x 5 = 20 Marks)

A. Fill in the blanks

- (i) Root of ..... used since ancient times for the treatment of dysentery in Brazil
- (ii) Type of adrenergic receptors found in cardiac muscle is .....
- (iii) Torsion angle between quaternary nitrogen and ester oxygen in anticlinal conformation of acetylcholine is .....
- (iv) ..... is a benzodiazepine with anticonvulsant activity.
- (v) Inhalational anaesthetic ..... has good skeletal muscle relaxant property

B. State True or False

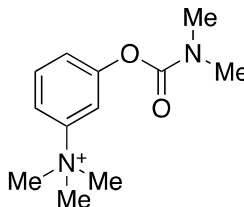
- (i) First pharmacopoeia has the monograph of Ephedrine
- (ii) Nor-epinephrine is biosynthesised from tryptophan
- (iii) Carbachol is slowly hydrolysed by acetyl cholinesterase
- (iv) Sodium valproate acts as anticonvulsant by inhibiting Na-channel
- (v) Aspirin is an ester of acetic acid.

C. Match the following (Single answer)

- |   |                                |
|---|--------------------------------|
| (i) Diethyl stilbesterol                              | (a) Cholinesterase reactivator |
| (ii) Selective Beta-1 blocker with shortest half-life | (b) Ketamine (v)               |
| (iii) Pralidoxime                                     | (c) Thiopental sodium          |
| (iv) Ultra-short acting barbiturate                   | (d) Esmolol                    |
| (v) Dissociative anaesthesia                          | (e) Geometrical isomer         |

D. Identify the following

- (i) Draw the structure of Methotrexate and identify the bioisosteric replacement in it with reference to substrate
- (ii) Identify the drug from its IUPAC nomenclature and draw its chemical structure: 1-(naphthalen-1-yloxy)-3-[(propan-2-yl)amino]propan-2-ol
- (iii) Identify the drug from its structure and write its IUPAC nomenclature:



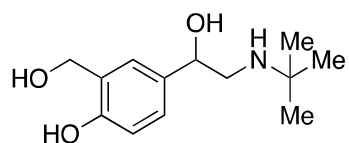
- (iv) Draw the structure of Chlorprothixene and identify the basic nucleus in it.
- (v) Identify the drug and draw its structure: It is an NMDA inhibitor administered parenterally for producing anaesthesia

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**PART-II**  
**Short Answers**  
(Instruction: Answer seven out of nine questions)

(7 x 5 = 35 Marks)

- Q2. List the factors influencing the aqueous solubility of the drug molecule. Define Polymorphism. Name two drugs that exist in different polymorphic forms. Summarize the effect of polymorphism on drug solubility with one example.
- Q3. Identify the structural components responsible for activity, selectivity and metabolic stability. With the general structure for Adrenergic agonists.
- Q4. Design a general synthetic pathway for the synthesis of phenylethylamine class of adrenergic agonists/ given below



- Q5. Analyse the structural features required for designing an anticholinesterase inhibitor by considering the structure of Carbidopa and Neostigmine.
- Q6. Construct the synthetic route for anticholinesterase inhibitor starting from 3-amino phenol.
- Q7. Give an account of Structure activity relationship of benzodiazepine class of sedatives and hypnotics
- Q8. Elaborate the synthesis of drug that falls under dibenzazepine class and used in the treatment of trigeminal neuralgia
- Q9. What is meant by pre-anaesthetic medication? Why is it required? List the class of drugs used in pre-anaesthetic medication with suitable example.
- Q10. Elaborate the synthesis of Halothane, write its IUPAC nomenclature and Adverse effects if any.

**PART-III**  
**Long Answers**  
(Instruction: Answer two out of three questions)

(2 x 10 = 20 marks)

- Q11. Present a short survey on optical isomerism in drugs and their influence on pharmacokinetics and pharmacodynamics of drug molecules.
- Q12. Discuss in detail the mechanism of hydrolysis of acetylcholine by acetylcholinesterase and chemistry of organophosphorus poisoning.
- Q13. Elaborate the synthesis of the following: (i) Fentanyl and (ii) Mefenamic acid

:::24/04/2019 E:::