

**BT: 605**

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**Subjective:**

**1. define biosafety?**

**Answer:**

- prevention of large-scale loss of biological integrity,
- prevention mechanisms,
- conduction of regular reviews

**2. facilities of bsl 3 lab?**

**Answer:**

Applicable to diagnostic / clinical/ research/ production/teaching facilities

- potentially lethal disease through the inhalation route
- all procedures must be performed in a biosafety cabinet

**3. Define biosafety level ?2 mark**

**Answer:**

**Definition:** level of containment precautions

- isolate dangerous biological agents
- enclosed laboratory facility
- containment level (BSL-1 to BSL-4)

**4. Describe elements of surveillance? 2 mark**

**Answer:**

- heat detector
- smoke detector
- lighting
- alarms
- cameras

**5. which additional facilities in BSL4 as compared to BSL3. (2)**

**6. Define biosecurity (3)**

**Answer:** A set of preventive measures designed to reduce the risk of transmission of infectious agents.

**It can be**

- increases the level of assurance
- honesty, trustworthy, loyalty with government resources
- reduces the risk of loss and damage

**7. Functions of technical advisory committee (5)**

**8. Name protective equipment in first Aid. (5)**

**Answer:**

**Protective equipment in first Aid:**

- mouth piece for mouth-to-mouth resuscitation

- gloves-protections
- clean up kit for blood spills

**9. How risk can be reduced through risk management describe the logical process (5)**

**10. What are bioweapons.what are their biological threats and also explain the efforts of mitigate them (10)**

**Answer:**

**Bioweapons:** It is defined as any infectious agent used intentionally to cause harm to others.Planning of an effective biowar defence-difficult task

**Types:**

1. Chemical weapons,
2. Radiological weapons,
3. Nuclear weapons

**Defence against bioweapons:**

- international cooperation
- transfer of technology
- support national actions

**Biological threats:**

- terrorist, non-state actors
- misuse of technologies
- theft from lab
- religious extremists
- locally hired agents
- frustrated cult

**Efforts to mitigate:**

- BTWC Act
- designation of focal point
- central implementation authori
- biosafety/biosecurity
- code of conduct /awareness

**11. Duties of biosafety committe 3**

**Answer**

- biosafety policies and code of practice
- review research protocols
- risk assessment formulation
- advice - sensitive discussion

**12. What are potential threats of bioweapons 3**

**Answer:**

Potential threats:

- naturally present in the environment
- no major infrastructure
- no man power
- easier and faster
- cover large area
- difficult to diagnose and treat
- high mortality and mobility
- create panic

### **13. Risks of ionizing radiation 5**

#### **Ionizing radiation**

##### **Risk:**

- somatic effects: radiation induced cancers
- hereditary effects of radiation exposure to the gonads

##### **Protection:**

- minimize the time of exposure to radiation
- maximize the distance from the radiation source
- shielding the radiation source
- substituting with non-radiometric methods

##### **Rules:**

- radiation area
- work-bench area
- radioactive waste area
- emergency response

### **14. Measures require for TB lab?3 marks**

#### **Answer:**

- codes of practice,
- equipment
- lab design and facilities,
- health surveillance,
- training,
- waste handling

**Concepts:** waste handling, incineration, autoclaving, disinfection equipment, work areas, equipment

### **15. Activities of biosafety officers.**

#### **Answer:**

**Biosafety officer:**

- appointment
- ensure biosafety programs and policies
- small scale-technical staff
- microbiology, biochemistry, basic biological sciences

**Duties**

- apply National or International rules,
- regulations/guidelines
- assist lab in developing standard safety procedures
- knowledge of lab, clinical practices

**16. Facilities and apparatus use in BSL1 labs? 2**

**Answer:**

**Laboratory facilities:** doors for access control

- sink for hand washing
- bench tops-resistant
- chairs-easy to disinfect
- lab windows fitted with screens

**Apparatus:** Gloves, lab coats, protective eyewear

**17. Surveillance and notification systems and Physical Security elements?3marks**

**Answer:**

**Physical security elements**

- obstacles placed in the way of attackers
- surveillance and notification system
- methods to recover quickly from disaster

**Surveillance/notification system:**

- heat detector
- smoke detector
- lighting
- alarms
- cameras

**18. What are the activates of human which change fresh water into sewage water? 2**

**Answer:**

The activates of human which change fresh water into sewage water are domestic, agriculture, commercial, industrial,storm water, run off water

**19. How the radiation effect minimized? 2**

**Answer:**

Radiation effect can be minimize the time of exposure to radiation.

