Date:

Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27.
M.Sc. CHEMISTRY - IV SEMESTER
SEMESTER EXAMINATION: APRIL-2023
(Examination conducted in March-2023)

OCH-0219 MEDICINAL CHEMISTRY

Time- 2 hour 30 minutes Max. Marks-70

This question paper contains **TWO** printed pages, **THREE** parts and **SEVENTEEN** questions.

Part A

Answer any SIX questions. Each question carries TWO marks. 2 X 6 = 12

1. Mention any two drugs which are discovered without the lead molecule.
2. Explain Lipinski's rule of five.
3. Describe the terms IND and NCE.
4. Define 'pharmacophore' and lead.
5. Give an example for 'Nucleoside Reverse Transcriptase Inhibitors (NTRIs).'
6. Can an antibiotic drug be used in the 'treatment of influenza'? Justify your answer.
7. What is hypertension? Give any two causes for it.
8. Name a natural product used in the treatment of cancer.

Part B

Answer any FOUR questions. Each question carries TWELVE marks. 12 X 4 = 48

9. a) Explain soft drug. Mention any three methods to design a soft drug.
   b) Explain clinical trials: phase-I, phase-II and phase-III. (6+6)

10. a) Mention different type of immunoassays and explain ELISA-type assays.
    b) Mention any four criteria for a good medicine.
    c) Classify receptor. Explain G-protein-coupled receptors. (4+4+4)

11. a) Why peptides are not a good drug candidate? Explain the four types of peptidomimetics.
    b) Define metabolism. Explain any four methods to render drug more resistance to metabolism. (6+6)

12. a) Give the synthesis of ibuprofein starting from isobutyl benzene.
    b) With mechanism explain the mode of action of β-lactum antibiotics.
    c) What are histamines? Mention their role in allergic reaction. (4+4+4)

13. a) Differentiate between the following:
    (i) 'anxiolytics' and 'hypnotics' used in CNS drugs.
    (ii) 'DPP-4 inhibitors' and 'incretin mimetics' used in anti-diabetic drugs.
    b) Classify prodrugs with examples. (6+6)

14. a) With suitable example explain the role of the following used in treatment of cancer.
(i) alkylating agents (ii) antimetabolites (iii) antibiotics.
b) With suitable example explain the mechanism of action of various classes of CNS stimulants. (6+6)

Part C

Answer any TWO questions. Each question carries FIVE marks. 5 X 2 = 10

15. a) A 18 years old brought to hospital due to drug overdose. Which route is most desirable for administering the antodote? (i) Oral (ii) IV. Justify.
b) A drug is a weakly basic drug with a pKa of 7.8. If administered orally at which of the following site of absorption will the drug be able to readily pass through the membrane? Explain.
(i) Mouth (pH 7)
(ii) Stomach (pH 2)
(iii) Ileum (pH 7)
(iv) Small intestine (pH 8) (2+3)

16. a) A painkiller 'remifentanil' is having a therapeutic index of 33,000:1, while diazepam, a benzodiazepine sedative-hypnotic and skeletal muscle relaxant, has a less forgiving therapeutic index of 100:1. Morphine is even less so with a therapeutic index of 70:1. Which is the best drug? Explain.

b) Industrial workers working in dynamite factories (exposed to nitrates) developed headache, dizziness on Monday and by Friday they would overcome this. This condition is known as 'Monday disease.' Explain the cause for this. (2+3)

17. a) Increased risk of hypoglycaemia and weight gain is the common side effect of drugs used in managing type-2 diabetes mellitus. Following are some commonly used drugs, alone or in combination for the management of type-2 diabetes mellitus.
(i) Metformin (ii) Pioglitazone (iii) Glipizide (iv) Sitagliptin
Choose the correct combination which is neutral and without risk of hypoglycemia. Justify.

b) 64-year-old woman with a history of type-II diabetes is diagnosed with heart failure, which of the following would be an improper choice in controlling her diabetes. Give reason.
(i) Metformin (ii) Pioglitazone (iii) Glipizide (iv) Exenatide (3+2)

----------End of questions----------