



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR:

DEGREE

AML 4251 : BIOSAFETY AND BIOSECURITY

END OF SEMESTER EXAMINATION

SERIES: Select series 2017

TIME: 3 HOURS

DATE: Pick Date Sep 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **TWO** Section(s). Attempt ALL questions.

Circle the correct answer in section A.

Section A

1. Bleeding of animals for blood which is used in preparation of blood agar media is carried out in

- a) ABSL-1
- b) ABSL-3
- c) The blood bank
- d) ABSL-1
- e) ABSL-2

2. Which one of the following is not eliminated by disinfection?
- a) Spores of *Bacillus subtilis*
 - b) Log phase cultures of Salmonella
 - c) Lipid coated viruses
 - d) *Candida albicans*
 - e) Vegetative cells of *Bacillus anthracis*
3. Which of the following statements is not correct on select agents?
- a) Agent can only cause opportunistic infection
 - b) Agent is threat to the public
 - c) Agent is virulent
 - d) Agent is registered with CDC
 - e) Agent is indicated in an inventory
4. Which one of the following is used to dispose contaminated syringes?
- a) Biohazard yellow bags
 - b) Re capping
 - c) Biohazard red bags
 - d) Puncture-resistant containers
 - e) Cool box
5. Which of the following is incorrect on the safety of working with genetically modified bacteria or GMOs?
- a) Risk assessment is carried on the donor cell only
 - b) Containment refers to protecting environment from GMOs
 - c) The risk levels can be classified
 - d) Wild strains of *Escherichia coli* are in risk level 2
 - e) Materials with non pathogenic mutants are sterilized before disposal

6. Laboratory acquired infection can be caused through ingestion by _____
- a) Mycobacterium
 - b) Salmonella
 - c) Working in BSL-3
 - d) Not wearing gloves
 - e) Using a pipette aid
7. Which of the following item in BSL-4 Biosafety cabinet system protects the environment from laboratory contamination?
- a) Incinerator
 - b) Fiber glass
 - c) Millipore filter
 - d) HEPA filter
 - e) Exhaust
8. The following are potential bioterrorist agents except _____
- a) Bacterial spores
 - b) Motile bacteria
 - c) Easy to culture organism
 - d) Fastidious organisms
 - e) Highly virulent organisms
9. Which one of the following organism produce the most potent toxin?
- a) *Staphylococcus aureus*
 - b) *Clostridium botulinum*
 - c) *Vibrio cholerae*
 - d) *Bacillus creus*
 - e) *Agaricus bisporus*

10. Material accountability procedures should be established to track the following except
- a) the inventory,
 - b) storage,
 - c) Use of organisms
 - d) Transfer of agents
 - e) Mode of transportation
11. SARS virus stored in liquid nitrogen can be traced by using the_____
- a) Manual for using liquid nitrogen
 - b) Biohazard incidents
 - c) Audit reports
 - d) Inventory
 - e) Equipment maintenance records
12. Lyophilized agents which can be used in bioterrorism attacks are in _____ form
- a) Semi-solid
 - b) Gaseous
 - c) Liquid
 - d) Concentrated suspension
 - e) Powder
13. Immunoprophylaxis is recommended against laboratory acquired infection if a technologist is _____
- a) Is working on preventable hemorrhagic virus
 - b) Pregnant
 - c) Is allergic to PPE
 - d) Newly discovered exotic agents
 - e) Recombinant microorganism

14. The following statements are correct about a select agent except _____
- a) It can be cultured in the laboratory
 - b) Could cause serious public threat
 - c) Can be fatal
 - d) Must be registered
 - e) It is mainly associated opportunistic infections
15. Intentional misuse of biological agents to create fear is referred to as _____
- a) Bioterrorism
 - b) Biosafety
 - c) Bioethics
 - d) Biosecurity
 - e) Biological theft
16. Which of the following is associated with the Biosecurity officer?
- a) Develop vaccines against highly infectious pathogens
 - b) Inspection and clearance of overseas ships
 - c) Collect tax from imported biological materials
 - d) Collect samples of patients with hemorrhagic fever
 - e) Monitor laboratory sterilization processes
17. In which one of the following laboratories is *Naegleria gruberi* handled?
- a) ABSL-3
 - b) BSL3
 - c) BSL-2
 - d) BSL-1
 - e) BSL4