**20. What are malicious risk groups, what are there abbreviations, explain it? (10)**

**Malicious risk groups:**

- non-pathogenic -inherent hazardous
- no/insignificant consequence

**Abbreviations****1- low malicious use risk (LMUR):**

- LMUR - low consequences
- most biological agents

**Example:**

- *Mycobacterium leprae*
- gram positive rods/ non-spore former
- organism grow slowly-generation time 30days
- not highly virulent (LMUR)

**2- moderate malicious use risk (MMUR):**

- MMUR-can't deploy as biological weapons
- low / moderate consequences
- low / moderate economic impact
- many current agents evaluated as MMUR
- cure without treatment/life-threatening cases

**Example:**

- *C.immitus* – fungus
- desert fever
- asymptomatic
- biosafety level 3-MMUR

**3- high malicious use risk (HMUR)/extreme malicious use risk (EMUR)**

- national/international consequences
- high casualties
- high economic impact
- *Bacillus anthracis*
- EMUR-HMUR
- not found in the nature
- high security measures
- eradicated
- genetically engineered agents

**Examples:**

- *Variola major virus*
- small pox
- highly virulent /contagious/stable in droplets
- eradicated by vaccine
- GM virus – more virulent

## 21. Application of biosafety rules?

Answer:

### Application of National biosafety rules

- manufacture, import and storage of microorganisms
- gene technological products for research
- field trial of GMOs
- import, export, sale and purchase of GMOs

## 22. Japan biosecurity legislations?

Answer:

### Japan biosecurity legislations

- Japan ministry of health, labor and welfare
- two pillars of biosecurity
- surveillance of infection and infectious agents
- regulations of pathogen handling

### Duties:

- screening of foods, human, vectors at the point of entry
- Japan ministry of agriculture, forest and fisheries
- health issues-animals and plants
- bioweapon-prohibition laws

## 23. Objective of lab biosecurity?

Answer:

### Objectives of lab biosecurity:

- this supports lab safety agenda to prevent diseases
- ensure containment of infectious materials
- maintain citizen confidence of bioscience research community
- transparency to investors in the industries
- protect valuable research and commercial assets
- reduce the risk of crime and bioterrorism

## Mcqs

- 1- AFIA abbreviation? • **America Feed Industry Association**
- 2- Which is used as bioweapon **anthrax**
- 3- Cybernetic means "**governance**"
- 4- **License from federal agency** is required to import/export /sale/purchase genetically modified food
- 5- Risk assessment scheme assess potential hazard **Scoring system**
- 6- Permission for food stuff is necessary for **ingredients of food stuff, additives, processing aid**
- 7- Function of biosafety collaborating counter is **Applied biosafety programs and training**

8- Fire extinguisher have **4 classes**

9- Favr savr tomato 1994 **genetically modified tomato**

10- Which is harmful for human lead, mercury, gold and **arsenic (not sure)**

11- To hack attacker are viruses worms and Torin horses and **all**

12- a suit laboratory personnel must wear positive pressure air protective suit **BSI4**

13- which is not fire

A. Heat

**Oxygen**

C. Fuel

D. Oil

14- Indian GMO's are also called **Alien species**

15- Obstacles are except

1. multiple locks

2. fireproof safes

3. water sprinkles

**4. Lighting**

16- treatment via gene therapy

1. Leukemia

2. Hemophilia

3. Down syndrome

**4. cystic fibrosis**

17- Internal transport is except

1. shipping

2. movement from / to restricted area within facility

3. involve persnol from lab

**4. Carriers**