



# BRAINWARE UNIVERSITY

**Term End Examination 2021 - 22**

**Programme – Bachelor of Science in Physician Assistant**

**Course Name – Fundamental of Radiology and Imaging Technology**

**Course Code - BPA405**

**( Semester IV )**

**Time allotted : 1 Hrs.15 Min.**

**Full Marks : 60**

[The figure in the margin indicates full marks.]

## Group-A

(Multiple Choice Type Question)

1 x 60=60

*Choose the correct alternative from the following :*

- (1) For X-rays to travel
 

a) No medium required	b) Presence of water
c) Presence of oxygen	d) None
- (2) Soft X-ray have the tube voltage of
 

a) 0-10 kV	b) 20-60 kV
c) 150-400 kV	d) 400-3000 kV
- (3) The Aluminium filter used in the diagnostic X-ray tube is
 

a) For absorption of the low energy photons	b) For absorption of scattered photons
c) For absorption of high energy photons	d) None
- (4) Compound filter is made up of
 

a) Copper and aluminium	b) Copper and lead
c) Lead and aluminium	d) Aluminium and tin
- (5) Inherent filtration in X-ray tube is 0.5-1 mm of
 

a) Lead equivalent	b) Nickel equivalent
c) Aluminium equivalent	d) None
- (6) The size of actual focal spot as compare to effective focal spot is
 

a) Larger	b) Smaller
c) Equal	d) None
- (7) The “Heel effect” is
 

a) Higher on cathode side than anode side	b) Higher on anode side than cathode side
c) Equal on both on cathode and anode side	d) All

- (8) Anode “Heel effect can be used
- a) Thicker parts of the body towards cathode
  - b) Thicker parts of the body towards anode
  - c) No effect
  - d) All
- (9) Rhenium is added in anode tungsten because of
- a) High thermal capacity, thus prevent cracks
  - b) High conductivity
  - c) High atomic number
  - d) High melting power
- (10) X-ray beam when fall on the body, act as
- a) Reflected
  - b) Absorbed
  - c) Transmitted
  - d) All
- (11) In coherent scattering, the single electron is involved in interaction in
- a) Thompson scattering
  - b) Rayleigh scattering
  - c) Both
  - d) None
- (12) Compton scattering involve
- a) Moderate energy strikes outer shell electron
  - b) Energy of scattered photon is increased
  - c) Energy of scattered photon is increased
  - d) All
- (13) Pair production occur, if energy is of
- a)  $e^-$  &  $e^+$
  - b)  $e^-$  &  $e^-$
  - c)  $e^+$  &  $e^+$
  - d) Both a,b
- (14) Mass density of bone is
- a) 1850 kg/m
  - b) 320 kg/m
  - c) 910 kg/m
  - d) 1000 kg/m
- (15) Early causes of X-ray tube failure are
- a) Overheating
  - b) Mechanical damage of filament/glass envelope
  - c) Electric failure
  - d) Any
- (16) The X-ray tube said to be “gassy” when
- a) Filament has burnt out
  - b) Presence of the gas molecule
  - c) Pitting of the anode
  - d) None
- (17) “Gassy tube” is diagnosed by any one of the following
- a) No exposure
  - b) mA meter does not move
  - c) mA meter shows fluctuation
  - d) mA meter shows full deflection during exposure
- (18) In rotating anode tube, heat produced in target, contribute to incident energy equal to
- a) 0.7
  - b) 0.8
  - c) 0.9
  - d) 1
- (19) Filament in X-ray tube emits electron by process
- a) Space charge effect
  - b) Thermionic emission
  - c) oth
  - d) None
- (20) The current in X-ray tube range between
- a) 1-100 mA
  - b) 1- 300 mA
  - c) 1-500 mA
  - d) 1-1000 mA
- (21) During fluoroscopy, the X-ray tube operates at

- a) Less than 5 mA  
b) 10-15 mA  
c) 25-35 mA  
d) Above 60 mA
- (22) X-ray tube output is increased most strongly by increasing the  
a) Voltage across the tube (kVp)  
b) Anode diameter  
c) Atomic number of the target  
d) Filtration
- (23) X-ray tubes are surrounded by \_\_\_\_\_ to absorb unwanted radiation  
a) Lead  
b) Glass  
c) Aluminium  
d) Oil
- (24) X-rays are emitted  
a) From electrons cloud of an atom that has stimulated artificially  
b) From inside the electrons of a radioactive atom  
c) Both  
d) None
- (25) Quality of radiation depends on  
a) mAs  
b) kVp  
c) Sec  
d) Both a,b
- (26) Function of the grid to  
a) Absorb scatter radiation  
b) Transmit all primary radiation  
c) Both  
d) None
- (27) The effective device to reduce the scattered radiation is  
a) Grid  
b) Glass tube  
c) Diaphragm  
d) Cone
- (28) Grid lines appear on radiograph with  
a) Stationary grid  
b) Moving grid  
c) Both  
d) None
- (29) The function of the cone in skull radiography is  
a) To limit the field of the radiation  
b) To reduce the exposure  
c) To increase the life of the X-ray tube  
d) All
- (30) Grid ratio is the  
a) Height of lead strip by distance between them  
b) Distance between lead strips by height  
c) Height of the lead strip multiplied by the distance  
d) None
- (31) Grid are generally used in  
a) Fatty person  
b) Thin person  
c) Children  
d) Pregnant women
- (32) The bucky factor \_\_\_\_\_ with increasing kVp.  
a) Increases  
b) Decreases  
c) Halves  
d) Quarter
- (33) High ratio grids are used for \_\_\_\_\_ examination.  
a) Low kVp  
b) High kVp  
c) Both  
d) None
- (34) High frequency generator has  
a) High tube current with short exposure  
b) More efficient

