

Printing Pages: 2

Paper Code: BSC-FS-502

A

(SVSU:2025-26/R)

Enrollment No.

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Program Name – B.Sc. Forensic Science

Year/Semester- III/V Examination Year

Subject Name- Forensic Toxicology

Subject Code- BS-FS-502

Timing: 3:00 Hours

[Max. Marks: 70]

Note: 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs)

[01×15=15]

I. The primary purpose of post-mortem toxicology is to determine:

- (a) The time since death.
- (b) DNA sample
- (c) The manner of death
- (d) Detect and measure toxic substances

II. Which of the following describes the LD50 value?

- (a) The dose that causes a detectable effect in 50% population.
- (b) The dose that produces toxicity in 50% population.
- (c) The dose that is lethal to 50% population.
- (d) The dose that is administered to 50 individuals.

III. Which rapid and cost-effective method is commonly used to screen drugs of abuse in body fluids?

- (a) Gas-Liquid Chromatography
- (b) Thin-Layer Chromatography
- (c) High-Performance Liquid Chromatography
- (d) Immunoassay

IV. Proof spirit is defined as an alcoholic beverage containing what percentage of alcohol by volume (approximate)?

- (a) 50%
- (b) 57.1%
- (c) 70%
- (d) 95%

V. Which classification of poison refers to substances that mainly interfere with oxygen transport and cellular respiration?

- (a) Corrosives
- (b) Irritants
- (c) Systemic
- (d) Neurotoxins

VI. The most crucial step in Crime Scene Management in illicit liquor cases is to:

- (a) Documenting the scene
- (b) Identify suspects
- (c) Collecting samples of the illicit beverage
- (d) All the above

VII. A poison acting on acetylcholine receptors at the neuromuscular junction is found in

- (a) Vegetable poisons
- (b) Animal poisons
- (c) Systematic Poison
- (d) Metal salts

VIII. Which factor complicates narcotic analysis in postmortem blood?

- (a) High drug concentration.
- (b) Postmortem redistribution.
- (c) Absence of metabolites.
- (d) None of the above

IX. Tolerance in the context of narcotics and drugs refers to:

- (a) The body's adverse reaction upon cessation of the drug.
- (b) The psychological craving for the drug
- (c) The need for increasingly larger doses to achieve the desired effect
- (d) The state of physical and mental dependence.

X. Which is a characteristic of a Designer Drug?

- (a) It is derived directly from a natural plant source
- (b) Structural or functional analog of a substance to mimic effects

- (c) It is only used for legitimate medical purposes.
- (d) It has been completely legalized by international treaties.
- XI.** Which analytical technique uses an inert gas as the mobile phase?
  - (a) High Performance Liquid Chromatography (HPLC)
  - (b) Thin Layer Chromatography (TLC)
  - (c) Gas-Liquid Chromatography (GLC)
  - (d) Microcrystalline testing
- XII.** The most common antidote used in treatment of opioid overdose is:
  - (a) Atropine
  - (b) Activated Charcoal
  - (c) Ethanol (Ethyl Alcohol)
  - (d) Naloxone
- XIII.** In the context of Human Performance Toxicology, the analysis is primarily concerned with assessing the impairment of:
  - (a) Cognitive and motor skills
  - (b) Respiration rate.
  - (c) Body temperature regulation.
  - (d) Liver function.
- XIV.** The term viscera in toxicology refer to:
  - (a) Skin and hair samples.
  - (b) Bones and teeth
  - (c) Internal organs
  - (d) Stomach contents only.
- XV.** Carbon Monoxide (CO) poisoning primarily causes harm by:
  - (a) Directly destroying lung tissue
  - (b) Corroding the stomach lining
  - (c) Binding to haemoglobin and displacing oxygen
  - (d) Causing immediate necrosis of the brain.

- 2. Long Answer Type Questions (Attempt any three) [10×3=30]**
- a. Define the Dose-Response Relationship and explain its significance in toxicology.
  - b. Discuss the broad classification of poisons based on their mode of action, giving two examples for each class.
  - c. Differentiate between Narcotics, Stimulants, Depressants, and Hallucinogens, giving a common example of each type.
  - d. Describe the principles of Thin Layer Chromatography (TLC) and High-Performance Liquid Chromatography (HPLC) as isolation and identification techniques for purifying narcotics and drugs.

