

11/2014

1. The power generating unit of a cell is :  
(A) Mitochondria (B) Endoplasmic reticulum  
(C) Golgi complex (D) Centrosome
2. The white blood corpuscle which has multiple lobes is :  
(A) Basophil (B) Lymphocyte (C) Neutrophil (D) Eosinophil
3. Highest area for perception of visual sensation is :  
(A) Frontal lobe (B) Occipital lobe (C) Parietal lobe (D) Temporal lobe
4. Bowman's capsule is located in :  
(A) Kidney (B) Eye (C) Liver (D) Heart
5. Caseating granuloma is feature of :  
(A) Pneumonia (B) Typhoid (C) Leptospirosis (D) Tuberculosis
6. The caloric value of carbohydrate is :  
(A) 2 Kcal/kg (B) 4 Kcal/kg (C) 6 Kcal/kg (D) 9 Kcal/kg
7. Right ventricle pumps blood into :  
(A) Aorta (B) Pulmonary vein  
(C) Superior vena cava (D) Pulmonary artery
8. Outermost coat of blood vessel is :  
(A) Tunica media (B) Tunica albuginia  
(C) Tunica intima (D) Tunica adventitia
9. Sensation mediated by nociceptors is :  
(A) Touch (B) Temperature (C) Pain (D) Vibration
10. Acromegaly is due to excess secretion of :  
(A) ACTH (B) TSH  
(C) Growth hormone (D) Prolactin
11. Curie is the unit of :  
(A) Energy of gamma rays (B) Half life  
(C) Radioactivity (D) Intensity of X-rays

12. Ways of hardening the X-ray beam :
- (A) Using filtration (B) Increasing the voltage  
(C) Both of the above (D) None of the above
13. Thermions are :
- (A) Protons (B) Electrons (C) Photons (D) Positrons
14. Isotopes are atoms having :
- (A) Same number of protons, but different number of neutrons  
(B) Same number of neutrons, but different number of protons  
(C) Same number of protons and neutrons  
(D) None of the above
15. Advantages of cancer screening include the following except :
- (A) Reduction in mortality  
(B) Reduced number of patients requiring radical treatment  
(C) Over diagnosis of non-progressive lesions  
(D) Reassurance of patients whose screening test is negative
16. Permissible annual radiation exposure limit for a radiation worker is :
- (A) 1 mSv (B) 10 mSv (C) 20 mSv (D) 100 mSv
17. Which of the following is **not** a mode of radioactive decay ?
- (A) Nuclear fusion (B) Positron emission  
(C) Electron capture (D) Alpha decay
18. The definitive treatment of gastric cancer is :
- (A) Surgery (B) Chemotherapy  
(C) Radiotherapy (D) Hormone therapy
19. Alpha rays emitted from a radioactive substance are :
- (A) Uncharged particles  
(B) Mass and charge equal to that of a proton  
(C) Negatively charged particle  
(D) Doubly ionized Helium atom



20. A radioisotope has a half life of 75 years. The fraction of atoms of this element that will decay in 150 years will be :  
 (A) 75%                      (B) 66.6%                      (C) 83.5%                      (D) 25%
21. The target material in an X-ray tube must have :  
 (A) High atomic number                      (B) Low melting point  
 (C) High mass number                      (D) High cost
22. Radionuclides are produced by :  
 (A) Nuclear fission                      (B) Nuclear reactor  
 (C) Cyclotron                      (D) All of the above
23. Background radiation is contributed by the following **except** :  
 (A) Terrestrial radiation                      (B) Cosmic radiation  
 (C) Ultraviolet rays                      (D) Radioactive elements in our body
24. All are teletherapy sources **except** :  
 (A) Cobalt 60                      (B) Cesium 137                      (C) Iridium 192                      (D) Radium 226
25. The following are electromagnetic radiation **except** :  
 (A) Characteristic radiation                      (B) Beta radiation  
 (C) Bremsstrahlung radiation                      (D) Annihilation radiation
26. Interactions of photons with matter include all **except** :  
 (A) Pair production                      (B) Leakage radiation  
 (C) Photoelectric effect                      (D) Compton scattering
27. X-ray beam quality depends on the :  
 (A) Accelerating voltage                      (B) Target material  
 (C) Inherent filtration                      (D) All of the above
28. D max for Cobalt 60 gamma rays is :  
 (A) 1.33 cm                      (B) 1.17 cm                      (C) 0.5 cm                      (D) 1.5 cm
29. Personal monitoring devices include all **except** :  
 (A) TLD                      (B) Film badge                      (C) Gun monitor                      (D) Pocket dosimeter



