

**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 : 2

- (a) How does gas liquid chromatography (GLC) differ from gas solid chromatography (GSC)?
- (b) Write the principle of infrared (IR) spectroscopy.

3. Answer any *one* of the following questions : 5

- (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. $2+1+2=5$
- (b) Explain the fundamental principle of colorimetric analysis. Discuss its application in real life. $3+2=5$

(3)

UNIT—II

4. 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?
5. Answer any *one* of the following questions : 2
- (a) How does latent fingerprint differ from patent fingerprints?
 - (b) Write the importance of fingerprints in forensic science.
6. Answer any *one* of the following questions : 5
- (a) Explain the mechanism of detection of latent fingerprints by chemical techniques.
 - (b) Discuss the different methods used for the preservation of developed fingerprints.

UNIT—III

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

1×3=3

- (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 : 2

- (a) What is meant by dose-response relationship? How is ED₅₀ useful in dose-response studies? 1+1=2
- (b) What is immunoassay and how is it useful in toxicology? 1+1=2

9. Answer any *one* of the following questions : 5

- (a) (i) Discuss the significance of toxicological findings in forensic investigations. 3
- (ii) Differentiate between clinical toxicology and forensic toxicology. 2

(5)

- (b) (i) What is selective toxicity? How does toxicity develop? $1+1=2$
- (ii) Discuss the different biological samples that are examined in toxicological studies. 3

UNIT—IV

10. Answer any *three* of the following questions : $1 \times 3 = 3$

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

11. 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. $1+1=2$

- 12.** Answer any *one* of the following questions : 5
- (a) (i) State one therapeutic and one harmful effect of stimulants. 2
- (ii) What is meant by 'drug abuse'? Explain taking a suitable example. 2
- (iii) Which class of drugs slows down brain activity? 1
- (b) (i) What are designer drugs? Give two examples. 1+1=2
- (ii) Differentiate between tolerance and addiction. 2
- (iii) Give two examples of analgesics. 1

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?

14. Answer any *one* of the following questions : 2

(a) Mention any two motives for committing arson and explain briefly.

(b) Differentiate between solvent extraction and headspace sampling in fire debris analysis.

15. Answer any *one* of the following questions : 5

(a) Explain the synthesis and important characteristics of PETN and RDX.

(b) Describe the systematic process of post-blast residue collection and analysis with suitable examples.

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