18. Which one of the following experimental animals can cause vector borne laboratory acquired infections?
- a) Rabbit infected with fungi
 - b) Animal producing mycotoxin contaminated milk
 - c) Nude mice
 - d) Mice infected with *Yersinia pestis*
 - e) Animals in a cage contaminate with *Pseudomonas*
19. Which one of the following is the main challenge in the laboratory handling of prions
- a) Prions produce spores
 - b) Prions must be registered as a selected agent
 - c) Resist traditional sterilization techniques
 - d) Can only be handled by molecular biologist
 - e) Prions are expensive to acquire
20. Principal hazardous characteristics an agent include all of the following except_____
- a) Cause disease in a susceptible human host
 - b) Pathogenicity of agent
 - c) Capability to infect
 - d) Preventive measures
 - e) ATCC batch number
21. Which one of the following is the earliest agent to be used in biological warfare?
- a) Dengue virus
 - b) *Bacillus anthracis*
 - c) Toxic fungi
 - d) Small pox virus
 - e) *Yersinia pestis*

22. In which of the following laboratories are specimens handled in BSC III ?
- a) BSL-2
 - b) BSL- 3
 - c) KEMRI BSL -1 laboratories
 - d) Biosafety level 4
 - e) BSL - 1
23. Who among the following is credited for the antiseptics?
- a) Florence Nightgale
 - b) Edward Lister
 - c) Arnold G. Wedum
 - d) Alexander Fleming
 - e) Louis Pasteur
24. Which one of the following action is immediately taken if a student spills broth culture of *Salmonella typhi* on the work bench taken?
- a) Switch on the UV- light
 - b) Vaccinate all persons with *S. typhi* vaccine
 - c) Evacuate all the other students from the laboratory
 - d) Place tissue paper soaked with a disinfectant on the contaminated area
 - e) Call the health service provider
25. Which one of the following agent is grouped in Risk 1?
- a) Marburg virus
 - b) Ebola virus
 - c) *Brucella species*
 - d) *Bacillus subtilis*
 - e) *Staphylococcus aureus*

26. The following statements are true about Biosafety of handling specimens except _____
- a) Infected tissue cultures are biohazards
 - b) Aerosols releasing tissue are handled in Biosafety level 3
 - c) PPE is required in BSL-1
 - d) formalin-fixed tissues are treated as non infectious
 - e) Incineration of biological waste is effective
27. Valuable biological Material may include the following except _____
- a) pathogens
 - b) buffer solutions
 - c) toxins
 - d) non-pathogenic organisms
 - e) genetically modified
28. The Material Safety Data Sheet is used for _____
- a) Recording selected agents in the laboratory
 - b) Disposal of infected experimental animals
 - c) Locating recombinant bacteria
 - d) Safe use of blood from laboratory animals
 - e) Filling laboratory incidents
29. Which of the following does not affect sterilization?
- a) Physico-chemical environment (e.g. pH)
 - b) Presence of organic material
 - c) Temperature
 - d) Make of the autoclave
 - e) Type of microorganism

30. Which one of the following protocol is observed in intercontinental transportation of infectious material?

- a) Ministry of Health documents
- b) NIH
- c) CDC
- d) National transport and safety association
- e) IATA

Section B

Question 31

- a) Contrast the duties of a Biosafety and Biosecurity office (8 Marks)
- b) Outline the components of a biological risk management protocol (8 Marks)
- c) Describe the properties of microorganisms that are used in terrorism (4 Marks)

Question 32

Discuss in details the classification of biological risk groups (20 Marks)

