

**2025/FYUG/ODD/SEM/
CHMSEC-201T/462**

FYUG Odd Semester Exam., 2025

CHEMISTRY

(3rd Semester)

Course No. : CHMSEC-201T

(Forensic Chemistry)

Full Marks : 50

Pass Marks : 20

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. Answer any *three* of the following questions :

1×3=3

- (a) What are the two different types of columns used in gas chromatography (GC)?

(2)

- (b) What is meant by R_f value?
- (c) What is the frequency range of IR light?
- (d) Which equipment is used for colorimetry?

2.

- Answer any one of the following questions:
- (a) How does gas liquid chromatography (GLC) differ from gas chromatography (GSC)?
 - (b) Write the principle of infrared spectroscopy.

3.

- Answer any one of the following questions:
- (a) Briefly explain the principle of thin layer chromatography (TLC). What are the common techniques used for visualizing results of a TLC plate? Give two forensic applications of TLC.
 - (b) Explain the fundamental principle of colorimetric analysis. Discuss its application in real life.

(3)

UNIT—II

Answer any three of the following questions :
1×3=3

- (a) What is the primary purpose of fingerprint development?
- (b) Which chemicals are commonly used for fingerprint development?
- (c) Name any two constituents of sweat residue.
- (d) What type of light is used to visualize latent fingerprint?

2

- Answer any one of the following questions :
- (a) How does latent fingerprint differ from patent fingerprints?

- (b) Write the importance of fingerprints in forensic science.

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- Answer any one of the following questions :

- (a) Explain the mechanism of detection of latent fingerprints by chemical techniques.

- (b) Discuss the different methods used for the preservation of developed fingerprints.

(4)

UNIT—III

7. Answer any three of the following questions:

- (a) What is acute toxicology?
- (b) What does ELISA detect?
- (c) What is effective dose 50 (ED₅₀)?
- (d) Name the test that is used to detect alcohol in breath.

8.

Answer any one of the following questions:

- (a) What is meant by dose-response relationship? How is ED₅₀ useful in dose-response studies?
- (b) What is immunoassay and how is it useful in toxicology?

9.

Answer any one of the following questions:

- (a) Discuss the significance of toxicological findings in forensic investigations.
- (ii) Differentiate between clinical toxicology and forensic toxicology.

(5)

selective toxicity? How

1+1=2

(i) What is selective toxicity develop? How does toxicity develop? different biological samples that are examined in toxicological studies. 3

UNIT—IV

Answer any three of the following questions: 1×3=3

Why are narcotics used?

- (a) State one behavioural symptom of addiction.
- (b) Name the Act in India that regulates narcotics and psychotropic substances.
- (c) Give two examples of natural psychotropic stimulants.

Answer any one of the following questions: 2

- (a) What are hallucinogens? Give two examples. 1+1=2
- (b) Define the term 'euphoria'. Give two examples of drugs that produce it. 1+1=2

(6)

12. Answer any one of the following questions :

2

- (a) (i) State one therapeutic and harmful effect of stimulants.
- (ii) What is meant by 'drug abuse'? Explain taking a suitable example.
- (iii) Which class of drugs slows down brain activity?
- (b) (i) What are designer drugs? Give two examples.
- (ii) Differentiate between tolerance and addiction.
- (iii) Give two examples of analgesics.

UNIT—V

13. Answer any three of the following questions :

1×3=3

- (a) Define arson.
- (b) What is fire triangle?
- (c) Give one example each of a low and a high explosive.
- (d) How to store arson evidence?

(7)

Answer any one of the following questions :

2

- (a) Mention any two motives for committing arson and explain briefly.
 - (b) Differentiate between sampling in fire debris and headspace sampling in fire debris analysis.
- Answer any one of the following questions :
- (a) Explain the synthesis and important characteristics of PETN and RDX.
 - (b) Describe the systematic collection and post-blast residue analysis with suitable examples.

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