KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages) **Reg. No: ……**

Question Code : 26E03416 **Course Code : 24USCF41**

UG Degree - End Semester Examinations, April 2026

Fourth Semester

B.Sc. CRIMINOLOGY AND FORENSIC SCIENCE

Forensic Serology

(For those who joined in July 2024 onwards)

Time : 3Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 K:1 1. What is the composition of blood in human body

(a) 5% (b) 8%

(c) 7% (d) 9%

CO:1 K:1 2. Which among the following is referred to as the strength of a single antigen- antibody bond at a single binding site

(a) Affinity (b) Avidity

(c) Specificity (d) Agglutination

CO:2 K:2 3. How can Takayama test be classified within the hierarchy of forensic blood analysis

(a) Confirmatory crystal test (b) Individualization method

(c) Species origin test (d) Preliminary presumptive test

CO:2 K:2 4. Which among the following illustrates the function of spectrophotometric methods in blood analysis

(a) Measuring light absorption to identify hemoglobin derivatives (b) Agglutinating RBC to determine ABO

(c) Creating crystals to confirm the presence of Blood (d) Separating DNA fragments by size

CO:3 K:1 5. Which among the following is identified as a cast off stain in a crime scene reconstruction involving struggle

(a) Large pool of blood
(b) Linear trail of droplets on ceiling
(c) Fine mist like spray near a gunshot wound
(d) Feathered edge smear on a door frame

CO:3 K:1 6. Where does the tail and satellite of a bloodstain point while utilizing directionality analysis

(a) Towards the source of blood
(b) In the direction the blood was travelling
(c) Perpendicular to the impact surface
(d) Towards the floor due to gravity

CO:4 K:2 7. Outline the confirmatory test in which Christmas Tree Stain is used

(a) Acid Phosphatase
(b) Alpha Amylase
(c) Creatinine
(d) Alkaline Phosphatase

CO:4 K:1 8. Choose the best storage condition for dried biological stains

(a) Room temperature in a sealed plastic bag
(b) Room temperature in a paper bag
(c) Frozen in a glass jar
(d) Submerged in ethanol

CO:5 K:1 9. Which technique is referred to as molecular photocopy

(a) RFLP
(b) PCR
(c) SNP
(d) Y - STR

CO:5 K:1 10. What does SNP stands for in DNA profiling

(a) Simple Nucleotide Protein
(b) Single Nucleotide Polymorphism
(c) Sequence Nucleotide Pair
(d) Single Neural Protein

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 250 words.

CO:1 K:4 11. (a) Distinguish between Affinity and Avidity

(OR)

(b) What is the composition of Human Blood. Write its function in detail.

CO:2 K:4 12. (a) Compare Preliminary and Confirmatory test for blood evidence

(OR)

(b) Explain the ABO system and analyze its role in individualization

CO:3 K:3 13. (a) A blood stain pattern has been observed in a murder case. Organize steps to help the investigator to collect and analyze the stain

(OR)

(b) Identify the importance of impact of angle, directionality, size and shape of blood stain

CO:4 K:3 14. (a) Identify the Presumptive and Confirmatory test for biological fluids.

(OR)

(b) Explain Vaginal fluids and identify its role in sexual assault cases

CO:5 K:4 15. (a) Analyze the role of DNA profiling mass disaster victim identification

(OR)

(b) Examine how mitochondrial DNA used in estimation of ancient skeletal remains

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 500 words.

CO:1 K:5 16. (a) Explain how Antigen- Antibody Binding occurs in human body?

(OR)

(b) Determine the significance of blood evidence in forensic science

CO:2 K:6 17. (a) Develop the mechanism of action and significance of Teichmann and Takayama crystal test in bloodstain analysis

(OR)

(b) Elaborate the steps involved in performing precipitin test and explain its significance in forensic science

CO:3 K:3 18. (a) Explain how documentation and photography for Blood Stain pattern Analysis can be utilized to solve a crime

(OR)

(b) Identify and explain the suitable methods to collect and analyze bloodstain on clothing and footwear

CO:4 K:4 19. (a) Discuss the composition of Semen and list out the steps involved in its forensic examination

(OR)

(b) List out the process involved in protection of biological evidences

CO:5 K:6 20. (a) Discuss the steps involved in PCR amplifications sequence polymorphism

(OR)

(b) Explain DNA typing systems and discuss their forensic importance