قائمة الاسئلة 2025-04-30 04:14

فيزياءوأجهزة الطب النووي-الثالث-اشعة-كلية الطب-برامج علوم تطبيقية-درجة الامتحان(70)

د/ مشتاق العزعزي

1) What does the term radiation refer to in nuclear medicine?
   1) - Energy stored in the nucleus
   2) - Energy from electron movement
   3) + Energy in transit
   4) - Energy created from light waves
2) Which energy that carries energy in the form of kinetic energy of mass in motion?
   1) - Electromagnetic radiation
   2) - Gamma rays
   3) + Particulate radiation
   4) - X rays
3) Which property distinguishes electromagnetic radiation from particulate radiation?
   1) - Electromagnetic radiation consists of moving particles
   2) + Electromagnetic radiation moves at the speed of light
   3) - Particulate radiation carries energy in the form of waves
   4) - Particulate radiation does not interact with matter
4) What type of materials used in nuclear medicine for imaging and therapy ?
   1) + Radioactive materials
   2) - None radioactive elements
   3) - Magnetic particles
   4) - Organic molecules only
5) What is a radiopharmaceutical ?
   1) - A drug used to treat cancer
   2) - A chemical used in chemotherapy
   3) + A compound labeled with a radionuclide
   4) - A magnetic contrast agent
6) What makes nuclear medicine unique compared to MRI or CT?
   1) - It uses sound waves
   2) + It measures biological processes
   3) - It provides anatomical images
   4) - It is cheaper
7) What mode of decay is I131?
   1) + DECAY BY (β−, γ) EMISSION
   2) - POSITRON (β+) AND (β+, γ) DECAY
   3) - DECAY BY β− EMISSION
   4) - Decay By (β+, γ)
8) What is the Auger effect ?
   1) - Emission of gamma rays
   2) + Energy transferred to another electron causing its ejection
   3) - Emission of beta particles
   4) - Absorption of radiation
9) Which of the following particles is commonly used in positron emission tomography (PET)imaging?
   1) - Alpha particles
   2) - Beta particles
   3) + Positron
   4) - Neutrons

10) What type of decay converts a neutron into a proton and electron?
1) - Alpha decay
2) - Beta plus decay
3) - Gamma decay
4) + Beta minus decay

11) Which decay results in positron emission ?
1) - Beta minus decay
2) + Beta plus decay
3) - Alpha decay
4) - Gamma decay

12) How does Technetium -99m , a commonly used radioisotope in nuclear medicine emit radiation?
1) - Alpha particles
2) - Beta particles
3) + Gamma rays
4) - Neutrons

13) What is time it takes for a radionuclide to decay to half its activity called?
1) - Full life
2) + Half life
3) - Quarter life
4) - Decay life

14) Which imaging technique invloves the injection of a radioactive tracer that emit positrons?
1) - Computed tomography (CT)
2) - Single photom emission computed tomography(SPECT)
3) + Positron emission tomography (PET)
4) - linear accelerator (linac)

15) How does gamma camera create images in nuclear medicine?
1) - By capturing visible light
2) + By detecting emitted gamma rays and creating spatial map
3) - By converting light to electrical signal
4) - None of the above

16) What does SPECT stand for in nuclear medicine?
1) - Scintillation photon emission technique
2) - Spectral emission tomography
3) + Single photom emission computed tomography
4) - Positron emission tomography

17) Which of the following radioactive isotopes undergoes spontaneous decay by emmiting posotron?
1) - C 14
2) + Fluorine -18
3) - I 131
4) - TC 99-M

18) What is parent nuclide in TC 99M generator ?
1) - TC 99-M
2) - in -99
3) + M0-99
4) - Cd - 12

19) What type of nuclear reaction occurs in reactor to produce radionuclide like I131 and Xe -133?
1) - Nuclear fusion
2) + Nuclear fission
3) - Beta decay occurs

4) - Alpha decay

20) In gamma camera most collimators in use are ….....
1) + Parallel hole collimators
2) - Pin hole collimators
3) - Diveging
4) - Converging

21) Which element is bombarded in a cyclotron to produce In - 111?
1) - I - 131
2) - TC - 99m
3) + Cd -112
4) - Mo-99

22) In PET imaging, what is the role of coincidence detector?
1) - Measur gamma rays
2) + Records positron annihilation events
3) - Capture x rays
4) - Detect magnetic field

23) What kind of images does PET produce ?
1) - Anatomical image
2) - Structural image
3) + Functional and metabolic images
4) - Only bone image

24) What is the primary characteristics of metastable nuclear states?
1) - High stability
2) - Transit existence
3) + long life befor decay
4) - Non radioactive

25) What role do Cadmium control rods play in a nuclear reactor ?
1) - Speed up the chain reaction
2) + Absorb neutrons to control the reaction
3) - Generate additional radioactive isotopes
4) - Convert thermal neutrons into fast neutrons

26) What does term FDG refer to in PET imaging?
1) - Flourescent Dopamine
2) - Fused dual gamma
3) - Fast diffusion gradient
4) + Fluorodexyglucose

27) What does FDG uptake in PET imaging primarily reflect ?
1) - Protein synthesis
2) + Glucose metabolism
3) - DNA replication
4) - Lipid metabolism

28) What is the role of scintillation crystal in gamma canera?
1) - Block high energy radiation
2) + Convert gamma photons into visible light
3) - Generate gamma radiation
4) - Convert visible light to electrical signal

29) Which is radioactive isotope is commonly used to in gamma camera for imaging the thyroid?
1) - Technetium - 99m
2) + Iodine - 131

3) - Fluorine -18
4) - None of the above

30) In nulear medicine , what does the term tracer refer to ?
1) + A radioactive substance injected into the boody
2) - Achemical used to clean the imaging equipment
3) - A Type of contrast agent for x ray
4) - A device for measyring radiation levels

31) In gamma camers, Which device is used to convert light into electrical signal?
1) - scintillator crsytal
2) - collimator
3) + photomultplier tube
4) - Filter

32) The collimator in a gamma camera is used to :
1) - Cool the dtector
2) - Convert photons to electrons
3) - Increase resolution by magnifying the image
4) + Filter specific photon direction

33) The energy of gamma photons emitted in PET is approximately:
1) - 140Kev
2) + 511KeV
3) - 512keV
4) - 50Kev

34) What happens during annihilation in PET imaging?
1) - A positron collides with an electron
2) + Positron and electron combine, releasing photons
3) - positron emission exceeds electron emission
4) - Beta decay occurs in radioactive isotope

35) In SPECT imaging , how is 3D image reconstruct ?
1) - Using sound waves
2) - Through magnetic gradients
3) + By rotating the gamma camera around the patient
4) - Using mirrors and lenses