


Name:			
Enrolment No:			
UPES End Semester Examination, May 2024			
Course: Instrumentation in Microbiology Program: INT_BMSC_N_D Course Code: HSMB30110		Semester : VI Duration : 3 Hours Max. Marks: 100	
Instructions: Attempt all questions as directed in each section.			
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q1	Which component of a disc bowl centrifuge is responsible for generating centrifugal force? a) Rotor b) Bowl c) Motor d) Control panel	1.5	CO2
Q2	In which of the following industries is centrifugation commonly used? a) Pharmaceutical b) Automotive c) Textile d) Construction	1.5	CO2
Q3	What is the major advantage of using a disc bowl centrifuge over other separation methods? a) Higher throughput b) Lower energy consumption c) Greater versatility d) Faster separation times	1.5	CO2+1
Q4	Which component of a mixture settles at the bottom of the centrifuge tube during centrifugation? a) Lightest component b) Heaviest component c) Component with the highest solubility d) Component with the lowest density	1.5	CO2
Q5	What is the purpose of using a centrifuge? a) To mix components of a solution b) To separate components of a mixture based on density differences c) To accelerate chemical reactions d) To measure the viscosity of a liquid	1.5	CO2+1
Q6	In paper chromatography, what is the mobile phase typically made of?	1.5	CO3

	<ul style="list-style-type: none"> a) Liquid b) Gas c) Solid d) Gel 		
Q7	<p>Which type of material is most suitable for the construction of disc bowl centrifuge components due to its resistance to corrosion and high strength?</p> <ul style="list-style-type: none"> a) Stainless steel b) Aluminum c) Copper d) Plastic 	1.5	CO3
Q8	<p>What is the primary advantage of a compound microscope over a simple microscope?</p> <ul style="list-style-type: none"> a) Higher magnification b) Smaller size c) Easier portability d) Lower cost 	1.5	CO4
Q9	<p>What property of the sample molecules primarily determines their movement through the paper in paper chromatography?</p> <ul style="list-style-type: none"> a) Size b) Density c) Solubility d) Color 	1.5	CO4
Q10	<p>In paper chromatography, what is the stationary phase?</p> <ul style="list-style-type: none"> a) Paper b) Solvent c) Sample d) Mobile phase 	1.5	CO3
Q11	<p>What is the main purpose of agarose gel electrophoresis?</p> <ul style="list-style-type: none"> a) Separating proteins based on size b) Separating DNA molecules based on size c) Separating proteins based on charge d) Separating RNA molecules based on charge 	1.5	CO3+4
Q12	<p>Which of the following is true about the gel used in SDS-PAGE?</p> <ul style="list-style-type: none"> a) It is made of agarose b) It is made of cellulose c) It is made of polyacrylamide d) It is made of starch 	1.5	CO4
Q13	<p>Which of the following best describes a simple microscope?</p> <ul style="list-style-type: none"> a) It has a single lens system. b) It has multiple lens systems. c) It uses advanced digital imaging technology. d) It is only used for observing living organisms. 	1.5	CO3
Q14	<p>Which component is present in a compound microscope but not in a simple microscope?</p> <ul style="list-style-type: none"> a) Eyepiece b) Objective lens 	1.5	CO3

	c) Stage d) Condenser		
Q15	What is agarose? a) A type of protein b) A type of carbohydrate c) A type of lipid d) A type of buffer	1.5	CO1+4
Q16	In agarose gel electrophoresis, DNA molecules move through the gel in response to: a) Gravitational force b) Magnetic force c) Centrifugal force d) Electric field	1.5	CO4
Q17	Which property of agarose makes it suitable for gel electrophoresis? a) Its ability to bind to DNA molecules b) Its ability to form a solid gel when cooled c) Its ability to conduct electricity d) Its ability to fluoresce under UV light	1.5	CO3+4
Q18	In the context of Indian cuisine, which cooking method aligns best with the principles of the DASH diet? a) Deep-frying b) Stir-frying c) Grilling d) Butter roasting	1.5	CO1
Q19	Which scientist is known for his improvement of the compound microscope and his detailed observations of microorganisms? a) Louis Pasteur b) Robert Koch c) Joseph Lister d) Antonie van Leeuwenhoek	1.5	CO1
Q20	Which end of the gel serves as the starting point for DNA migration during agarose gel electrophoresis? a) Cathode b) Anode c) Both ends d) It depends on the charge of the DNA	1.5	CO2+1
Section B (4Qx5M=20 Marks)			
Q 1	Define gel electrophoresis principle and application.	5	CO2+3
Q2	Describe the importance of SDS in SDS-PAGE.	5	CO4
Q3	Draw a paper chromatography and label both mobile and stationary phase.	5	CO3
Q4	Outline a simple schematic picture of basket and tubular centrifuge.	5	CO1+2
Section C (2Qx15M=30 Marks)			

Q 1	Write down the principle of spectrophotometer. Create basic diagram and give one example that you have observed previously.	15	CO3
Q2	What are the practical uses of centrifugation in the food industry? Differences between disc bowl and decanter centrifuges?	15	CO3+2
Section D (2Qx10M=20 Marks)			
Q 1	Draw schematic representations for both agarose gel electrophoresis and SDS-PAGE.	10	CO4+2
Q2	Distinguish features between a simple microscope versus a compound microscope. Furthermore, how does the utilization of microscopes benefit the food industry?	10	CO1+3