

(3 hours)

Total Marks: 100

**Instructions: Please check that you have got the correct question paper**

- i) All questions are compulsory. Choice is internal.
- ii) Figures to the right indicate full marks.
- iii) Draw structures and diagrams wherever necessary.

**Q.1A) State true or false: (04)**

- i) Incomplete biodegradation of organic compounds is known as biotransformation.
- ii) Dehydrogenases act on aliphatic and aromatic compounds.
- iii) Bacteria can be used as biopesticide.
- iv) PCB and TNT are complex soil pollutants.

**Q.1B) Write short notes on: (Any three) (09)**

- i) Factors affecting biodegradation
- ii) Resistance of xenobiotics
- iii) Anaerobic biodegradation
- iv) Biological pest control
- v) Advantages of biopesticides
- vi) Phytoremediation

**Q.1C) Answer the following: (Any two) (12)**

- i) Compare and contrast: *Ex situ* and *In situ* bioremediation
- ii) Explain in detail about creation of superbug with the help of diagrammatic representation.
- iii) Elaborate on bioremediation of ground water
- iv) Give detailed account of biofertilizers mentioning examples.

**Q.2A) State true or false: (04)**

- i) Trade name of a drug is the same throughout the world.
- ii) Elixirs contain high amount of alcohol.
- iii) Drugs can only be obtained from natural sources.
- iv) Intramuscular injections are administered at 90° to the skin surface.

**Q.2B) Write short notes on: (Any three) (09)**

- i) Transdermal route of drug administration
- ii) Physical and chemical properties of drugs
- iii) Significance of Therapeutic index
- iv) Classification of drugs
- v) Factors affecting drug dosage
- vi) Excipients

**Q. 2C) Answer the following: (Any two) (12)**

- i) Compare the different parenteral routes for drug delivery stating their: (i) Characteristics (ii) Advantages (iii) Disadvantages
- ii) Write an elaborate note on the various dosage forms of drugs.
- iii) Discuss why NDSS is the future of pharmacology?
- iv) Patient X has to take Acetyl salicylic acid. Explain its: (a) Trade name (b) preferred route of administration (c) Pharmacological effect (d) Adverse effects.

**Q.3A) State true or false: (04)**

- i) Municipal solid waste contains 30-40% organic matter.
- ii) Polyelectrolytes are used as coagulants during waste water treatment.
- iii) Biomass is a good source of energy.
- iv) Starchy material can be used for production of energy.

**Q.3B) Write short notes on: (Any three) (09)**

- i) Types of sewage
- ii) Preliminary treatment of waste water
- iii) Production of biodiesel
- iv) Natural gas
- v) Vermicomposting
- vi) Facultative pond

**Q.3C) Answer the following: (Any two) (12)**

- i) Write in details about 'Phostrip' process stating the principle of phosphate removal.
- ii) Enlist aerobic attached growth treatment processes used for waste water treatment and describe any two of them.
- iii) Give detailed account of types, sources and disposal of solid waste.
- iv) Write informative note on biogas production mentioning its uses.

**Q.4 A) Define and explain the following : (Any five) (10)**

- i) Bioaugmentation
- ii) Bioaccumulation
- iii) Detoxification
- iv) Inunction
- v) Maintenance dose
- vi) Flocculation
- vii) Sludge

**Q.4B) Attempt the following: (Any three) (15)**

- i) Elaborate on biofertilizers and their advantages.
- ii) Write an informative note on biofungicides.
- iii) Which drugs can be administered through oral route? State the advantages and disadvantages of the same.
- iv) Discuss different sources of the drugs.
- v) Write a note on energy rich crops.
- vi) Give detailed account of tertiary treatment of waste water.