Final term examination (INU)

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Ans

Deterministic effect.	stochastic effect.
Determenestric effect Describe a cause and effect relationship between ionizing radiation and certain side-effect. They are also known non-stochastic effects to contrast them with chance like stochastic effects. e.g. cancer induction The effect depend on dose. dose rate dose fractionation irradiated volume and typ of Radiation LET	Effect that occur by chance and which may occur without a threshold level of dose whose probability is proportional to the dose and whose severity is independent of the dose In the context of radiation protection the mean stochastic effect is cancer. Effect of radiation exposure under certin dose are not clear

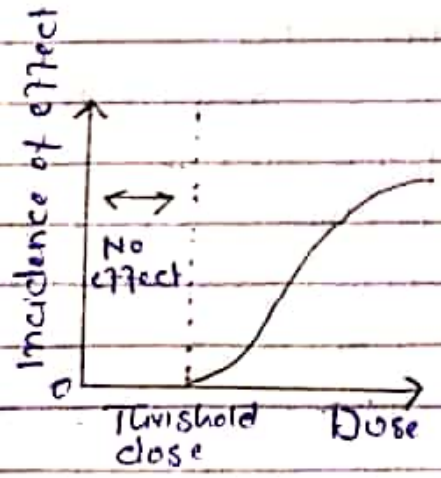
D- effect have a threshold below which the effect does not occur.
The threshold may be very low and may very from person to person.
The practical threshold does below which no significant change are apparent and these threshold never be reached occupationally if sensible procedure of upheld.

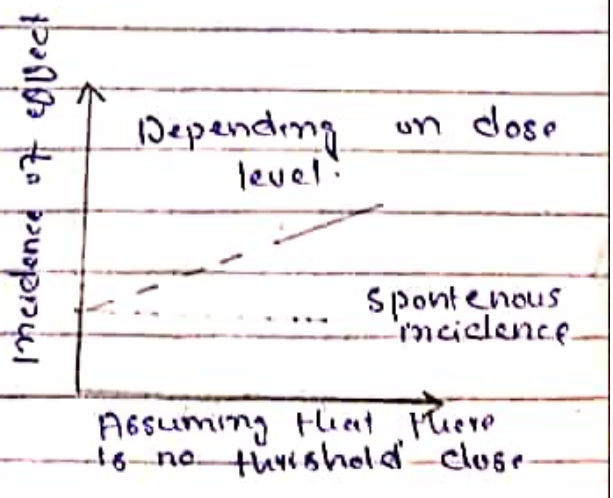
because effect of other cancer promoting factor such as smoking and drinking habits are two large.
However the ICRP specifies the standard for radiological protection for such low dose exposure assuming that may have some effect as well.

Deterministic effect : Stochastic effect

a) Hair loss
b) Cataract
c) Skin injury
etc

a) cancer
b) leukemia
c) Hereditary effect
etc.





Q2

Ans **Radiation:-**

Radiation is energy emitted from unstable atoms in the form of electromagnetic waves or photons or in the form of subatomic particle to become more stable.

eg. Alpha, Beta, Gamma.

Radioactivity:-

The radioactivity is the property of some atoms to spontaneously give off energy as particles or rays. The atom that make up the radioactive material are the source of radiation

Non-Ionizing radiation:-

This kind of radiation cannot produce ions. These rays aren't directly harmful, in fact our lives depend heavily on these for survival.

Examples include infrared waves Radio waves ultraviolet waves etc.

Ionizing Radiation:-

This kind of radiation interaction with matter can

produce charged particle called ions.
Some of these rays in excess can be harmful. These are even use for medical purpose.
Example: x-rays cosmic rays Gamma rays.

Harmful radiation:
Radiation damage the cells that make up the human body. Low level of radiation are not dangerous but medium level can lead to sickness headaches vomiting and a fever. High levels can kill you by causing damage to your internal organs. Its difficult to treat high radiation exposure.

Q3 Two Basic principles of Radiation protection

Ans Justification:
Any decision that alters the radiation exposure situation should do more good than harm.

Dose Limitation:
The total dose to any individual should not exceed the appropriate limits.

13 Name of Radiation protection device.

-> Radition protechum eyroms.
-> Radiation protechum eyron accessories.
-> Radiation protection Gloves.
-> Radiation protection Glasses.
-> Radiation protection thyriod shield
-> Radiation protechum Apron Racks.
-> Barriers and table shield.
-> Drape shield.
-> patient protechum
-> veterinary radiation protechum.

Q4 Radiographic protechum features.

Ans Many radiation protechum devices and accessories are associated with with modern imaging system.

protective x-ray tube Housing.

Every x-ray tube must be contained within a protective housing that reduce leakage radiation during use. Leakage radiation must be less than 1mGy. (100MR/hr) at a distance of 1m from protecting housing.

Control panel

The control panel mus

Indicate the condition of exposure and must positively indicate when the x-ray tube is energized.
The requirements are usually satisfied with the use of kvp and MA indicator.

Source to image Receptor distance indicator.

A source to image receptor 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.

Collimation :-

Light localized variable aperture rectangular collimator should be provided. Cones and diaphragm may replace collimator for special examinations.
- The x-ray beam and the light beam must coincide to within 2% of the SID

positive beam Limitation :-

Automatic light localized variable aperture collimator were required on all but special

x-ray imaging system manufactur in the United state b/w 1974 and 1994.
The IB PBL must be accurate to within 2% of the SID.

Beam Alignment :-

In addition to proper collimation each radiographic tube should be provided with a mechanism to ensure proper alignment of the x-ray beam and the image receptor.

Filtration:

All general purpose diagnostic x-ray beam must have a total filtration (inherent plus added) of at least 2.6 mm all when operated above 70 kvp Radiographic tube operated b/w 50 and 70 kvp. must have at least 1.6 mm Al. x-ray tube designed for mammography have 30 HVL Mo or 60 HVL Rh filtration.

Design of protective Barriers

In designing a radiology department or an individual x-ray examination Room it is not sufficient to consider only general :

architectural great attention must be given to the location of x-ray imaging system in examination room.
A great no of factor considered when a protective barrier is design.
primary radiation is the usefull beam.

Q.5

Ans **GM-counter:**

A Geiger counter is ab come from GM counter. Geiger Muller tube work on a gas pair electrod helium or organ gas are used this device is use to detect radiation. It also measure the power and range of radiation. So therefore it used for protection of radiation area.

Uses:

Geiger muller counters operate under even higher voltage b/w the anode and the cathode usually in the 800 to 1200 volt range like the propushnal counters. the high voltage accelerate the charge produced

in the initial ionization to very few have enough energy to ionize electron in the gas However this cascading of ions occur to a much larger degree continous until the counter is saturated with ions.

The electronic circuit of a GM- counter and record the number of pulses and the information is often displayed in counts per minute. This only take a fraction of a second but this process slightly limit the rate at which individual event can be detected.

The GM- counter were named for Hans Geiger who invented the device in 1908. and walther muller who collaborated with Geiger in developing it further in 1928.