

Total No. of Questions: 6

Total No. of Printed Pages: 3

Enrollment No.....



Faculty of Science

End Sem Examination Dec 2024

FS3CO06 Technological Methods in Forensic Science

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. In chromatography, the stationary phase can be _____ supported on a solid. (a) Solid or liquid      (b) Liquid or gas (c) Solid only      (d) Liquid only	1	1	1	1	
ii. Which force is involved in the chromatography? (a) Hydrogen (b) London force (c) Electric Static force (d) All of these	1	1	1	1	
iii. In Atomic Absorption spectroscopy, which of the following is the generally used in radiation source? (a) Tungsten lamp (b) Xenon Mercury Arc Lamp (c) Hydrogen or deuterium discharge lamp (d) Hollow Cathode lamp	1	2	1	2	
iv. Selection the wavelength range corresponding to UV-visible region. (a) 400-800 nm      (b) 200-800 nm (c) 25 μm- 2.5 μm      (d) 2.5 μm- 1mm	1	2	3	3	
v. Raman lines are_____. (a) Weak      (b) Strong (c) Curvey      (d) Blurry	1	2	4	3	

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vi.	IR radiation sources-		<b>1</b>	2	3	3
	(a) Deuterium					
	(b) Mercury arc Lamp					
	(c) Incandescent lamp and Nernst Globar					
	(d) None of these					
vii.	Resolving power of microscope is a function of _____.		<b>1</b>	3	2	4
	(a) Wavelength of light used					
	(b) Numerical aperture of lens system					
	(c) Refractive index					
	(d) Wavelength of light used and numerical aperture of lens system					
viii.	Which of the following is used in electron microscope?		<b>1</b>	2	1	4
	(a) Electron beams					
	(b) Magnetic fields					
	(c) Light wave					
	(d) Electron beams and Magnetic field					
ix.	Which of the following centrifugation is used to separation certain organelles from whole cells?		<b>1</b>	2	1	5
	(a) Rate-Zonal centrifugation					
	(b) Normal centrifugation					
	(c) Differential centrifugation					
	(d) Iso pycnic centrifugation					
x.	At what speed do you centrifuge blood?		<b>1</b>	2	1	5
	(a) 2200-2500 RPM (b) 3000-3200 RPM					
	(c) 1000-1500 RPM (d) 4000 RPM					
Q.2	i. Give the principle of chromatography and name few types of chromatographic techniques.		<b>2</b>	2	1	1
	ii. How TLC plate is prepared and activated for analysis?		<b>3</b>	2	1	1
	iii. Explain about the high performance liquid chromatography with suitable diagram.		<b>5</b>	2	2	1
OR	iv. Give a brief note on gas chromatography.		<b>5</b>	2	2	1

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Q.3	i.	Draw the electromagnetic radiation spectrum on increasing frequency.	<b>2</b>	2	2	2
	ii.	Write in detail about uv-visible spectroscopy, its principle, flowchart and instrumentation with forensic applications.	<b>8</b>	3	1	2
OR	iii.	Write in detail about atomic absorption spectroscopy, its principle, flow chart and instrumentation with forensic applications.	<b>8</b>	2	1	2
Q.4	i.	Write down the different between Raman Spectroscopy and IR spectroscopy.	<b>3</b>	3	2	3
	ii.	Write in detail about Raman spectroscopy, its principle, flow chart, and instrumentation with forensic applications.	<b>7</b>	3	2	3
OR	iii.	Elaborate IR spectroscopy, its principle, flowchart, and instrumentation with forensic applications.	<b>7</b>	3	2	3
Q.5	i.	Write forensic application of polarizing microscope.	<b>4</b>	2	2	4
	ii.	Draw scanning electron microscopy with principle, its instrumentation and forensic application.	<b>6</b>	3	2	4
OR	iii.	Draw transmission electron microscopy with principle, its instrumentation and forensic application.	<b>6</b>	3	2	4
Q.6	Attempt any two:					
	i.	Give principle of sedimentation and analytical centrifugation.	<b>5</b>	2	3	5
	ii.	Write in detail about density gradient centrifugation technique.	<b>5</b>	2	3	5
	iii.	Differentiate between preparative centrifuge and ultra-centrifuge.	<b>5</b>	3	3	5

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### Marking Scheme

#### **FS3CO06 (T) Technological Methods in Forensic science (T)**

<b>Marking Scheme</b>		
<b>FS3CO06 (T) Technological Methods in Forensic science (T)</b>		
Q.1	i) a) Solid or liquid ii) d) All of these iii) d) Hollow Cathode lamp iv) b) 200-800nm v) a) Weak vi) c) Incandescent lamp and Nernst Globar vii) d) Wavelength of light used and numerical aperture of lens system viii) d) Electron beams and Magnetic field ix) c) Differential Centrifugation x) a) 2200-2500RPM	1 1 1 1 1 1 1 1 1 1
		OR     iii. AAS spectroscopy <b>1 mark</b> Its principle- <b>2 marks</b> Flowchart- <b>1 marks</b> Instrumentation- <b>2 marks</b> Forensic applications- <b>2 marks</b>
		Q.4    i. 5 difference points of IR & Raman spectroscopy <b>4 Marks</b> ii. Raman spectroscopy its principle - <b>2 marks</b> flowchart- <b>1 marks</b> Instrumentation- <b>2 marks</b> Forensic applications- <b>2 marks</b>
		OR     iii. IR its principle- <b>2 marks</b> Flowchart- <b>1 marks</b> Instrumentation- <b>2 marks</b> Forensic applications- <b>2 marks</b>
		Q.5    i. 5 points forensic application of polarizing microscope. <b>4</b> ii. Diagram of Scanning electron microscopy <b>2 marks</b> Instrumentation- <b>2 marks</b> Forensic applications- <b>2 marks</b>
		OR     iii. Diagram of transmission electron microscopy <b>2 marks</b> Instrumentation- <b>2 marks</b> Forensic applications- <b>2 marks</b>
		Q.6     i. Give principle of sedimentation <b>2.5 marks</b> and analytical centrifugation <b>2.5 marks</b> ii. Gradient centrifugation technique <b>5</b> iii. Differentiate (any five differences) <b>5</b>
Q.3	i. Chart of .....frequency- <b>2 marks</b> ii. About uv-visible spectroscopy - <b>1 mark</b> Its principle- <b>2 marks</b> Flowchart- <b>1 marks</b>	2 8
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