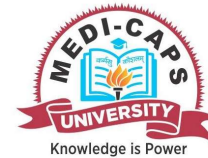


Total No. of Questions: 6

Total No. of Printed Pages: 3

Enrollment No.....



Faculty of Science  
End Sem (Even) Examination May-2022  
FS3SE03 Scientific Investigation  
Programme: B.Sc. (FS) Branch/Specialisation: Forensic Science

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. A bloodstain pattern which contains bubbles of oxygen and is lighter in colour than other patterns is formed by: **1**  
(a) Blunt force trauma wounds  
(b) Trail patterns formed by a running suspect  
(c) Blood diluted with bleach  
(d) Blood expired from the nose and mouth
- ii. The angle between two-foot lines is called as: **1**  
(a) Foot angle (b) Step angle  
(c) Walking angle (d) Angle width
- iii. The person was died at old age and due to disease, the cause of death would be- **1**  
(a) Natural (b) Accidental  
(c) Unnatural (d) None of these
- iv. Which stage resembles as rancid butter? **1**  
(a) Mummification (b) Algor mortis  
(c) Saponification (d) Putrefaction
- v. \_\_\_\_\_ are caused by vehicle which continues to move as the victim is hit. **1**  
(a) Secondary injury (b) Secondary impact injury  
(c) Impact injury (d) Abrasion

P.T.O.

[2]

- vi. Choose the correct sequence of injuries in road traffic accidents **1**  
 (a) Primary impact injury – Secondary injury – Secondary impact injury  
 (b) Primary injury – Secondary injury – Tertiary injury  
 (c) Primary impact injury – Secondary impact injury – Secondary injury  
 (d) Primary injury – Primary impact injury – Secondary injury
- vii. Explosion during fire due to the mixing of fresh air in a compartment having inflammable, volatile pyrolysis products & low oxygen is known as: **1**  
 (a) Flashback (b) Flame over  
 (c) Rollover (d) Dropdown
- viii. Sequence of process of arson is: **1**  
 (a) Open Combustion- Use of primary liquid-Ignition  
 (b) Ignition- Open Combustion- Use of primary liquid  
 (c) Open Combustion- Ignition- Use of primary liquid  
 (d) Use of primary liquid- Open Combustion- Ignition
- ix. The role of Taq polymerase during PCR reaction is- **1**  
 (a) Heat stable (b) Continuous heat supply  
 (c) Continuous cold supply (d) Forming bands
- x. In gang rape case the culprit can be identified using the- **1**  
 (a) Mt DNA profiling (b) Y-STR profiling  
 (c) D-Loop profiling (d) All of these
- Q.2 i. Describe glass fractures and their different types. **2**  
 ii. Write short notes on Gait line and step length. **3**  
 iii. How to Analyze Blood Stain Patterns? Explain the Tools Used in Blood Pattern analysis. **5**
- OR iv. Explain the different factors affecting gait pattern. **5**
- Q.3 i. Discuss the phenomenon of casper dictum. **2**  
 ii. Explain the different factors associated with post-mortem purge. **8**
- OR iii. How will you identify the different types of bones in a crime scene? Explain the types of death. **8**

[3]

- Q.4 i. Describe the different methods involved during a hit and run case investigation. **3**  
 ii. What is physical evidence? Explain the different methods of searching the crime scene. **7**
- OR iii. Explain the different methods used during theft investigation **7**
- Q.5 i. Explain the different methods involved in fire and arson investigation. **4**  
 ii. Define Explosion and Deflagration. Give a detailed account of investigation of an explosion scene. **6**
- OR iii. What are IEDs? Mention its types along with its forensic examination in detail. **6**
- Q.6 Attempt any two:  
 i. What are the equipment's needed for investigation, documentation and collection of evidences from the explosive crime scene? **5**  
 ii. How the STR markers are useful in sexual offence cases? What is the minimal set of STRs required for the examination? **5**  
 iii. What are autosomal DNA markers and the usage of these markers in child swapping cases? **5**

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## Marking Scheme FS3SE03 Scientific Investigation

Q.1	i.	A bloodstain pattern which contains bubbles of oxygen and is lighter in colour than other patterns is formed by:		1
		(d) Blood expired from the nose and mouth		
	ii.	The angle between two-foot lines is called as:		1
		(b) Step angle		
	iii.	The person was died at old age and due to disease, the cause of death would be-		1
		(a) Natural		
	iv.	Which stage resembles as rancid butter?		1
		(c) Saponification		
	v.	_____ are caused by vehicle which continues to move as the victim is hit.		1
		(b) Secondary impact injury		
	vi.	Choose the correct sequence of injuries in road traffic accidents		1
		(c) Primary impact injury – Secondary impact injury – Secondary injury		
	vii.	Explosion during fire due to the mixing of fresh air in a compartment having inflammable, volatile pyrolysis products & low oxygen is known as:		1
		(a) Flashback		
	viii.	Sequence of process of arson is:		1
		(d) Use of primary liquid- Open Combustion- Ignition		
	ix.	The role of Taq polymerase during PCR reaction is-		1
		(a) Heat stable		
	x.	In gang rape case the culprit can be identified using the-		1
		(b) Y-STR profiling		
Q.2	i.	Glass fractures and their different types	2 marks	2
	ii.	Gait line and step length	2 marks	3
		Direction Line	1 mark	
	iii.	Blood Stain Patterns	3 marks	5
		Tools Used in Blood Pattern analysis	2 marks	

OR	iv.	Definition of gait pattern	2 marks	5
		Different factors affecting gait pattern	3 marks	
Q.3	i.	Definition of Casper dictum and factors	2 marks	2
	ii.	Environment factors	2 marks	8
		Internal and External factors	3 marks	
		Stage of decomposition	3 marks	
OR	iii.	Different types of bones	5 marks	8
		Definition of death and types of death	3 marks	
Q.4	i.	Methods involved during a hit and run case investigation		3
		As per explanation	3 marks	
	ii.	Definition and types of physical evidence	2 marks	7
		Diagram of crime scene searching methods	2 marks	
OR	iii.	Different method of searching the crime scene	3 marks	7
		Definition of crime scene investigation	2 marks	
		Different methods used during theft investigation	5 marks	
Q.5	i.	Definition of arson investigation	1 mark	4
		Technical methods involved used for fire and arson investigation	3 marks	
	ii.	Definition of Explosion and Deflagration	2 marks	6
		Methods for investigation	4 marks	
OR	iii.	Definition and types of IEDs	3 marks	6
		Examination of IEDs	3 marks	
Q.6	Attempt any two:			
	i.	Investigation method in Arson case	2 marks	5
		Documentation and collection of Arson case	3 marks	
	ii.	Uses and types of STR in sexual offence cases	3 marks	5
		Set of STRs and their uses	2 marks	
	iii.	Definition and types of DNA markers	3 marks	5
		Usage in child swapping cases	2 marks	

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