30. Advantage of diagnostic ultrasound over CT scan :
- (A) No harmful side effects                      (B) Relatively cheap  
(C) Non-invasive                                      (D) All of the above
31. Gamma rays are deflected in :
- (A) Magnetic field, but not in electric field  
(B) Electric field, but not in magnetic field  
(C) Both magnetic and electric fields  
(D) Neither magnetic nor electric fields
32. A radiotherapy simulator :
- (A) Uses X-rays for imaging                      (B) Uses Gamma rays for therapy  
(C) Is a brachytherapy machine                      (D) All of the above
33. Radiographic film is coated with gelatine layer containing :
- (A) Silver halide crystals                      (B) Silver sulphide crystals  
(C) Both of the above                      (D) None of the above
34. Radioisotopes used in brachytherapy include all **except** :
- (A) Iodine 131                                      (B) Cesium 137  
(C) Gold 198                                      (D) Radium 226
35. Beta rays emitted by a radioactive material are :
- (A) Neutral particles  
(B) Electrons orbiting around the nucleus  
(C) Charged particles emitted by nucleus  
(D) Electromagnetic radiations
36. Which of the following uses Gamma rays ?
- (A) Simulator                                      (B) Brachytherapy with iridium 192  
(C) LINAC                                      (D) IMRT
37. Principles of radiation protection include all **except** :
- (A) Time                      (B) Distance                      (C) Shielding                      (D) Monitoring

38. In photoelectric emission, the velocity of electrons ejected from near the surface is :
- (A) Same as those coming from interior of metal
  - (B) Less than those coming from interior of metal
  - (C) Larger than those coming from interior of metal
  - (D) None of the above
39. Radiation detecting instrument used in Nuclear Medicine :
- (A) Gamma knife
  - (B) Gamma camera
  - (C) Gamma zone monitor
  - (D) Cyber knife
40. Isotope of iodine used in PET :
- (A) I-123
  - (B) I-124
  - (C) I-127
  - (D) I-131
41. The half life of a radioactive element depends upon :
- (A) Amount of element present
  - (B) Temperature
  - (C) Pressure
  - (D) None of the above
42. Mantle field radiotherapy is used in :
- (A) Hodgkin's lymphoma
  - (B) Non-Hodgkin's lymphoma
  - (C) Breast cancer
  - (D) Thyroid cancer
43. Scintillation crystals used in clinical PET imaging include all **except** :
- (A) Bismuth germanium oxide (BGO)
  - (B) Gadolinium oxyorthosilicate (GSO)
  - (C) Sodium iodide (Thallium)
  - (D) Lutetium oxyorthosilicate (LSO)
44. A moderator is used in Nuclear Reactor in order to :
- (A) Accelerate the neutrons
  - (B) Slow down the speed of neutrons
  - (C) Increase the number of neutrons
  - (D) Decrease the number of neutrons



45. Pure Beta emitters include all except :
- (A) Phosphorous 32 (B) Iodine 123  
(C) Yttrium 90 (D) Strontium 89
46. Dose of palliative radiotherapy for brain metastases :
- (A) 30 Gy in 10 fractions (B) 40 Gy in 10 fractions  
(C) 60 Gy in 30 fractions (D) None of the above
47. Non-stochastic effect of radiation :
- (A) Epilation (B) Carcinogenesis  
(C) Genetic effect (D) All of the above
48. Cobalt 60 is produced from Cobalt 59 by :
- (A) Proton bombardment (B) Deuteron bombardment  
(C) Neutron bombardment (D) Electron bombardment
49. X-ray photons produced by an X-ray machine are :
- (A) Heterogeneous in energy (B) Homogeneous in energy  
(C) Both of the above (D) None of the above
50. Radioactivity is :
- (A) An irreversible process (B) Self disintegrative process  
(C) Spontaneous (D) All of the above
51. Linear accelerator is used in :
- (A) Contact therapy (B) Superficial therapy  
(C) Teletherapy (D) Grenz-Ray therapy
52. Which among the following is an electron accelerator ?
- (A) Microtron (B) Betatron  
(C) Linear Accelerator (D) All of the above
53. Bragg peak characteristic is utilized in :
- (A) Proton therapy (B) Neutron therapy  
(C) Megavoltage therapy (D) Electron therapy

