

1)

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VIVA :- Radiation

Protection.

Programme :- BSc - Radiology

4<sup>th</sup> Semester.

Q:- 1

Answer:-

A Radiation protection officer is a specialist in Radiation safety.

The Role of the RPO is to support university work with ionizing radiations by ensuring arrangements are in place to manage radiation risk.

:- forming Roles:-

- 1) preparing periodic status reports on radiation safety and management for purposes of university governance.

P-T-O

(2)

2) Acting is the point of contact within the university for the external radiation protection adviser (RPA).

~~2) Acting is the point of contact~~

(3) Managing Environment Agency permits including:

- Make application for new or variation to existing for new or variation to existing EA permits.

- Manage the collection of waste records and make pollution inventory returns to EA on behalf of the university.

- Advise on routes of radioactive waste disposal.

4) Monitoring site activity against Environment Agency

A-120

(3)

permit conditions, including.

- Expert inspection & auditing of storage & disposal facilities.
- Auditing holding and usage records.
- Auditing waste accumulation in stores.

5) Arranging the security of radioactive sources according to current national requirement and carry out periodic security audits.

6) Managing Facility or site decommissioning.

7) Applying and managing maintenance of a Best Practicable Means (BPM) culture in management and operation.

8) Advising on training in Radiation Safety.

(4)

9) Managing an inventory of equipment emitting x-rays capable of emitting x-rays.

Q → ?  
Answer →

RSO is responsible for:

- stop operations identified as unsafe.
- verify implementation of corrective action.
- Help identify and investigate radiation safety problems.
- Initiate, recommend, or provide corrective action for identified safety.
- Be available for contact by facility staff per regulations and license conditions.
- provide a link between the RSC & uses of

5)

## Ionizing Radiation:

- serve as a member of the RSC (if applicable) & attend the meetings.
- Implement and oversee the operational aspects of the RPP.
- Review and approve (with licensee management) RPP changes before implementation.

Q-3

Ans-→

e: Radiation Hazards→

Radiation Injuries→

It causes changes in the living tissue causing radiation sickness.

Somatic effects→

It is harmful to the person.

Genetic effects→

It is reflected in the offspring.

(b)

2. Radiation decomposition  
i.e. splitting of  $H_2O$  into  
 $H^+$  and  $OH^-$  & also  
splitting of other solvents  
of the body.

2. Incident Radiation when  
travelling through the body  
tissues knock out the  
bound  $e^-$  free from  
their parent atoms  
or molecules.

These free  $e^-$  are highly  
unstable & ~~may~~ interact  
with other atoms and  
molecules within the  
irradiated system.

3. Kinetic energy of  
the incident photons  
heats up the molecules  
of the living tissues.

4. Ionization is another  
process where the  
radiations interact with  
matter to form ions.

5. High energy electromagnetic  
radiation and particles

(7)

radiation are capable of producing ions in their passage through matter.

### Indirect effects →

→ Since 80% of the biological tissue water.

→ Most of the incident radiation energy is absorbed by the water molecules and these are broken down into very unstable and reactive components.

→ Due to generation of H<sub>2</sub>O<sub>2</sub> radicals, subsequent to many series of reaction hydrogen peroxide is formed which is highly reactive oxidizing compound.

→ The biological effects are enhanced by the presence of O<sub>2</sub> which is always present in cells.

Q-4  
Anss-)

protection yourself  
from Radiation :-

Radiation is a part of  
our life.

Background radiation, coming  
primarily from natural  
minerals, is around us  
all times.

protect yourself from  
Radiation with the  
help of  
Time Distance  
& Shielding...

Time-

For people who are  
exposed to radiation ~~too~~  
in addition to natural  
background radiation, limiting  
or minimizing the  
exposure time reduces  
the dose from the  
radiation sources.



### Distances:-

Just as the heat from a fire reduces as you move further away, the dose of radiation decreases dramatically as you increase your distance from the source.

### Shieldings:-

Barriers of Lead, concrete, or water provide protection from penetrating gamma rays & x-rays.

This is why certain radioactive materials are stored under water or in concrete or lead-lined rooms, and why dentist place a lead blanket on pt receiving x-rays of their teeth.

Therefore, inserting the proper shield b/w you and a radiation source will greatly reduce or eliminate the dose to you receive.

## Radiation Emergencies

In large scale radiological release, such as nuclear power plant accident or terrorist incident, the following advised has been tested.

- Get inside.
- stay inside,
- stay Tuned.

## Get inside

In a radiation emergency you may be asked to get inside a building & take shelter for period of time.

- This action is called "sheltering in place".
- Get to the middle of the building or a basement, away from doors & windows.

Stay Inside →

Staying inside will reduce your exposure to radiation.

- close windows & doors.
- Take a shower or wipe exposed parts of your body with a damp cloth.

Stay Tuned →

Emergency officials are trained to respond to disaster situations & will provide specific actions to help keep people safe.

- Get the latest information from radio, television, internet, mobile devices etc.