

TECHNICAL UNIVERSITY OF MOMBASA
FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN MEDICAL LABORATORY**

BMLS 14S &15M/YEAR4/ SEMESTER1

AML 4406: MEDICAL IMAGING

SEMESTER EXAMINATION

SERIES: NOV/DEC. 2016

TIME: 2 HOURS

1. Describe Atom

- a. Have equal number of protons and neutrons
- b. Cause electromagnetic waves
- c. Become negatively charged on gaining or losing electrons
- d. Atoms are the basic units of matter.
- e. All of the above

2.. What is the outcome of adding a neutron to an atom

- a. makes it isotope
- b. Becomes heavier version
- c. the number of neutrons in atom determines isotope.
- d. Atom becomes radioactive
- e. It becomes charged

3. Describe isotopes of carbon 12 and carbon 14

- a. They all have same number of protons and neutrons.
- b. Carbon 12 is stable, carbon 14 is unstable.
- c. They are radioisotope
- d. The number of protons are usually more than neutrons
- e. They are all unstable isotopes

4. Ionization is.

- a. mainly radioactive decays to
- b. form parent and daughter isotope
- c. Losing or gaining electrons
- d. Losing or gaining neutrons.
- e. Being negatively charged.

5. Define radiation.

- a. Radiation in the way heat travels.
- b. The flow of heat from one place to another
- c. means by which electro-magnetic waves travel at the speed of radio waves.
- d. Causes ionization.
- e. Heat

6. Explain the result of radiation hitting tissue

- a. Partly absorbed, Partly scattered, Partly reflected.
- b. Partly, absorbed, partly emitted, and partly reflected.
- c. Partly decayed by half-life, partly absorbed, partly transmitted.
- d. The reflected has no use
- e. Reflected only

7. Beta particles released during disintegration by some isotopes

- a. Originates from the nucleus by breakdown of a neutron into its proton-electron components
- b. Originate from consequence of radioactivity reaction
- c. Originate from positively charged particles.
- d. Originate from gamma rays emitted
- e. originate from alpha particles

8. One of these is a naturally occurring isotope of Hydrogen

- a. Uranium
- b. Tritium
- c. Neutron
- d.odium
- e. protons

9. Radionuclide is

- a. Radioactive materials
- b. isotopes
- c. Radio waves
- d. Heavy materials
- e. Are stable

10. one of the following is introduced into the body to enhance differences in the neighbouring body structure

- a. Radiation
- b. radio pharmaceuticals
- c. Contrast agent
- d. Gamma rays
- e. Alpha rays

11. Identify the properties of Deuterium

- a. 1 proton and 0 neutron
- b. 1 proton and 1 neutron
- c. 1 proton and 2 neutrons occurring naturally, not stable
- d. 1 Proton and an electron

12. The particles bellow make up an atom

- a. Neutron Electron Deuterium
- b. Electron tritium Neutron
- c. protons Neutrons Electron
- d. Neutron gamma proton
- e. protons Alpha Electrons

13. The atomic number of an element is also known as

- a. The number of its proton
- b. The mass
- c. The number of protons and neutrons
- d. The number of Electrons
- e. All of the above.

14. The parent isotope refers to the isotope which

- a. undergoes radioactive decay
- b. Are man made during nuclear reaction
- c. are unstable materials
- d. are not radioactive
- e. none of the above

15.. Describe radioactivity

- a. The emission of ionizing radiation
- b. Particles caused by spontaneous disintegration of atomic nucleus
- c. Consequence of nucleus reaction
- d. Release of energy and particles.
- e. chemical reaction

16. somatic effect of radiation on the body are;

- a. Long term
- b. Short term
- c. Genetic
- d. causes cataract genesis
- e. Death

17. Electrons of an atom are attracted to the protons by a force known as

- a. Nuclei transmutation
- b. Electric charge
- c. nuclear force
- d. Electromagnetic force
- e. **radiation**

18. The number of ----- defines the isotope of the element

- a. Electron
- b. Neutrons
- c. Protons
- d. Chemical bonds
- e. Electric charges

19. Gamma Rays can be halted by ----- to limit a worker's exposure

- a. Metal
- b. the thickness of piece of paper
- c. cloth
- d. Lead shielding
- e. Heavy boots

20. The number of --- influences the magnetic properties of an atom

- a. isotopes
- b. Neutron
- c. Electrons
- d. Protons
- e. hydrogen

21. The ALARA Principle states that radiation absorbed by the body

- a. Should be restricted
- b. should be as low as reasonably achievable.
- c. Should be the smallest possible
- d. Is inconsequential
- e. Should be reduced when necessary

22. Describe half life of an element

- a. The time taken to absorb radiation
- b. The time taken for an element to decay
- c. The time taken for parent atom to form daughter atoms
- d. The time taken for a half of an element to decay
- e. Disintegration of any elements

23. One of the following reactions from chain decay

- a. Nuclear reaction of stable elements
- b. Unstable parent which produce unstable daughters
- c. stable parents which form stable daughters
- d. Unstable parents which form stable daughters
- e. man made nuclear reaction

24 State safety precautions that should be taken when using radioactive materials

- a. Kept in boxes when not in use
- b. hold with away from the eyes
- c. hold with forceps
- d. Shielding with lead
- e. All of the above

25 Medical imaging is required to use radioisotopes which have

- a. Long half life
- b. short half life
- c. moderate half life**
- d. radiopharmaceuticals
- e. all of the above

26. state the criteria for use of radioactive element in medical imaging

- a. when people require treatment and diagnosis
- b. When people feel like doing medical check up
- c. when people are very sick
- d. when the benefits outweigh the risks
- e. when the risks outweigh benefits

27. Atoms are attached to one another to form chemical compounds by

- a. chemical integration
- b. chemical reaction
- c. chemical fusion
- d. chemical bonding
- e. Nuclear split

28. Alpha particles when emitted resembles

- a. helium atom
- b. Carbon atom
- c. Hydrogen atom
- d. Atomic mass
- e. Atomic weight

29. Persons who are exposed to radioisotopes during a procedure

- a. Become weak
- b. Become radioactive
- c. Becomes sick
- d. All of the above
- e. carcinogenic

30 The dose of radiation is measured in

- a. Joules
- b. Siervert
- c. Gray
- d. grams
- e. None of the above

PART B

2 , Describe principles of radiation protection to decrease dosage of radiation to precautiously limit workers exposure. 20mks

3 Describe radio pharmaceuticals and their use to include instruments used in Magnetic Resonance Imaging (20Mks)