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Subject = radiation protection
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★ QNO1 :

★ Ans :

★ STOCHASTIC EFFECT

- 1) Have no threshold level of radiation dose.
 - 2) The probability of the effect is proportional to the dose.
 - 3) A latent period is seen b/w the time of exposure and the event to manifest.
 - 4) Severity - independent of dose received.
 - 5) Seen when the cells are modified rather than killed.
- a) This is produced by low doses delivered by long period.

★ DETERMINISTIC EFFECT

- 1) Have definite threshold level of radiation dose.
 - 2) The probability of effect is proportional to the dose.
 - 3) A latent period is seen b/w the time of exposure and event to the manifest.
 - 4) Severity may be proportional to the dose received.
 - 5) Seen when the cells are killed or lose capability to divide.
- b) This is produced by high radiation dose.

★ Q No 2: →

Ans:

Radiation → The radiation is the energy emitted from unstable atoms in the forms of electromagnetic wave or photons.

→ By diffination
things like heat include mundane radar

and microwave which pose no significant risk to human health.

* Radioactivity →

Is the spontaneous emission of radiation in the form of particles or high energy photons resulting from a nuclear reaction.

The particles which are emitted from nuclei as a result from / of nuclear instability.

* Non-ionizing radiation :-

A type of low energy radiation that does not have enough energy to remove an electron from an atom or molecule.

Non ionizing radiation includes visible light, infrared, UV light, microwave, radio wave.

* IONIZING RADIATION :-

It radiates with enough energy so that during its interaction with an atom it can remove tightly bound electrons from orbit of an atom to become charged.

★ Harmful Radiation →

Exposure to very high level of radiation such as being exposed to an atomic blast can cause acute health effect such as skin burn and acute radiation syndrome.

★ IND 3:

Principle (A)

→ Basic principle:

① Justification →

No use of ionizing radiation is justified if there is no benefit.

- All application must be justified
- All even smallest exposure are potentially harmful and the risk of must be offset by a benefits.

★ Optimization :-

As low as reasonably achievable this means radiation exposure should be limited as much as possible keeping in mind the

risk-benefit radiation and its application. For example, it is unreasonable to refuse an x-ray after a bone fracture b/c statistically this may shorten your life expectancy by one day.

* (B) Radiation protection devices :-

- (1) Radiation protection aprons.
- (2) Apron accessories
- (3) Radiation protection gloves.
- (4) Glasses
- (5) thyroid shields
- (6) Apron racks.
- (7) Drop shield,
- (8) Barrier and table shields.

* Q No 4:

* Ans: Feature for radiation protection designs :-

→ Many radiation protection devices and accessories or associated with modern x-rays imaging system.

★ ⇒ protective X-ray tube housing is

every X-rays tube must be
content within a protective
housing that reduce leakage
radiation during use.

★ ⇒ Control panel:—

The control panel must indicate
the condition of exposure and
must positively indicate with its
~~extra~~ X-ray tube is organized.
These requirement are usually
~~satisfy~~ satisfied with the use
Kvp and mA indicator.

★ ⇒ Source - to - image receptor
Distance indicator: →

A source to image receptor
distance indicator must be
provide. This can be a simple
as a tape measured attached
to the tube housing, or a
advanced as lasers.

★ → Collimation: → The X-rays beam
and light beam must coincide
to within 2% of the SID.

* ⇒ Positive beam limitation: →

PBL must be adjusted so that with any image receptor size and used - and if all standard SID, the collimator shutter automatically provide an X-rays beam equal to the image receptor.

→ The PBL must be accurate to within 2% of SID.

* Beam Alignment: →

Each radiographic should be provide proper alignment of X-ray and image receptor.

* ⇒ Filtration: →

X-rays tube designed for mammography have 3.0mm Mo or 4mm Rh filtration.

* → Reproducibility: →

The variation and X-ray intensity should not exceed 5%.

★ → Linearity: →
The maximum acceptable variation in linearity is 10% from one MA station to an adjacent MA station.

→ This takes any an accuracy in the exposure time out of the analysis.

★ ⇒ Operator Shield: ⇒

It must not be possible to expose an image receptor while the radiological technologist stands unprotected outside of fixed protective barriers usually a console booth.

★ ⇒ Mobile X-rays Imaging System: ⇒

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

* Q No 5 →

* Ans: GM (Geiger Counter)
↳ As a device used for detection and measurement of all type of radiation α , β and γ radiation. Basically it consist of a pair of electrodes surrounded by a gas. The electrodes have high voltage across them the gas used as usually helium or argon. When radiation enter in tube it ionizes the gas, the ion are attracted to the electrodes and electric current is produced a scaler count the colour pulses and one obtained a count whenever radiation ionizes the gas.