- 3. Short answer type questions (any five) [5 x 5 =25]**
- a. Explain the significance of toxicological findings in a medico-legal investigation.
  - b. Differentiate between Accidental, Suicidal, and Homicidal poisonings, providing one example of a poison typically associated with each category.
  - c. Briefly describe the collection and preservation of viscera, blood, and urine in a suspected poisoning case for subsequent toxicological analysis.
  - d. Explain the concept of Microcrystalline testing and state its application in the forensic analysis of drugs of abuse.
  - e. What are the characteristic of withdrawal symptoms associated with chronic use and subsequent cessation of narcotics (opioids)?
  - f. Describe the steps involved in searching a dwelling for narcotics, drugs, and psychotropic substances during a crime scene investigation.
  - g. Write a short note on Proof Spirit and the methods used for the estimation of ethyl alcohol in blood for forensic purposes.

Printing Pages: 2

Paper Code: BSC-FS-501

B

(SVSU:2025-26/R)

Enrollment No.

Program Name – B.Sc. Forensic Science

Year/Semester- III/V Examination Year

Subject Name- Forensic Ballistics

Subject Code- BSC-FS-501

Timing: 3:00 Hours

[Max. Marks: 70]

Note: 1. Attempt all the questions as per the given instructions.

**I. Multiple Choice Questions (MCQs)**

[01x15=15]

**I. Identify the propellant commonly used in modern small arms ammunition.**

- (a) Black powder (b) Cordite (c) Smokeless powder (d) Gun cotton

**II. Determine which component of a cartridge initiates the firing process.**

- (a) Primer (b) Propellant (c) Bullet (d) Case

**III. Choose the correct sequence in the firing mechanism of a firearm.**

- (a) Firing → Loading → Extraction (b) Loading → Firing → Extraction
- 
- (c) Extraction → Firing → Loading (d) Firing → Extraction → Loading

**IV. Recognize the firearm type that uses energy from recoil to reload automatically.**

- (a) Bolt action rifle (b) Pump action shotgun
- 
- (c) Semi-automatic pistol (d) Revolver

**V. Explain why rifling is provided inside the barrel of a firearm.**

- (a) To reduce recoil (b) To increase bullet speed
- 
- (c) To impart spin and stability (d) To produce noise

**VI. Assess the main factor responsible for barrel erosion.**

- (a) Corrosive ammunition (b) High pressure gases
- 
- (c) Poor cleaning (d) Low temperature firing

**VII. Identify which parameter affects internal ballistics the most.**

- (a) Air resistance (b) Ignition time
- 
- (c) Target material (d) Striking velocity

**VIII. Recognize the function of the ballistic coefficient.**

- (a) Measures bullet hardness (b) Shows trajectory efficiency
- 
- (c) Defines striking angle (d) Classifies weapon type

**IX. Evaluate the effect of air resistance on bullet trajectory.**

- (a) It makes the bullet move faster (b) It increases bullet stability
- 
- (c) It slows down the bullet (d) It straightens the path

**X. Choose the correct match for an intermediate target.**

- (a) Human body (b) Glass window (c) Paper sheet (d) Sandbag

**XI. Determine which firearm component leaves firing pin impressions.**

- (a) Chamber (b) Ejector (c) Breech face (d) Firing pin

**XII. Identify the part that produces extractor marks on the cartridge case.**

- (a) Barrel (b) Magazine (c) Hammer (d) Extractor claw

**XIII. The *range of fire* can best be estimated by studying—**

- (a) Bullet caliber (b) GSR and powder patterns  
(c) Headstamp marks (d) Bullet weight

**XIV. Relate the significance of headstamp markings.**

- (a) Identify the shooter (b) Identify manufacturer and caliber  
(c) Indicate firing distance (d) Show batch number of propellant

**XV. During a trajectory analysis, investigators observe lateral deviation of the bullet. Which factor best explains this?**

- (a) Barrel erosion (b) Yaw and drift  
(c) Short-range firing (d) Thick target medium

**2. Long answers type questions (any three)**

**[10x3=30]**

**I. Write short notes on:**

- (a) Stopping power of bullets.  
(b) Erosion, corrosion, and choking in firearm barrels.

