**Assignments**

**Que 1. Enlist physical methods for control of microorganisms.**

a) Temperature (Heat) →Dry heat →Hot air oven

→Incineration

→Infrared radiations

→ Flaming

→Dessication

→Moist heat →steam under pressure (An autoclave)

→Tyndallisation (Fractional or intermittent sterilization)

→Boiling in water

→Pasteurization

b) Osmotic pressure

c) Radiations → Nonionizing (eg. Uv rays)

→ionizing (eg. Gamma rays)

→ Sonic ultrasonic waves

d) Filtration → Depth filters →Asbestos filters (Seitz filter)

→ sintered glass filters

→Membrane or molecular filters (Millipore filters) (eg. HEPA filter)

**Que 2. Enlist chemical agents which can be used for control of microorganisms.**

1. Halogens & halogen compounds
2. Compounds of heavy metals
3. Phenol & its derivatives
4. Alcohols
5. Detergents
6. Gaseous agents
7. Dyes

**Que 3. Mode of action of ionizing radiations**

Mode of action - When pass through the microbial cells, they produce free hydrogen radicals, hydroxy radicals & some peroxides because of which

→polymerization

→intracellular damage

→disruption of biochemical organization occurs

Example- Gamma rays-emitted from excited nucleus of elements as →CO60

→CS 137

Actually, such elements are by-product of atomic fission or atomic waste products

→Have short wavelength (below 0.01 nm)

→High energy radiations

→Cheapest form of radiations

→Excellent penetration power, so effectively used for materials of considerable volume & thickness

**Que 4. Applications of UV ray for sterilization.**

Applications of UV- Sterilization of air, water, surfaces in food & dairy industries.

Sterilization of hospital operating rooms, operation theatres, (vials or ampoules), filling rooms in pharmaceutical & food Industries.

**Question 5. One-line answer questions:**

1. **Define: Radiation**

Transmission of energy through' the space/material/medium

1. **What are photons?**

Electromagnetic radiations exist as continuous spectrum. It acts like a stream of energy packets called photons.

1. **Define ionizing radiations.**

The radiations which pull electrons away from molecule and ionize them.

1. **How electromagnetic radiations exists?**

Electromagnetic radiations exist as continuous spectrum

1. **Name the of radiations which can be used for sterilization of antibiotics & hormones**

Ionizing radiations

**Question 6. State whether true or false**

1) Lower is the wavelength, higher is the energy associated with radiations - **True**

2) UV rays are having excellent penetration power, so effectively used for materials of considerable thickness - **False**

3) Gamma rays may affect product quality-**True**

4) UV rays kill microorganisms without producing heat - **False**

5) Packaged foods can be sterilized by application of ionizing radiation: **True**