

CBCS SCHEME

BBT358A

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Question Paper Version : A

Third Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024
Bio-Lab Management and Risk Assessment

Time: 1 hrs.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

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1. What is the primary purpose of a Laboratory Information Management System (LIMS) in a bio-laboratory?
a) Data analysis
b) sample tracking and management
c) Equipment calibration
d) personnel training-
 2. What does the term "ergonomics" refer to in the context of lab layout?
a) Efficient use of space
b) Design for human comfort and efficiency
c) Placement of equipment
d) Cost effective solutions
 3. How does a centralized inventory management system benefit a laboratory?
a) It increase the chances of misplacing items
b) It reduces control over inventory
c) It enhances visibility and control over inventory
d) It promotes random usage of supplies
 4. What role does IoT (Internet of Things) play in biolab automation?
a) It has no application in biolab management
b) Enabling real time monitoring and control of equipment
c) Slowing down communication among devices
d) Increasing manual interventions
 5. What is the purpose of a Standard Operating Procedure (SOP) in laboratory documentation?
a) To complicate experimental procedures
b) To provide a step – by – step guide for consistent and standardized practices
c) To entertain researchers during experiments
d) To save paper

6. What does the acronym PPE stand for in the context of laboratory safety?
 - a) Public Protection Equipment
 - b) Personal Protective Equipment
 - c) Professional Protection Essential
 - d) Laboratory Safety Gear
7. Which organization provides guidelines for Biosafety Levels?
 - a) WHO (World Health Organization)
 - b) NASA (National Aeronautics and Space Administration)
 - c) CDC (Centre for Disease Control and Prevention)
 - d) FDA (Food and Drug Administration)
8. Why is it essential to document experimental procedures thoroughly?
 - a) To impress colleges and supervisors
 - b) To comply with paperwork requirement
 - c) To ensure reproducibility and transparency
 - d) To save time in the long run
9. What does the term "inventory management" refer to in the context of biolab storage?
 - a) Arranging equipment in alphabetical order
 - b) Tracking and managing the stock of laboratory material
 - c) Decorating the laboratory shelves
 - d) labeling storage units with creative names
10. Which organization or agency typically regulates the disposal of hazardous waste from biolab?
 - a) Environmental Protection Agency (EPA)
 - b) Food and Drug Administration (FDA)
 - c) Occupational Safety and Health Administration (OSHA)
 - d) National Aeronautics and Space Administration (NASA)
11. How is risk typically calculated in risk assessment?
 - a) Probability multiplied by uncertainty
 - b) Severity multiplied by exposure
 - c) Probability multiplied by consequence
 - d) Certainty divided by impact
12. What is a hazard?
 - a) The likelihood of an event occurring
 - b) The potential for harm or adverse health effect
 - c) The combination of likelihood and consequence
 - d) The overall impact of a risk event
13. What is the different between qualitative and quantitative risk assessment?
 - a) Qualitative assesses likelihood, while quantitative assesses impact
 - b) Qualitative uses numerical values, while quantitative uses descriptive terms
 - c) Qualitative is more precise than quantitative
 - d) There is no difference.
14. When conducting a risk assessment, what does the term "mitigation" mean?
 - a) Increasing the severity of identified risks
 - b) Ignoring potential hazards
 - c) Implementing measures to reduce or eliminate risks
 - d) Enhancing the complexity of experiments

15. In the hierarchy of risk control measures, which is generally considered the last resort?
- Elimination
 - Substitution
 - Engineering controls
 - Personal Protective Equipment (PPE)
16. What is the primary purpose of a risk review in the context of risk assessment?
- Identifying new risks
 - Evaluating the effectiveness of risk mitigation measures
 - Updating risk assessment documentation
 - All of the above
17. Which risk management tool is effective for assessing the impact of multiple variables on the overall risk of a project through statistical modeling?
- Fault Tree analysis
 - Monte Carlo Simulation
 - Risk Heat Map
 - FMEA (Failure Mode and Effect Analysis)
18. Which of the following is the first principle of HACCP?
- Conduct a hazard analysis
 - Establish critical control points
 - Implement correction actions
 - Establish monitoring procedures
19. In risk assessment, what does the term "risk filtering" refer to?
- Removing all identified risks
 - Prioritizing risks based on their likelihood
 - Assessing the severity of risks
 - Discarding insignificant risks to focus on the most relevant ones
20. A pharmaceutical company is conducting research on a new drug. What is potential risk that should be assessed in this case?
- Supplier reputation
 - Market competition
 - Adverse effects of the new drug
 - Employee turnover
21. What does the term "probability of occurrence represent in risk assessment?
- The impact of a risk event
 - The likelihood that a risk event will happen
 - The cost associated with a risk event
 - The timeframe within which a risk event may occur
22. What is the recommended personal protection equipment (PPE) in a BSL – 2 laboratory?
- Lab coat and gloves
 - Respirator and full body suit
 - Face shield and boots
 - Space Suit
23. Which of the following BSL is recommended for the handling of samples suspected of mycobacterium tuberculosis?
- BSL – 1
 - BSL – 2
 - BSL – 3
 - BSL – 4
24. Which type of filter is commonly used in BSCs to capture and remove airborne particles?
- Carbon filter
 - Electrostatic filter
 - Glass Fiber filter
 - HEPA filter
25. Specimens of Ebola and Marburg virus for cell culture identification should be handled in which of the following BSL.
- BSL – 1
 - BSL – 2
 - BSL – 3
 - BSL – 4

