Question Paper Format

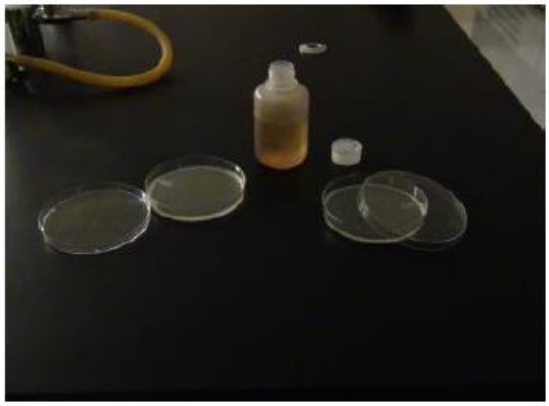
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Biosafety and Aseptic Techniques
Semester: I
Program: MSC-MICROBIOLOGY
Duration: 03 hrs.
Course Code: HSMB7024 Max. Marks: 100
Instructions: Attempt all questions

Q.No	Section A (Type the answers in test box)	20Qx1.5M=30Marks	COs
Q1	Application of knowledge, techniques, and equipment to protect scientific workers, the public, and the environment from accidental exposure to infectious agents and other biohazards is ___ (a). Biosafety (b). Biosecurity (c). Biorisk (d). Biohazard		CO1
Q2	The safekeeping and prevention of unauthorized access to dangerous pathogens and toxins, as well as microbial strains and biological materials of value is ___ (a). Biosafety (b). Biosecurity (c). Biorisk (d). Biohazard		CO5
Q3	Biosafety principles guide the conditions for _____; that is, the methods and equipment for safe manipulation of infectious agents in a laboratory. (a). Access (b). Containment (c). Physical protection (d). All of the above		CO4
Q4	Both biosafety and biosecurity measures seek to minimize risk. When conducting research on pathogenic agents for peaceful purposes, it is necessary to establish what constitutes a(n) _____ level of risk. (a). Acceptable (b). Intolerable (c). High (d). None of the above		CO1
Q5	When identifying risk and addressing hazards, the goal is to provide the highest practical _____ and the lowest practical _____. (a). resistance / virulence (b). attenuation / pathogenicity (c). protection / exposure (d). None of the above		CO4

<table>
<tr><td>Q6</td><td>Match the following<table><tr><td>Part A</td><td>Part B</td></tr><tr><td>(a). Pathogen
(b). Formulation
(c). Munition</td><td>(1). chemical mixed with pathogens; may be “wet” or “dry”
(2). the active ingredient of the system
(3). usually, sprayer or atomizer for creating aerosol
(4). protects the formulated pathogen during transport and storage</td></tr></table></td><td>CO4</td></tr>
<tr><td>Q7</td><td>Which of the following are considered ideal biological weapons agents and subject to biosecurity measures?
(a). Bacillus anthracis (anthrax)
(b). Yersinia pestis (plague)
(c). Clostridium tetani (tetanus)
(d). Both (a) and (b)</td><td>CO5</td></tr>
<tr><td>Q8</td><td>Which of the following are the most likely ways that terrorists could acquire biological agents?
(a). burglarize low-security laboratories
(b). acquire select agents such as anthrax from natural sources
(c). collaborate with a laboratory employee
(d). All of the above</td><td>CO5</td></tr>
<tr><td>Q9</td><td>Read the statements given below carefully:
(1). disperse an aerosolized bacteria or toxin
(2). sabotage the food industry with a pathogen or toxin
(3). contaminate food or beverages with pathogens or toxins
(4). disperse an aerosolized virus
Place the following in order from easiest to most difficult:
(a.) (3)-(2)-(1)-(4)
(b). (3)-(2)-(4)-(1)
(c). (3)-(4)-(2)-(1)
(d). (3)-(1)-(2)-(4)</td><td>CO2</td></tr>
<tr><td>Q10</td><td>Choose the best option for the blank in this sentence:
The special equipment needed for a biological weapons capability is _____, being also widely employed in industry and science, and is therefore difficult to regulate and control.
(a). dual use
(b). technical
(c). weaponized</td><td>CO3</td></tr>
<tr><td>Q11</td><td>Which of the following is considered a very worrisome bioweapon because it is easy to acquire, easy to work with, and highly toxic?
(a). Anthrax
(b). Botulinum toxin
(c). Ricin
(d). None of the above</td><td>CO5</td></tr>
<tr><td>Q12</td><td>Match the following<table><tr><td>Part A</td><td>Part B</td></tr><tr><td>(a). Lowest risk
(b). Medium risk
(c). Highest risk</td><td>(1). Small outsider groups attack facility
(2). Terrorist commando assault
(3). Insider or outsider attempts to steal select agents
(4). Insider or outsider attempts to steal information</td></tr></table></td><td>CO3</td></tr>
<tr><td>Q13</td><td>To prevent the contamination of microscopes and surrounding areas disinfect/clean used slides, prepared by student, with
(a). 70% ethanol and lens paper
(b). 5% methylene blue and lens paper
(c). acetone and lens paper</td><td>CO1</td></tr>
</table>

