

2023

CHEMISTRY — HONOURS

Paper : SEC-B-1

(Pharmaceuticals Chemistry)

Full Marks : 80

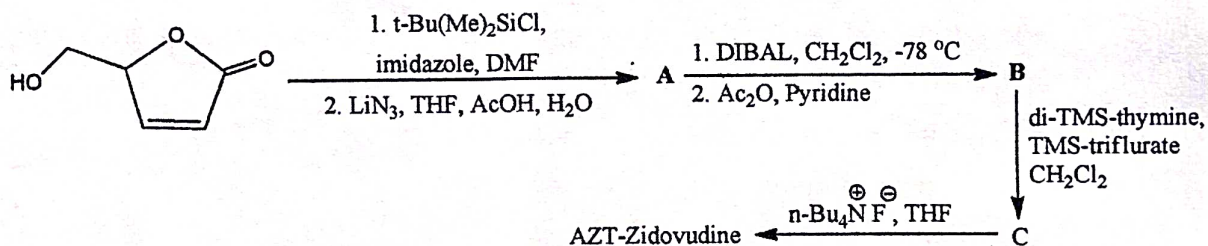
*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Question no. 1 is compulsory and answer any twelve questions from the rest (question nos. 2 to 15).*1. Answer *any twenty* questions :

1×20

- Name two microorganisms that are capable of synthesizing Vitamin B₂.
- What do you mean by therapeutic ratio or index?
- Mention two serious side effects of the drug ibuprofen.
- Give an example of drug which has analgesic, antipyretic and anti-inflammatory activity.
- Write the structure of *L*-lysine.
- Name one 'opioid' and one 'non-opioid' analgesics.
- Give an example of antioxidant.
- What do you mean by 'PDD' and 'TDD' in pharma industries?
- What are isosteres?
- Give an example of antiviral drug.
- What is the full form of NSAID?
- Write the number and stereochemistry of the chiral centre present in the biologically active chloramphenicol.
- Which metal ion present in Vitamin B₁₂?
- Name two drugs, used as antibacterial agents.
- What is the medicinal use of dapsone?
- What is the use of aspirin?
- Write the name of an antifungal agent.
- Write the difference between aerobic and anaerobic fermentation.
- Give one example of antianginal drug.

Please Turn Over

- (t) What are synthons?
 (u) What are the uses of sulphacetamide?
 (v) Name two antibiotics that are produced by fermentation.
 (w) Name an anti-anxiety drug.
 (x) Which Vitamin is synthesised by Reichstein-Grussner process?
2. (a) Write down two uses of phenobarbital and its side effects.
 (b) What do you mean by 'lead compounds'? Give one example. 3+2
3. Show the retrosynthesis and forward synthesis of chloramphenicol. 3+2
4. (a) Write down the synthetic route of diazepam.
 (b) What do you mean by NOAEL (No Observed Adverse Effect Level)? 3+2
5. (a) Describe briefly the formation of ethanol from glucose by an anaerobic fermentation process using yeast.
 (b) What do you mean by agonist drugs and antagonist drugs? 3+2
6. (a) Write down the structures of 'A', 'B' and 'C' in the following reactions.



- (b) What do you mean by 'high throughput screening (HTS)' and 'cross-screening' in drug discovery? 3+2
7. Synthesis aspirin from phenol. Write two uses of it. 3+2
8. Show the retrosynthesis and forward route of acyclovir. 3+2
9. (a) Give one example of β -lactum antibiotic with structure. Why is it named such?
 (b) What do you mean by LD_{50} and ED_{50} ? 3+2
10. (a) Write the structures of 'P', 'Q' and 'R' in the following scheme of the reactions.
- $$\text{Ph-CH}_2\text{-CO}_2\text{Et} + (\text{CO}_2\text{Et})_2 \xrightarrow{\substack{1. \text{NaOEt, EtOH} \\ 2. \text{H}_3\text{O}^+ \\ 3. 160^\circ\text{C}}} \text{P} \xrightarrow{\substack{1. \text{NaOEt, EtOH} \\ 2. \text{EtBr}}} \text{Q} \xrightarrow{\substack{1. \text{Urea, NaOEt, EtOH} \\ 2. \text{H}_3\text{O}^+}} \text{R}$$
- (b) What do you mean by 'nucleocapsid'? 3+2