26. Which of the following is a safety concern when using genetically engineered microorganisms in industrial processes?
- Enhanced productivity
 - Reduced waste generation
 - Potential escape and spread in the environment
 - Higher protein production
27. What is a primary concern regarding the use of biotechnology in agriculture?
- Decreased crop yield
 - Increased dependence on chemical fertilizer
 - Potential development of resistant pests and weeds
 - Improved food quality
28. Which International organization is responsible for providing guidance on biosafety biosecurity?
- WHO (World Health Organization)
 - UNICEF (United Nations International Children's Emergency Fund)
 - UNESCO (United Nations Educational, Scientific and Cultural Organization)
 - WTO (World Trade Organization)
29. The Cartagena Protocol on Biosafety primarily deals with :
- Food safety
 - Animal welfare
 - Environmental Risk associated with genetically modified organisms (GMOs)
 - Human health regulations
30. Which biosafety level is appropriate for work involving agents that pose a moderate risk to humans and the environment, with potential for spread in the community but with available treatments?
- BSL - 1
 - BSL - 2
 - BSL - 3
 - BSL - 4
31. What is the primary purpose of a risk assessment for infectious organisms?
- To determine the organisms' favorite environment
 - To identify potential hazards and evaluate the likelihood of their occurrence
 - To classify organisms based on their size
 - To create new infectious organisms
32. What is the primary purpose of a safety assessment for infectious agents?
- To promote economic growth
 - To ensure public safety
 - To facilitate international trade
 - To encourage research collaboration
33. Which of the following is a key consideration in assessing the safety of genetically engineered microbes?
- Economic feasibility
 - Speed of microbial growth
 - Environmental impact
 - Commercial potential
34. What role does the "substantial equipment" concept play in the safety assessment of transgenic plants?
- It is irrelevant to safety assessment
 - It is used to compare transgenic plants to non genetically modified counterparts
 - It measures the potential yield of transgenic crops
 - It assesses the color and appearance of transgenic plants

35. How can genetically modified microorganisms be employed in bioremediation?
- To increase soil fertility
 - To enhance water taste
 - To breakdown pollutants and contaminants
 - To improve air quality
36. Which phase involves determining the potential impacts of identified risks?
- Risk identification
 - Risk analysis
 - Risk evaluation
 - Risk treatment
37. What is the primary goal of assessing familiarity in the context of product evaluation?
- To identify unique features
 - Similar function and safety profile
 - Exclusive patent protection
 - Revolutionary breakthrough
38. What is the primary goal of Environmental Risk Assessment (ERA)?
- To maximize economic profile
 - To minimize environmental regulations
 - To assess and manage potential risks to the environment
 - To promote industrial growth without considering environmental impacts
39. What does the acronym HACCP stand for in the context of food safety?
- Hazard Analysis and critical control points
 - High-Altitude cooking and cooling process
 - Healthy and controlled culinary practices
 - Hazardous and contaminated cooking procedure
40. A pharmaceutical company is developing a new vaccine using a live attenuated virus. What is potential risk associated with this approach?
- Reduced effectiveness of the vaccine
 - unintended spread of the attenuated virus
 - Rapid mutation of the virus
 - Lower production cost
41. What is the primary goals of risk assessment using omics approaches?
- Identify individual genes
 - Evaluate the overall health of an organism
 - Measure protein concentration only
 - Examine non-genetic factors exclusively
42. What is the role of transcriptomics in risk assessment?
- Assessing genetic variations
 - Measuring variations in gene expression
 - Analyzing protein – protein interactions
 - Studying metabolic pathways
43. Which omics technique is suitable for studying the entire set of proteins produced by an organism?
- Genomics
 - Transcriptomics
 - Proteomics
 - Metabolomics
44. What is the primary ethical concern related to health privacy?
- Profitability
 - Autonomy and confidentiality
 - Efficiency
 - Publicity

45. What is a major ethical concern related to the use of AI in healthcare data analysis?
- a) Improved accuracy
 - b) Enhanced privacy
 - c) Bias and discrimination
 - d) Cost – effectiveness
46. The Environmental Impact Assessment (EIA) process in India is governed by which regulatory body?
- a) Ministry of Environment, Forest and climate change
 - b) National Green Tribunal
 - c) Central Pollution Control Board
 - d) Bureau of Indian Standards
47. Which of the following is an example of a qualitative risk characterization method?
- a) Monte Carlo Simulation
 - b) Decision Trees
 - c) Risk Matrix
 - d) Sensitivity Analysis
48. What is the key difference between risk mitigation and risk acceptance?
- a) Risk mitigation focuses on reducing the impact, while risk acceptance acknowledge the risk without taking action
 - b) Risk acceptance is a more aggressive strategy than risk mitigation
 - c) Risk mitigation only applies to high priority risks, while risk acceptance applies to all risks
 - d) Risk acceptance involves transferring the risk, while risk mitigation involves minimizing the impact.
49. In a biological laboratory handling infectious agents, what is the primary goal of implementing strict access control measures?
- a) To increase collaboration among researchers
 - b) To reduce the risk of unauthorized access to sensitive materials
 - c) To expedite the entry and exit of personnel
 - d) To minimize noise within the laboratory
50. A biolab is conducting experiments involving Genetically Modified Organisms (GMOs). What risk mitigation strategy should be prioritized to prevent unintentional release into environment?
- a) Regular training on proper handling and containment procedures
 - b) Increasing public awareness about GMO research
 - c) Storing GMOs in open containers for easy monitoring
 - d) Utilizing GMOs in outdoor experiments to reduce indoor risks
