


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, December 2022			
Course: Biosafety and Aseptic Techniques		Semester: Ist	
Program: M. Sc (Microbiology)		Time : 03 hrs.	
Course Code: HSMB 7024		Max. Marks: 100	
Instructions:			
Q.No	Section A MCQs/Short answer questions/True &False	(20x1.5= 30 Marks)	COs
Q	Statement of question (each question carries 1.5 marks)		CO
1.	____ is a well-defined area where the production of sterile preparation should be carried out. a) Compounding area b) Manufacturing area c) Aseptic area d) Quarantine area	1.5	CO1
2.	Laminar airflow allows ____ movement of air. a) Unidirectional b) Nonunidirectional c) Combined d) Multidirectional	1.5	CO1
3.	Laminar airflow unit uses ____ filters. a) Candle b) Millipore c) Seitz d) HEPA	1.5	CO1
4.	The full form of HEPA filter is? a) High-efficiency particulate air b) High effective particulate air c) High effective particles in the air d) High efficiency of particles in air	1.5	CO2
5.	What is the correct order of staining reagents in Gram-Staining? a) Crystal violet, alcohol, iodine solution, safranin b) Crystal violet, iodine solution, alcohol, safranin c) Crystal violet, safranin, alcohol, iodine solution d) Iodine solution, crystal violet, alcohol, safranin	1.5	CO2
6.	What is Dye exclusion method of staining? Explain with example.	1.5	CO3

7.	Which of the following is the example of Gram-negative bacteria? a) Lactobacillus b) Escherichia coli c) Staphylococcus aureus d) Bacillus subtilis	1.5	CO2
8.	Write the full form of BMBL. State the significance of the document in the practice of biosafety.	1.5	CO2
9.	Define Laboratory-Associated Infections with relevant reported examples.	1.5	CO3
10.	Write the full form of IBSC. Discuss the role of IBSC committee in risk assessment review.	1.5	CO3
11.	Give full names of global organizations: CDC and NIH	1.5	CO2
12.	What is a GMO? Explain with relevant example for the same.	1.5	CO3
13.	Compare between an upright and inverted microscope in terms of accessibility to work with sample.	1.5	CO2
14.	Write full names for : a) ICMR b) DBT c) CSIR	1.5	CO3
15.	State True or False: "An effective culture of safety depends on the effective communication and reporting of risk indicators, including incidents and near misses, in a non-punitive manner"	1.5	CO4
16.	What is the criteria of classification of Biosafety levels?	1.5	CO4
17.	Name three microorganisms (or viruses) that require BSL3 facility for experimentation.	1.5	CO3
18.	How does BSL2 facility differ from BSL1 set up?	1.5	CO4
19.	What is the full form of BSC? What are they used for?	1.5	CO4
20.	Describe the contents of a safety manual?	1.5	CO3
	Section B	(4x5=20 Marks)	CO
Q	Statement of question (each question carries 5 marks)		
1.	a) What is an endospore in a bacteria? Discuss the significance of bacterial endospore? b) What staining method would you use to identify a bacteria with an endospore?	3+2	CO1

2.	<p>a) There are four biosafety levels that are implemented and defined by the CDC. Discuss these levels in terms of agent containment and facility safeguards</p> <p>b) Give the pyramidic representation of BSLs. Label the diagram.</p>	4+1	CO2
3.	<p>Discuss the following with relevance to BSL3</p> <p>a) Standard Microbiological practices</p> <p>b) Special practices</p>	3+2	CO3
4.	<p>a) What is an IPM?</p> <p>b) Why an effective IPM needs to be implemented in BSL facility</p>	2+3	CO4
Section C		(2x15=30 Marks)	
Q	Statement of question (Case studies) (each question carries 15 marks)		CO
1.	<p>In 1884 the Danish bacteriologist Christian Gram developed a staining technique that separates bacteria into two groups:</p> <p>a) Name the two groups. Give two examples for each group.</p> <p>b) Mention the principle on the basis of which the two groups are differentiated.</p> <p>c) Give the names of reagents used in this staining as:</p> <p>i) Primary Stain,</p> <p>ii) Mordant,</p> <p>iii) Decolorizer,</p> <p>iv) Counter stain</p> <p>d). State the applications of following stains used in microbiological experiments:</p> <p>i) Acridine Orange</p> <p>ii) Coomassie brilliant blue</p>	15 (4+3+4+4)	CO1
2.	<p>The process by which the appropriate selection of practices and safeguards, respective of the agents being studied in lab are implemented to prevent laboratory associated infections constitute the basic pillar of Biosafety level.</p> <p>a) What is this process called? Discuss the basic parameters that are considered during this process?</p> <p>b) Discuss the role of HEPA filter in Biosafety Cabinet.</p> <p>c) Compare between BSC- Class I, II, and III with respect to applications and airflow pattern.</p>	15 (5+5+5)	CO3
Section D		(2x10=20 Marks)	
Q	Statement of question (each question carries 10 marks)		CO
1.	<p>a) Discuss the roles and responsibilities of a Biosafety Officer.</p> <p>b) Discuss the laboratory facilities (or secondary barriers) in BSL2</p>	5+5	CO2

2.	a) What is bioterrorism? Explain with examples the, three categories into which the bio-terrorism agents have been classified? b) Discuss Bioterrorism threat and Bioterrorism preparedness in Indian scenario.	5+5	CO4
----	--	-----	-----