قائمة الاسئلة

فيزياء وأجهزة الطب النووي - المستوى الثالث - قسم أشعة - كلية الطب والعلوم الصحية - برامج العلوم الطبية التطبيقية - الفترة الثالثة - درجة الامتحان

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1) What is a radionuclide ?
   1) - A stable atom
   2) + An atom with an unstable nucleus that emits radiation
   3) - An atom that has lost electrons
   4) - A non reactive gas
2) What is the primary use of radiopharmaceuticals in medicine ?
   1) - Pain relief
   2) - Blood pressure regulation
   3) + Diagnostic imaging
   4) - Anti inflammatory treatment
3) Which of the following radionuclides is produced in a nuclear reactor?
   1) - Fluorine -18
   2) - Carbon -11
   3) + Iodine - 131
   4) - Nitrogen -13
4) What is the role of a radionuclide generator in radiopharmaceutical production?
   1) + To separate daughter radionuclides from a parent radionuclide
   2) - To synthesize new radionuclide
   3) - To destroy unsable radionuclide
   4) - To accelerate particles for bomardment
5) What is the process by which unstable atoms become more stable by emitting particles and radiation?
   1) - Radioactivity
   2) - Radionuclide
   3) + Radioactive decay
   4) - None of the above
6) What mode of decay is I 131?
   1) - DECAY BY β− EMISSION
   2) + DECAY BY (β−, γ) EMISSION
   3) - POSITRON (β+) AND (β+, γ) DECAY
   4) - None of the above
7) What mode of decay is C14?
   1) - DECAY BY (β−, γ) EMISSION
   2) - POSITRON (β+) AND (β+, γ) DECAY
   3) + DECAY BY β− EMISSION
   4) - None of the above
8) What is the primary purpose of gamma camera in nuclear medicine ?
   1) - Measure radioactivity levels
   2) + Detecet and image gamma rays
   3) - Produce radioactive isotopes
   4) - Shield against 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) In nuclear medicine what is the role of a collimtor in the gamma camera?
1) - Generate gamma rays
2) - Detecet beta particles
3) - Shield against radiation
4) + Focus the gamma rays onto the detector

11) What unit is used to express the activity of a radioactive substanse?
1) + Becquerel (Bq)
2) - Gray(Gy)
3) - Curie (Ci)
4) - Sievert(Sv)

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 purpose of scintillation crystal in a gamma camera ?
1) - Generate gamma rays
2) + Convert gamma rays into visible light
3) - Shield against radiation
4) - store radioactive isotopes

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) What is primary advantage of SPECT over planar (Anger) camera?
1) - Faster imaging time
2) + Three dimensional imaging capability
3) - Use of lower radiation doses
4) - All of the above

18) What material is commonly used for the scintillating crystal in gamma cameras?
1) - Sodium chloride
2) - Calcium sulfate
3) + Sodium iodide with thallium (NaI(Tl))
4) - Potassium bromide

19) What material is commonly used to make a collimator in gamma camera?
1) - Aluminum
2) - Copper
3) - Titanium

4) + Lead

20) Which of the following is a common application of nuclear medicine ?
1) + Cancer diagnosis and treatment
2) - Blood pressure measurement
3) - x ray imaging
4) - Bone fracture repair

21) Which radioactive tracer is commonly used in PET scans ?
1) - Iodine - 131
2) - Technetium - 99m
3) + Fluorine -18
4) - Cobalt -60

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) Which imaging modality is often combined with PET for anatomical correlation?
1) - Magnetic resonance imaging (MRI)
2) + Computed tomography (CT)
3) - Ultrasound
4) - X ray

25) Which type of radiation is detected by a PET Scaner ?
1) - Alpha particles
2) + Gamma rays
3) - Beta particles
4) - 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) Which material is commonly used in detectors in PET imaging/
1) - Lead
2) + Sodium iodide
3) - Sodium iodide with thallium (NaI(Tl))
4) - Copper

28) What is the role of positron in PET imaging ?
1) - It creates X ray for imaging
2) + It annihilates with an electron to produce gamma rays
3) - It directly produces an image on the detector
4) - It stabilizes the radionuclide

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 measuring 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) What is purpose of a PET - CT scan in nuclear medicine ?
1) - Assessing bone fractures
2) - Detecting neurological disorders
3) - Evaluating lung function
4) + Combining anatomical and functional information

33) What is the half - life of radioactive isotope?
1) - The time it takes for radiation to decay completely
2) + The time it takes for half of a radioactive sample to decay
3) - The time it takes for a tracer to reach its target organ
4) - None of the above

34) Which imaging technique uses a rotating gamma camera to create cross sectional image?
1) - PET
2) + SPECT
3) - CT
4) - MRI

35) What is the typical energy level of gamma photons used in PET imaging?
1) - 140 keV
2) - 2.5 MeV
3) + 511 KeV
4) - 1.17 MeV