	(d). water and lens paper	
Q14	_____ is needed as a source of nutrient for the growth and reproduction of microbes. (a). pathogens (b). bacteria (c). reagents (d). media	CO1
Q15	After a biohazard spill is covered with paper towels and disinfectant solution, it must sit for _____ minutes? (a). 5 (b). 30 (c). 60 (d). 20	CO3
Q16	What is the name of the procedure performed under sterile conditions to eliminate contamination in hopes to obtain a pure culture of one type of microorganism? (a). sterilization technique (b). aseptic technique (c). disinfectant technique (d). pathogen technique	CO1
Q17	Good work practices include, (a). smelling and tasting chemicals (b). not washing hands before and after lab (c). confining long hair and loose clothing (d). using damaged equipment and glassware	CO2
Q18	Chemical, reagents or broth cultures should be pipetted by _____? (a). mouth (b). ear (c). pipetter (d). nose	CO4
Q19	Read the statements given below carefully: (1). Food and drinks are allowed in the lab (2). Lab coats much be taken off when exiting the lab and entering a non-laboratory area (3). Good Laboratory Practice (GLP) is a method employed in a laboratory setting to prevent contamination, accidents and injuries State true or false (a). False, true, true (b). False, false, true (c). True, false, true (d). False, true, false	CO4
Q20	When a chemical splashes in the eye rinse for _____? (a). 10 seconds (b). 30 seconds (c). 5 minutes (d). 15 minutes	CO2
Q.No	**Section B (Scan and upload)** **4Qx5M= 20 Marks**	
Q1	Observe the images carefully and answer the questions within one sentence- (a). Identify one safety violation in the picture.	CO1

	 (b). The sign below indicates what type of safety hazard?  (c). The sign below indicates what type of safety hazard?  (d). Identify one safety violation in the picture. 	
Q2	What is bioterrorism? Provide overview of the major microorganisms that have been utilized or studied for biowarfare.	CO5

Q3	Best laboratory practices to follow along with safety equipment's when handling hazardous biological agents belonging to various risk levels.		CO4
Q4	Explain in brief about importance of biosafety regulation. State various elements of biosafety program and regulatory bodies involved in biosafety regulation.		CO3
Q.No	**Section C (Scan and upload)**	**2Qx15M=30 Marks**	
Q1	What are biosafety cabinets? Discuss their types with neat, labelled diagrams along with their applications in detail.		CO1
Q2	What is biorisk assessment? How one can carry out this assessment and what is it's need? Classify the infective microorganisms based on risk groups and their relation to the biosafety levels.		CO2
Q.No	**Section D (Scan and upload)**	**2Qx10M= 20 Marks**	
Q1	What do you mean by the term sterilization? Discuss in detail various types of sterilization techniques along with their advantages.		CO4
Q2	What are bioaerosols? Provide an overview of medical conditions related to indoor air quality issues along with associated microorganisms and biological materials.		CO5