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papey = Radiation protection

Dept.: BS Radio

Semester = 4th

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Q.NO 9:

Ans: Deterministic effect:

These are caused and effect relationship blw ionizing radiation and certain side effect.

Examples: Hematologic depression,

2) Skin erythema
3) gastrointestinal system death.
4) ~~sys~~ central nervous system death.
5) Epilation
6) Chromosome aberration
7) gonadal dysfunction

This effects are severity and radiation dose dependant. and they have dose threshold.

→ minor effects may be nausea, vomiting and diarrhea.

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2) Stochastic effects of radiation:-

This effects are the result of low doses delivered over along period. They are propability of an effect of increases with close. They have no close threshold.

Examples:-

(1) Radiation induced malignancy and carcino-genie effects.

(2) genetics mutations.

(3) Life span shortening. and local tissues effects.

(4) skin ~~radia~~ related non-malignant changes called radiodevmatits.

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(5) Chromosomal abnormalatis in Lymphocytes.

(6) cataracts in eyes.

(7) survivals of hirosthima and nagasaki are important meterials of this study.

"Q2"

(1) Radiation:

Ans:2: The emission of energy as electromagnetic weves or as moving sub-atomic high energy particles. which cause ionization.

2) radioactivity:

The emission of ionizing radiation or particles.

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are caused by spontaneous disintegration of atomic ~~nuclei~~ nuclei.
The atoms involved are called radionuclides.

(3) Non-ionizing radiation:-

It refers to any type of electromagnetic radiation that does not carry enough energy per quantum to ionize atoms or molecules.
That is to completely remove an electron from an atom or molecule.
They are little harmful.
They can cause surface damage.

Examples:-

1) visible light
2) infrared microwave
3) radio waves

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4) IONIZING Radiation:

It is a type of energy released by atoms in the form of electromagnetic waves or particles. People are exposed to natural sources of Ionizing radiation such as insoil, water and as well as human made sources such as x-rays.
They cause two types of harm to human. direct tissue damage and cancer.

Examples: x-ray / gamma rays, alpha particles, beta particles, neutron particles.

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=> 5) Harmful radiation:-

Radiation damages the cells of the human body. medium levels of radiation can lead to sickness, ~~headach~~ headaches, vomating and fever.

=> Examples:- include

x-rays, gamma rays, alpha and beta particles, radon gas.

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Q NO 3:

Ans: 3 part (A)
Two basic principles:
(A)
i) Time: keep the time of exposure to radiation as short as possible.

2) Distance:
maintain as large a distance as possible Blw the source of radiation and the expose person

part B:
Name OF radiation protection devices:

1) Radiation protection aprons
2) Radiation protection Apron Accessories
3) Radiation protection gloves
4) Radiation protection Glasses

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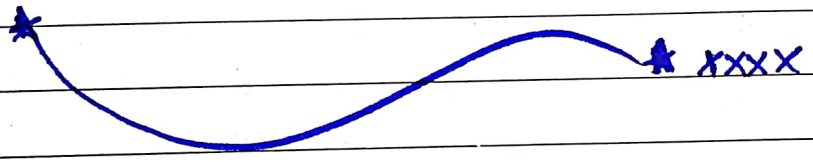
5) Radiation protection thyroid shields
6) Radiation protection Apron Racks
7) Radiation protetion Barriers and table shields.
8) Radiation protection Drape shields.
9) patient radiation protection
10) veterinary Radiation protection.



Q No 4:-

Ans:-

1) Protective x-ray Tube Housing:-

Every x-ray tube must be contained within a protective housing that reduces leakage radiation during use.

2) Control panel:- The control panel must indicate the condition of exposure

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and must positively indicate when the x-ray tube is energized.

3) Source-to-Image Receptor Distance indicator:

A source-to-image distance (SID) indicator must be provided. This can be as simple as a tape measure attached to the tube housing, or as advanced as lasers.

4) Collimation: Light-localized, variable-aperture rectangular collimators should be provided. Cones and diaphragms may replace the collimator for special examination.

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5) Beam Alignment:

In addition to proper collimation, each radiographic tube should be provided with a mechanism to ensure proper ~~alignment~~ alignment of x-ray beam and the Image receptor. It does no good to align the light field and the x-ray beam if the image receptor is not also aligned.

6) Filtration:

All general purpose diagnostic x-ray beams must have a total filtration (**inherent plus added**) of 2.5 mm Al when operated above 70 Kvp. Radiographic tubes operated blw **50** and **70** Kvp must have at least 1.5 mm Al.

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7) Reproducibility:-

For any given radiographic technique, the output radiation intensity should be constant from one exposure to another

8) Linearity:-

When adjacent ~~mA~~ mA stations are used, for example, 100 mA and 200 mA, and exposure time is adjusted for constant mAs, the out put radiation intensity should be remain constant. When the exposure time remains constants, causing the mAs to increase in proportion to ~~to~~ the increase in mA, radiation intensity should be propotional to mAs.

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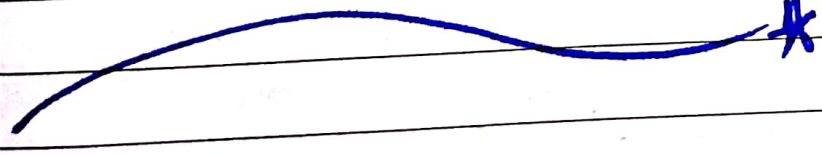
9) operator Shield:-

It must not be possible to expose an Image receptor while the radiologic technologist stands unprotected outside a fixed protective barriers, usually the console booth.

10) Mobile X-ray Imaging system:-

A protective lead apron should be assigned to each mobile X-ray imaging system.



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Q NO 5:

Ans: A ~~geiger~~ geiger counter (geiger molar tube) is a device used for detection and measurment of all types of radiation. alph, beta and gamma radiation. besically it consist of a pair of electrode sorounded by a gas. The electrodes have a high voltage across them. The gas used is usally hylium or argon.

Principles: The ionizing particles passing through the tube. Ionizes the gas and electron. so produced move toward anode.

Used For: Gina counter is a device used for qualitative and quantitative analysis of radiation.

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it is efficient in detective 100% alpha and beta rays and two % x-rays. It can also be adopted to detect neutron.

Operating voltage:

50 - 75 volts

Machanism of GM tube:

The Ionizing effect of radiation is used in the GM tube as a means of detecting of radiation. The GM tube is a hollow cylinder filled with a gas at low pressure.

DEFECIENCIES OF GM Counter:

1) Energies can not be measured by it as it has a lack of differenciating abelities.

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2) it is less effecient due to the large paralyses time limits and large dead time

GM As A radioactive protective device:

it is a protective in nature because due to its detective and measuring capacity of radiations, we can protect our self and our other living organisms from harmful large doses of radiation.

2) By calculative feature we can make use of radiation for bio-medical purposes in a safe range.