**II. Define gunshot residue. Also write the methods of detecting and collecting GSR.**

**III. Illustrate the components and working of Matchlock and Wheel lock firearms with the help of labelled diagrams.**

**IV. Explain how the shape and size of propellant grains affect the burning rate. Also differentiate Progressive and Regressive burning.**

**3. Short answers type questions (any five)**

**[5x5=25]**

**I. Elaborate the mechanism of action of a semi-automatic pistol.**

**II. Differentiate between improvised firearms and regular firearms in forensic examination.**

**III. Describe the effect of range on blackening, scorching, and tattooing around firearm wounds.**

**IV. Explain the procedure for distinguishing entrance wounds from exit wounds.**

**V. Write the forensic significance of breech face, extractor, and ejector marks on cartridge cases.**

**VI. Write the differences between vacuum and ideal trajectories of projectiles with well labelled diagram.**

**VII. Discuss the forensic relevance of tumbling bullets and their effect on targets.**

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Paper Code: BSC-FS-505

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(SVSU:2025-26/R)

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Program Name – B.Sc. Forensic Science

Year/Semester- III/V Examination Year

Subject Name- Forensic Serology

Subject Code- BSC-FS-505

Timing: 3:00 Hours

[Max. Marks : 70]

Note: 1. Attempt all the questions as per given instructions.

### 1. Multiple Choice Questions (MCQs)

[01x15=15]

I. In the Ring Assay, a positive reaction is indicated by:

- (a) The solution turns pink (b) Formation of bubbles between layers  
(c) Formation of a white precipitate ring at the interface (d) No change

II. Who discovered the Florence test?

- (a) Dr Karl (b) Dr Finny (c) Dr Florence (d) Dr Rebecca

III. An individual having B+ will form agglutination with which of the antiserum?

- (a) Anti A and Anti B (b) Anti D, Anti D and Anti B  
(c) Anti B and Anti D (d) None of the antigens

IV. Which of the following methods is used for the collection of blood samples?

- (a) Swabbing (b) Cutting (c) collect entire item (d) All of the above

V. Arrange the examination method of serological evidences in the proper sequence

- (a) Visual examination, Preliminary examination, Confirmatory test  
(b) Preliminary test, Visual examination, Visual examination  
(c) Visual examination, Confirmatory test, Preliminary test  
(d) Confirmatory, Preliminary test, Visual Test

VI. In starch Iodine test, the starch turns in the following colour on addition of iodine:

- (a) Bright Pink (b) Dark Blue (c) Deep Purple (d) Light Green

VII. Blood spatter analysis can determine

- (a) Origin of the blood stain (b) Angle of impact  
(c) Force of impact (d) All the above

VIII. The Christmas tree stain stains spermatozoa with:

- (a) Head: red, Tail: green, Midpiece: blue  
(b) Head: green, Tail: red, Midpiece: yellow  
(c) Head: blue, Tail: red, Midpiece: green  
(d) Head: pink, Tail: red, Midpiece: yellow

IX. Simple Sequence Repeat (SSR) markers are also known as:

- (a) Minisatellites (b) Microsatellite DNA  
(c) SNPs (d) AFLPs

**X. VNTRs stands for**

- (a) Varying number of transcription repeats
- (b) Variable Number of Tandem Repeats
- (c) Various Nucleotide Transport Route
- (d) Variable Nucleotide of Tandems Remains

**XI. What blood stain pattern is created or formed by the force of gravity acting alone:**

- (a) High Velocity Impact Spatter
- (b) Low Velocity Impact Spatter
- (c) Flow Pattern
- (d) Drip pattern

**XII. The crystals observed in Teichmann's test is**

- (a) Red feather like crystals
- (b) Brownish rhomboid crystals
- (c) Brown rectangular crystals
- (d) Pink needle shape crystals

**XIII. Which of the following is a colorimetric presumptive test for blood?**

- (a) Luminol
- (b) Phenolphthalein (Kastle-Meyer test)
- (c) Fluorescein
- (d) RSID@-Semen test

**XIV. What does CODIS stand for?**

- (a) Combined DNA Investigation System
- (b) Combined DNA Index System
- (c) Criminal DNA Identification System
- (d) Criminal DNA Index System

**XV. Which blood group is known as the "Universal Recipient"**

- (a) A group
- (b) AB blood group
- (c) B blood group
- (d) O blood group

**2. Long answers type questions (any three)**

**[10x3=30]**

- I. Define forensic serology and describe the analysis of blood evidence from a crime scene.
- II. Explain the collection and forensic examination of semen sample in sexual assault cases.
- III. What is blood spatter analysis and discuss the main types of bloodstain patterns found at crime scenes.
- IV. List the different genetic markers and explain their forensic significance.

