

2021

CHEMISTRY — HONOURS

Paper : SEC-B-3

(Pharmaceuticals Chemistry)

Full Marks : 80

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Question no. 1 is compulsory and answer **any twelve** questions from the rest (Question numbers **2-15**).

1. Answer **any twenty** questions :

1×20

- (a) Define 'drug'.
- (b) What is the chemical name of aspirin? Write down the structure of aspirin.
- (c) What do the terms 'PDD' and 'TDD' stand for in pharma industries?
- (d) What is the function of an antiinflammatory drug?
- (e) Differentiate between antipyretic and analgesic drugs regarding their actions.
- (f) What type of antibiotic is cephalosporin?
- (g) What is the other name of 'Ligand Based Drug Design'?
- (h) What do you mean by nucleocapsid?
- (i) Name one 'opioid' and one 'non-opioid' analgesics.
- (j) Give two examples of 'narrow spectrum antibiotics'.
- (k) Mention two side effects of the drug glyceryl trinitrate.
- (l) Acyclovir belongs to what type of drugs? Give one use of it.
- (m) Which microorganism is used in the production of citric acid?
- (n) What is must to convert glucose into ethanol? Show the reaction.
- (o) What are isosteres?
- (p) What is the configuration of lysine, produced by fermentation process?
- (q) What is the common binding pattern of a hydroxyl group of a drug molecule when it binds to a receptor?
- (r) Which vitamin is synthesised by Reichstein-Grüssner process?
- (s) Why is fluorene considered an isostere of hydrogen?
- (t) Apart from penicillin, name any two antibiotics that are produced by fermentation.

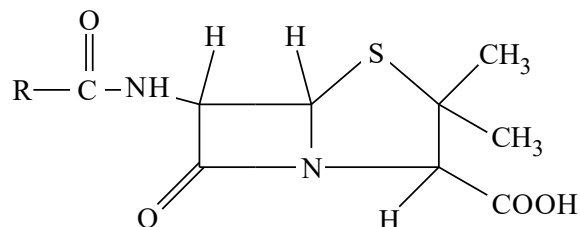
Please Turn Over

- (u) Why is the production of vitamin B₂ done by fermentation only and not by any chemical process?
- (v) What is the biological importance of glutamic acid?
- (w) Name two drugs which are used as antibacterial agents.
- (x) Name any two synthetic strategies to prepare synthetic analogues.
2. (a) How can a drug be targetted to a specific organ?
- (b) Write one each for advantage and disadvantage of herbal medicine. 3+2
3. (a) Show the synthetic route for the preparation of aspirin. Give one use of aspirin.
- (b) Write down the structure of chloramphenicol. Explain its function in the human body. 3+2
4. (a) What do you understand by 'screening process' in drug development? Mention its significance.
- (b) What do you mean by 'lead compounds'? Give one example. 3+2
5. What do you mean by 'pharmacokinetic phase'? What are the four steps involved in pharmacokinetic process? 2+3
6. (a) How does rigidification of structure increases the drug activity and decreases side effects?
- (b) How does an aromatic ring of a drug bind in the binding site and how would you confirm it? 3+2
7. (a) Show the synthetic route of phenobarbital.
- (b) Write two uses of phenobarbital. 3+2
8. (a) How is glyceryl trinitrate synthesised?
- (b) Write down two uses of glyceryl trinitrate. 3+2
9. Show the retrosynthesis and forward synthesis of the drug dapsone. 2½+2½
10. Show the retrosynthetic and synthetic pathways to synthesise sulphonamide. 2½+2½
11. (a) How would you synthesise zidovudine from thymidine?
- (b) Write down two uses of zidovudine. 3+2
12. Show the schematic diagram for the production of ethanol by fermentation process. 5
13. Write a short note on the production of vitamin B₁₂ by fermentation process. 5

(3)

T(4th Sm.)-Chemistry-H/(SEC-B-3)/CBCS

14. (a) The general structure of penicillin is as follows :



With the substituents of different R groups, about six natural penicillins have been isolated. These are penicillins G, K, V, X, O and F. Assign the different penicillins by putting appropriate R in the structure shown above.

- (b) What do you mean by LD₅₀ and ED₅₀? 3+2

15. What is viral replica? Describe the basic stages needed for viral replica. 1+4
