

2021

CHEMISTRY — HONOURS

Paper : SEC-B-4

(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 any twelve questions from the rest (Q. nos. 2 to 15).

1. Answer *any twenty* questions :

1×20

- (a) Give one example of Persistent Organic Pollutants (POPs).
- (b) What are zoocides?
- (c) Give two reasons for the choice of the biopesticides over the chemical pesticides.
- (d) Which classification of pesticides includes carbamates?
- (e) Write the name of first organic pesticide used commercially.
- (f) Give two examples of biopesticide.
- (g) Write down the name of most famous pesticide of the world.
- (h) Write down one example of microbial insecticide.
- (i) What is a pest?
- (j) Mention the uses of chloranil.
- (k) What is the structural difference between butachlor and alachlor?
- (l) What is 'folidol'? Why is it either banned or in restricted use in the country?
- (m) Give two examples of pesticide spray.
- (n) What is rodenticide?
- (o) Give an example of a natural pesticide.
- (p) Write down the major component of Bordeaux mixture.
- (q) Which enzyme hydrolyses malathion?
- (r) Which isomer of benzene hexachloride carries insecticidal properties?
- (s) Which substituent is present at the *para* position of the benzene ring present in parathion?
- (t) What condition is needed for optimum herbicidal activity of 'achlor'?
- (u) What is the acute oral toxicity (LD₅₀) value of gammaxene for rats?

Please Turn Over

- (v) Chlorinated quinones are most toxic to which organism?
- (w) What is meant by 'acaricides'?
- (x) What is fungicide?
2. (a) What are pesticides?
- (b) What are the notable aims of pesticide research? 2+3
3. (a) What do you mean by the term 'Structure-Activity-Relation' (SAR)?
- (b) What is the significance of the analysis of SAR studies of pesticides? 2+3
4. (a) Mention any four toxic effects of pesticides in human body.
- (b) What are the criteria recommended by the EPA for reduce-risk pesticides? 2+3
5. (a) What is DDT? What do the letters DDT stand for?
- (b) How is DDT synthesised in the laboratory? What happens when both the chlorine atoms present at the *para* positions of the phenyl rings in DDT get transferred to *ortho* positions? 2+3
6. (a) Write down the chemical reactions involved in the synthesis of parathion.
- (b) What is methylparathion? Compare the activity between parathion and methylparathion. 2+3
7. (a) Explain the mode of action of α -chloroacetanilides.
- (b) Mention uses and side effects of α -chloroacetanilides. 2+3
8. (a) Briefly discuss the uses of gammaxene.
- (b) How is alachlor synthesised? 2+3
9. (a) Carry out the following conversion :
2, 3-Dihydro-2,2-dimethyl-7-hydroxybenzofuran to carbofuran.
- (b) Mention uses and side effects of carbofuran. 2+3
10. (a) Give two examples of insecticides.
- (b) What are the general features of carbamates as insecticides? 2+3
11. (a) Draw the structure of folidol.
- (b) Compare the thion-thiol isomerisation of parathion and methylparathion at high temperature. 2+3
12. Briefly discuss the mode of action of organophosphates on warm blooded animals. 5
13. (a) Explain the classification of pesticides by target organism. Give one example of each.
- (b) Discuss the mode of action of gammaxene with the enzyme glutathione-S-transferase. 2+3

(3)

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

14. (a) Why are quinones chlorinated in pesticide chemistry?
(b) What is fungitoxicity? Write down the name and structure of one fungitoxic agent. 2+3
15. (a) What are the uses of carbaryl?
(b) How would you synthesise carbaryl from 1-naphthol? Write down the chemical reactions involved in the synthesis. 2+3
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