54. Phase of cell cycle most sensitive to radiation :  
(A) M phase      (B) G1 phase      (C) S phase      (D) G2 phase
55. Directly ionizing radiation include :  
(A) Photons      (B) Electrons      (C) Neutrons      (D) None of the above
56. Photoelectric attenuation is :  
(A) Directly proportional to the cube of atomic number  
(B) Directly proportional to the square of atomic number  
(C) Inversely proportional to the square of atomic number  
(D) Inversely proportional to the cube of mass number
57. Minimum energy required for pair production :  
(A) 0.51 MeV      (B) 1.02 MeV      (C) 10.2 MeV      (D) 1.02 KeV
58. Electron interact with matter by :  
(A) Ionization      (B) Excitation  
(C) Both of the above      (D) None of the above
59. Ideal radionuclide for imaging should be :  
(A) Monoenergetic      (B) Having short half life  
(C) Pure Gamma emitter      (D) All of the above
60. Indirectly ionizing radiation include :  
(A) X-rays      (B) Gamma rays      (C) Neutrons      (D) All of the above
61. The unit of exposure is :  
(A) Curie      (B) Roentgen      (C) RAD      (D) Gray



62. Bolus is often used in electron beam therapy to :
- (A) Flatten out an irregular surface
  - (B) Reduce the penetration of electrons in parts of the field
  - (C) Increase the surface dose
  - (D) All of the above
63. Which among the following is **not** a permanent implant ?
- (A) Palladium 103      (B) Iodine 125      (C) Iridium 192      (D) Gold 198
64. Curable cancers include all **except** :
- (A) Carcinoma of vocal cord
  - (B) Seminoma testis
  - (C) Metastatic pancreatic carcinoma
  - (D) Lymphoma
65. The following are brachytherapy applications **except** :
- (A) Surface mold      (B) Interstitial therapy
  - (C) Intraoperative therapy      (D) Intracavitary therapy
66. Output of an X-ray machine is :
- (A) Proportional to kilovoltage
  - (B) Proportional to square of kilovoltage
  - (C) Inversely proportional to square of kilovoltage
  - (D) None of the above
67. Quality factor (radiation weighting factor) for Alpha particle is :
- (A) 1      (B) 4      (C) 5      (D) 20
68. Radiation Hormesis is :
- (A) Beneficial effect of radiation
  - (B) Terratogenic effect of radion
  - (C) Radiation protection parameter
  - (D) None of the above



69. Which among the following is stochastic effect of radiation ?  
(A) Fibrosis (B) Cataract  
(C) Genetic effect (D) Decrease in sperm count
70. Treatment of choice for small cell lung cancer :  
(A) Surgery (B) Radiotherapy  
(C) Chemotherapy (D) Hormonal therapy
71. NCRP recommended annual radiation exposure limit for trainee radiation worker :  
(A) 1 mSv (B) 5 mSv (C) 20 mSv (D) 50 mSv
72. Detectors most often used for X-ray measurements are :  
(A) Ionization chamber  
(B) Geiger counter  
(C) Thermo Luminescent Dosimeter (TLD)  
(D) All of the above
73. Spread of cancer occur by the following ways :  
(A) Local invasion (B) Lymphatic spread  
(C) Haematogenous spread (D) All of the above
74. Output of an X-ray machine :  
(A) Increases with tube current (B) Decreases with voltage  
(C) Increases with filtration (D) None of the above
75. Compton interaction is :  
(A) Directly proportional to the square of atomic number  
(B) Inversely proportional to the cube of atomic number  
(C) Independent of atomic number  
(D) None of the above
76. Highly radiosensitive tissue among the following is :  
(A) Muscle (B) Bone (C) Epidermis (D) Nerve