- c) Ripple factor is minimum  
 (35) X-ray generator provides  
 a) Electric power to energize X-ray tube  
 c) To protect X-ray tube from possible overload situation
- d) All  
 b) Mechanism to select technique appropriate for a given examination  
 d) All
- (36) Gas filled X-ray tube have  
 a) 2 Conductor H.T cable  
 c) 3 conductor H.T cable
- b) 1 Conductor H.T cable  
 d) 5 conductor H.T cable
- (37) Electric current is measured in  
 a) Watt  
 c) Volt
- b) Erg  
 d) Ampere
- (38) The radiation unit to record the radiation received by radiation worker  
 a) Roentgen  
 c) Curie
- b) Radiation  
 d) mSv
- (39) GM type meters mainly used as  
 a) Radioactivity  
 c) radioactive contamination
- b) Absorb dose  
 d) Effective dose
- (40) NaI detector is which type of detector  
 a) Scintillation  
 c) Ion-chamber
- b) Gas filled  
 d) All
- (41) Who discovered X-ray  
 a) Godfrey Hounsfield  
 c) Raymond Damadian
- b) W.C. Röntgen  
 d) None of these
- (42) What are X-ray  
 a) Electro megnatic Wave  
 c) Electric wave
- b) Megnatic wave  
 d) All of these
- (43) Why tungsten is used in x ray tube  
 a) For high melting point  
 c) for low atomic number
- b) For low melting point  
 d) For low mass number
- (44) Dental X-Ray is also known as \_\_\_\_\_  
 a) Orthopedics  
 c) Orthology
- b) Orthopentology  
 d) Orthopantomography
- (45) The X-Ray is recorded on a plate coated with \_\_\_\_\_  
 a) Gold Halide  
 c) Copper Halide
- b) Silver Halide  
 d) Iron Halide
- (46) Clssify the use of rotatting anode  
 a) For heat dissipation  
 c) FOR Electric wave generation
- b) for heat generation  
 d) Non of these
- (47) Drinking radioactive Barium solution helps look at the \_\_\_\_\_  
 a) Respiratory Tract  
 c) Neural Tract
- b) Gastrointestinal Tract  
 d) Thorax

- (48) Which another method can be used to look in the compete for GI tract?
- a) Endoscopy  
b) Capsule Endoscopy  
c) Colonoscopy  
d) Laryngoscopy
- (49) How many bones does an adult human skeleton have?
- a) 206  
b) 207  
c) 208  
d) 209
- (50) Which of the following part of human skeleton forms the helmet for the protection of human brain?
- a) Cranium  
b) Temporal bone  
c) Hyoid  
d) Mandible
- (51) CAT scan is essentially \_\_\_\_\_
- a) a finer X-ray of bones  
b) a detailed x-ray  
c) x-ray of soft tissues  
d) x-ray of brain
- (52) CAT scan is often combined with \_\_\_\_\_
- a) PET  
b) SPECT  
c) Fluoroscopy  
d) MRI
- (53) Why is contrast used in CT scan?
- a) To suppress particular tissues  
b) To enhance a particular tissue  
c) To ensure correct tissue is being imaged  
d) To reduce bone interference
- (54) The current generation CT scanner use \_\_\_\_\_ for scanning
- a) pencil beam and stationary detectors  
b) pencil beam and rotating detectors  
c) fan beam and detectors  
d) electron beam and detectors
- (55) Why pressure injector used in CT
- a) For injecting IV contrast  
b) For injecting BaSo4  
c) For pumping blood  
d) None of these
- (56) Ultrasound is also useful for \_\_\_\_\_ i. detecting fault in metal sheets ii. imaging marine depths iii. looking for metals beneath the earth's surface iv. detecting distances v. detecting earthquakes
- a) ii, iii, v  
b) i, iv, v  
c) i, ii, iv  
d) ii, iii
- (57) Which of the following medical imaging modality other than ultrasound does not use any form of radiation?
- a) PET Scan  
b) SPECT Scan  
c) CT Scan  
d) MRI
- (58) For which of these areas can the ultrasound be taken for an infant but not for an adult?
- a) Cranium  
b) Chest  
c) Arms  
d) Legs
- (59) A piezoelectric crystal is used to produce the ultrasound waves. What kind of ultrasound is produced?
- a) Pressure wave ultrasound  
b) Electrical wave ultrasound  
c) Sound wave ultrasound  
d) Simple ultrasound
- (60) What is the effective dose limit for general public
- a) 3 miliseiverts per year  
b) 1 milisievert per year

c) 20 miliseiverts per year

d) None of the above