Mohamud Harbi Primary and secondary school		**Grade: Form four**
Subject: Physics		**Date: 1/3/2019**
Chapter (8): Modern physics		**Teacher: Mohamed Hassan Abdullahi (Daacad)**

1) What are the properties of electromagnetic waves ?

- The properties of electromagnetic waves include:
  - ✓ They travel at the speed of light, i.e., 3 x 10^8m/s in vacuum.
  - ✓ They are transverse waves.
  - ✓ They travel in straight lines.
  - ✓ They transfer energy (E = hf).

2) Define cathode rays ?

- Cathode rays are streams of electrons moving at high speed from a heated cathode.

3) What are properties of cathode rays ?

- The properties of cathode rays are as follows:
  - ✓ They travel in straight lines from the cathode.
  - ✓ They cause certain substances to fmoresce.
  - ✓ They possess kinetic energy.
  - ✓ They are deflected by magnetic and electric fields.
  - ✓ They produce X-rays on striking a metal target.

4) Name the three parts of cathode ray oscilloscope consists ?

- The cathode ray oscilloscope consists of three parts, namely;
  - ✓ The electron gun.
  - ✓ The deflecting plates.
  - ✓ A fluorescent screen.

5) What are uses of cathode rays ?

- The cathode ray oscilloscope is used for:
  - ✓ Measuring a.c. and d.c. voltages.
  - ✓ Measuring frequencies.

- ✓ Measuring phase differences.
- ✓ Measuring small time intervals.
- ✓ Study wave pattern (forms).

6) Define x-rays ?

- ❖ X-rays are electromagnetic radiations of short wavelengths of the order 10^{-10m}.

7) What is the difference between soft x-rays and hard x-rays ?

- ❖ The difference between soft x-rays and hard x-rays:
  - ✓ Soft X-rays have low penetrating power, and are produced by relatively low voltage.
  - ✓ Hard X-rays have high penetrating power, produced by high voltage.

8) What are properties of x-rays ?

- ❖ The properties of x-rays are:
  - ✓ They travel in straight lines, at the speed of light.
  - ✓ They cannot be deflected by electric or magnetic fields.
  - ✓ They can be reflected through very large angles of incidence.
  - ✓ Refractive indices of all materials are very close to unity for X-rays.
  - ✓ There is mining boundary. They can be diffracted.

9) What are the defective of x-rays ?

- ❖ X-rays are detected by the following properties:
  - ✓ They cause fluorescence in certain substances.
  - ✓ They affect photographic emulsion.
  - ✓ They ionize gases.
  - ✓ They are not deflected by electric or magnetic fields.

10) What are uses for x-ray ?

- ❖ X-rays are used for:
  - ✓ Locating bone fractures.
  - ✓ Destroying cancer cells.
  - ✓ Locating internal imperfections in welded joints and castings.
  - ✓ Studying of crystal structures.

11) What is the precautions when using x-rays ?

- ❖ Precautions when using x-rays:
  - ✓ Minimize the exposure time as much as possible.
  - ✓ Workers exposed to X-rays should always wear protective clothing.

12) What are dangers of x-rays ?

- ❖ Dangers of X-rays:
  - ✓ Kill living cells when overexposed.
  - ✓ Interfering with gene structure.

13) Define photoelectric effect ?

- ❖ Photoelectric effect is the process whereby electrons are emitted from matter when an electromagnetic radiation falls on it.

14) What are factors affecting photoelectric emission ?

- ❖ Factors affecting photoelectric emission:
  - ✓ The number of photoelectrons emitted per second is proportional to the intensity of the incident radiation.
  - ✓ The emitted electrons have various kinetic energies with velocities ranging from zero up to some maximum value, which increases as the frequency of the radiation increases.

15) Define threshold frequency ?

- ❖ Emission of electrons occurs only if the frequency of the incident radiation is above some minimum value called **threshold frequency.**

16) Define work function ?

- ❖ Work function of a metal is the minimum energy required to liberate an electron from the surface of the metal.

17) Define stopping potential ?

Stopping potential is the minimum potential required to stop the electrons is called

18) What are photocells is used for ?

- ❖ Photocells are used in counting systems, intruder alarms, sound reproduction from film, light-meters, artificial lighting, etc.

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