11. Show the retrosynthesis and forward synthesis of sulphonamide. 3+2
12. (a) How can glyceryl trinitrate be synthesized?
(b) Write down the uses and side effects of glyceryl trinitrate. 3+2
13. (a) Give two similarities and two dissimilarities between batch and continuous fermentation processes.
(b) What is meant by pharmacokinetic phase? 3+2
14. Write a short note for the formation of Vitamin B₁₂ by fermentation process. 5
15. (a) What are auxotrophic and prototrophic strains?
(b) Name two vitamins that are required for production of L-lysine in fermentation process. 3+2

Paper : SEC-B-2
(Pesticide 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.*

Answer *question no. 1* and answer *any twelve* questions from the rest (*question nos. 2-15*).

1. Answer *any twenty* questions :

1×20

- (a) What is Persistent Organic Pollutant (POP)?
- (b) Give two examples of synthetic pesticides.
- (c) What is a weed?
- (d) What is the starting material for the production of Lindane?
- (e) Give an example of natural pesticide.
- (f) What are microbial pesticides?
- (g) What is ovicide? Give an example.
- (h) Name two organic pesticides.
- (i) Write down the major component of Bordeaux mixture.
- (j) What is meant by 'Disease of ecotopes'?
- (k) What is the precursor for the production of malathion? Write down its structure.
- (l) Provide the name and chemical structure of a rice herbicide from the chloroacetanilide family.
- (m) What is butachlor?
- (n) Write down two examples of carbamate pesticide.
- (o) Write down the name of first bioinsecticide developed on commercial scale.
- (p) Write down the name of a cholin esterase inhibitor.
- (q) Name the pesticide that is most commonly used to protect wooden structures from termite attack.
- (r) What is Fenarimol?
- (s) Give an example of warm-blooded animal.
- (t) Why is folidol banned or restricted to use in our country?
- (u) What are zoocides?
- (v) What is the acute oral toxicity (LD_{50}) value of gammaxene for rats?

2. (a) Describe three methods of pest control.
(b) What is the difference between contact and systematic herbicides? 3+2
3. Discuss the classification of pesticides based upon chemical nature. 5
4. (a) Discuss the mode of action :
(i) Stomach poison pesticides
(ii) Fumigants.
(b) What are Nematicides? Give an example. 3+2
5. Discuss some important methods used for pesticide management. 5
6. (a) What are the differences of mechanism of action between DDT and Lindane?
(b) Write down the chemical reaction and conditions involved in the synthesis of DDT. 3+2
7. Outline different steps involved in manufacturing a pesticide. 5
8. (a) Describe briefly the synthesis of carbofuran with chemical reaction.
(b) What are the carbofuran poisoning symptoms? 3+2
9. (a) Provide the names of two agricultural fungicides from the quinone family. Write down their structures.
(b) Mention two side effects of DDT. 3+2
10. (a) Give a brief outline of the preparation of chloranil.
(b) Provide one example of each of triazolopyrimide and triketone based herbicides. 3+2
11. (a) Why are biopesticides more favourable over the chemical pesticides?
(b) Define biopesticides. 3+2
12. (a) Mention the uses and side effects of carbaryl.
(b) Write down the structures of carbaryl and its hydrolysed products. 3+2
13. (a) Explain the mode of action of α -chloroacetanilides.
(b) Mention one use and one side effect of α -chloroacetanilide. 3+2
14. (a) Briefly discuss the various uses of gammaxene.
(b) Indicate the mechanism of action of gammaxene. 3+2
15. (a) Discuss the harmful effects of butachlor.
(b) Write down any one method for the preparation of butachlor. 3+2
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