Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Science
End Sem Examination Dec 2024
FS3EL07 Forensic Serology

Programme: B.Sc. (Hons.) 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. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	Who is the father of serology? (a) Arthur Murant (b) Karl Landsteiner (c) Edward Genner (d) Both (a) and (b)	**1**	1	1	1	3
	ii.	Blood stain cloth which is collected from the crime scene should be sent for examination? (a) As such without drying (b) After drying in sun and seal at in plastic beg (c) After drying in the shed at room temperature (d) After drying in the sun	**1**	1	1	1	3
	iii.	Which instrument is used in CLIA? (a) Luminar (b) Laminar (c) Luminometer (d) None of these	**1**	1	1	2	3
	iv.	Which protein is used in Complement fixation techniques? (a) C1 to C9 (b) C10 to C12 (c) Both (a) and (b) (d) None of these	**1**	1	1	2	3
	v.	What is the chromosome location of lewis blood group? (a) 19p13.3 (b) 19q13.3 (c) Both (a) and (b) (d) 24p28.1	**1**	1	1	3	3
	vi.	The rh antigen is discovered by which of the following scientist? (a) Karl Landsteiner (b) Alexander Weiner (c) Both (a) and (b) (d) None of these	**1**	1	1	3	3

P.T.O.

vii.	Which is the type of ELISA? (a) Direct ELISA (b) Indirect ELISA (c) Sandwich ELISA (d) All of these	**1**	1	1	4	3
viii.	Outcherlony assay is also known as- (a) Double diffusion in one direction (b) Double diffusion in two directions (c) Radial diffusion (d) Single diffusion	**1**	1	1	4	3
ix.	What does the electrophoresis apparatus consist of? (a) Gel, buffer chamber and fire pack (b) Buffer chamber and electrophoresis unit (c) Electrophoresis unit and gel separator (d) Power pack and electrophoresis unit	**1**	1	1	5	3
x.	What is rate-zonal centrifugation? (a) Based on separation of particles by mass (b) Based on separation of particles by density (c) Based on separation of particles on solubility (d) Based on separation of particles on size	**1**	2	1	5	3
Q.2	i. What are the different preservation method of blood found at the crime scene?	**2**	1	1	1	3
	ii. Illustrate in brief the applications of serology in forensics.	**3**	2	1	1	3
	iii. Discuss in detail about various types of body fluids, their composition and preliminary testing methods.	**5**	2	1	1	3
OR	iv. Describe the term forensic serology? What are scope of forensic serology demonstrate the role of hair as a forensic evidence?	**5**	3	1	1	3
Q.3	i. Define epitope and paratope with suitable diagram.	**2**	1	1	2	3
	ii. (a) Define is complement fixation test in details and its application and procedure (b) Define opsonin and write about opsonisation reaction with suitable diagram.	**8**	3	1	2	3

OR	iii. (a) Illustrate immunoflourosence and its types with suitable diagram and its application (b) Illustrate radio labelled immunoassay and its types with the help of suitable diagram and write about its application	**8**	2	1	2	3
Q.4	i. What is the difference between secreator and non secreator?	**3**	1	1	3	3
	ii. Write about the different methods of blood group typing with diagram.	**7**	1	1	3	3
OR	iii. Discuss about the different blood group system and their forensic significance.	**7**	3	1	3	3
Q.5	i. Explain about the immunoelectrophoresis and its application.	**4**	2	1	4	3
	ii. Discuss in detail about different agglutination reaction and its application with the help of the diagram.	**6**	2	1	4	3
OR	iii. Write in details about the precipitin binding assay and its application in forensic science.	**6**	3	1	4	3
Q.6	Attempt any two:					
	i. Give a brief account on centrifugation techniques and its types.	**5**	2	1	5	3
	ii. Write in detail about the SDS PAGE electrophoresis.	**5**	2	1	5	3
	iii. Differentiate between the following (a) Capillary electrophoresis and slab gel electrophoresis (b) Rate zonal and isopycnic centrifugation	**5**	4	1	5	3

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Marking Scheme
FS3EL07 (T) Forensic Serology (T)

Q.1	i)	d) both a and b	**1**
	ii)	c) after drying in the shed at room temperature	**1**
	iii)	c) luminometer	**1**
		One mark awarded to the student	
	iv)	a) C1 to C9	**1**
	v)	c) both a and b	**1**
	vi)	c) both a and b	**1**
	vii)	d) all of the above	**1**
	viii)	b) double diffusion in two direction	**1**
	ix)	d) Power pack and electrophoresis unit	**1**
	x)	d) Based on separation of particles on size	**1**
Q.2	i.	What are the different preservation method of blood found at the crime scene **2M**	**2**
	ii.	Illustrate in brief the applications of serology in forensics **3M**	**3**
	iii.	Discuss in detail about various types of body fluids, **2M** their composition and preliminary testing methods. **3M**	**5**
OR	iv.	Describe the term forensic serology? **1M** What are scope of forensic serology **2M** Demonstrate the role of hair as a forensic evidence **2M**	**5**
Q.3	i.	Define epitope and paratope with suitable diagram **2M**	**2**
	ii.	a) Define is Complement fixation test in details and **2M** its application and procedure **2M** b) Define opsonin and **2M** write about opsonisation reaction with suitable diagram **2M**	**8**
OR	iii.	a) illustrate immunofluorescence and **1M** its types **2M** with suitable diagram **1M** and its application **1M** b) illustrate radio labelled immunoassay **2M** and its types with the help of suitable diagram and write about its application **1M**	**8**
Q.4	i.	what is the difference between secreator and non secreator. **3M**	**3**
	ii.	Write about the different methods of blood group typing **6M** with diagram **1M**	**7**
OR	iii.	Discuss about the different blood group system **5M** and their forensic significance **2M**	**7**
Q.5	i.	Explain about the immunoelectrophoresis **3M** and its application **1M**	**4**
	ii.	Discuss in details about different agglutination reaction **4M** and its application with the help of the diagram **2M**	**6**
OR	iii.	Write in details about the precipitin binding assay and **5M** its application in forensic science **1M**	**6**
Q.6		Attempt any two:	
	i.	Give a brief account on centrifugation techniques and its types	**5**
	ii.	Write in details about the SDS PAGE electrophoresis.	**5**
	iii.	Differentiate between the following a) capillary electrophoresis and slab gel electrophoresis **2.5M** b) Rate zonal and isopycnic centrifugation **2.5M**	**5**

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