**3. Short answers type questions (any five)**

**[5x5=25]**

- I. Write a note on the ABO blood grouping system and mention its forensic importance.
- II. Write a short note on antigens and antibodies. Mention the types of antibodies.
- III. Differentiate between extracellular and intracellular enzymes.
- IV. Discuss the Ouchterlony assay technique for species identification.
- V. Explain how blood spatter analysis helps in crime scene reconstruction.
- VI. Describe the absorption elution method for typing dried blood samples.
- VII. Write a note on the identification salivary  $\alpha$ -Amylase by immunochromatographic assays.

Printing Pages: 2

Paper Code: BSC-FS-503

A

(SVSU:2025-26/R)

Enrollment No.

Program Name – B.Sc. Forensic Science

Year/Semester- III/V Examination Year

Subject Name- Digital Forensic

Subject Code- BSC-FS-503

Timing: 3:00 Hours

[Max. Marks : 70]

Note: 1. Attempt all the questions as per given instructions.

**1. Multiple Choice Questions (MCQs) [01x15=15]**

**I. Identify the full form of CHS in hard disk addressing.**

- (a) Computer Hardware System (b) Cylinder-Head-Sector  
(c) Core Hardware Sector (d) Central Hard Storage

**II. Determine which unit executes all instructions in a computer.**

- (a) Hard Disk (b) RAM (c) CPU (d) Operating System

**III. Recognize the device commonly connected to a computer via cable.**

- (a) Icon (b) Virus (c) Database (d) Peripheral devices

**IV. Identify the main motive behind computer terrorism.**

- (a) Financial gain (b) Intellectual curiosity  
(c) Political motivation (d) Personal satisfaction

**V. State the main function of a backdoor in software.**

- (a) Malicious software removal (b) Unauthorized remote access  
(c) Hardware configuration (d) Data encryption

**VI. Identify the term used for malicious computer programs.**

- (a) Software piracy (b) Malware (c) PowerPoint (d) Photoshop

**VII. Explain the term decryption in digital forensics.**

- (a) Converting encrypted data into its original, readable format  
(b) Extracting deleted data  
(c) Removing password protection  
(d) Accessing raw disk data

**VIII. Which of the following is not a cybercrime?**

- (a) Denial of Service (b) Malware (c) Spamming (d) Encase

**IX. Select the correct example of an operating system.**

- (a) Python (b) Microsoft Word  
(c) Windows 10 (d) Google Chrome

**X. Choose the correct example of a storage device.**

- (a) BIOS (b) ALU (c) HDD (d) HDMI

**XI. Distinguish between a computer worm and a computer virus.**

- (a) A worm requires a host program (b) A worm replicates on its own  
(c) A virus spreads independently (d) A virus don't need user intervention

**XII. Email spoofing primarily involves:**

- (a) Email with a forged sender address
- (b) Unauthorized access
- (c) Sending unsolicited bulk messages
- (d) Monitoring user activities

**XIII. "Cyberspace" was coined by**

- (a) Richard Lee
- (b) William Gibson
- (c) Henry
- (d) Fauld

**XIV. Expand the abbreviation DoS.**

- (a) Denial of Service
- (b) Disk operating System
- (c) Duplication of Service
- (d) None of the above

**XV. Identify the method used to recover deleted computer files.**

- (a) Data encryption
- (b) Data extraction
- (c) Data recovery
- (d) Data hashing

**2. Long answers type questions (any three) [10x3=30]**

- I. Explain the following cybercrime concepts and discuss how each affects digital security:
  - (a) Intellectual Property Crime
  - (b) E-mail Bombing
  - (c) Software Piracy
- II. Define operating system? Write types and function of operating system.
- III. Examine various types of cybercrimes and analyze their effects on individuals, organizations, governments, and society, supporting your answer with relevant examples.
- IV. List the steps followed during the seizure of a suspected computer at a crime scene and explain the significance of each step in maintaining the integrity of digital evidence.

**3. Short answers type questions (any five) [5x5=25]**

- I. Distinguish between encryption and decryption in computer forensics, highlighting their roles in data protection and analysis.
  - II. Define cyber stalking and discuss its different types with suitable examples.
  - III. Differentiate between cybercrimes and traditional crimes, providing relevant examples to illustrate the differences.
  - IV. Label the process of email tracking and explain its importance in computer forensic investigations.
  - V. Discuss the functions and applications of various types of peripheral devices used in computer systems.
  - VI. Outline *forensically sterile media* and explain its significance in the handling of digital evidence.
  - VII. Explain the structure and components of a hard disk, describing its physical construction and main function.
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