BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science in Medical Radiology & Imaging Technology

Course Name – Modern Radiological &Imaging Equipment

Course Code - BMRIT304

Semester / Year - Semester III

Time allotted : 75 Minutes Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 60=60

1. *(Answer any Sixty)*

(i) The X-ray tube use in portable machine is

a) Self-rectified b) Full-wave rectified

c) Half-wave rectified d) None of these

(ii) The anode use in portable X-ray tube is

a) Rotating anode b) Stationary anode

c) Both d) None of these

(iii) What is the maximum output of portable machine

a) 90 KVp,10 mA,1 sec b) 80 KVp,15 mA, 1 sec

c) 70 KVp,15 mA,2 sec d) 90 kVp,15 mAs,1 sec

(iv) The anode use in mobile X-ray tube is

a) Single focus rotating anode b) Dual focus rotating anode

c) Dual focus stationary anode d) Single focus stationary anode

(v) Fine spot size of mobile X-ray tube anode is

a) 1.0mm b) 2.0mm

c) 0.5mm d) 0.25mm

(vi) Broad spot size of mobile X-ray tube anode is

a) 1.0mm
b) 1.5mm
c) 0.5mm
d) 2mm

(vii) What is the maximum output of high power mobile X-ray

a) 300 mA, 125KVp
b) 200 mA, 125KVp
c) 100 mA, 90KVp
d) 100 mA, 100KVp

(viii) Rectifier used in mobile X-ray tube is

a) Self-rectifier
b) Full-wave rectifier
c) Half-wave rectifier
d) None of these

(ix) Heel effect increases with

a) Short SID
b) Long SID
c) Both
d) None of these

(x) As mAs increases

a) Exposure time decreases
b) Exposure time will not change
c) Exposure time increases
d) None of these

(xi) The source to image distance is used in mammography

a) 60-80 cm
b) 100 cm
c) 50-55 cm
d) 80 cm

(xii) The function of amorphous selenium photoconductor in digital mammography is

a) X-ray into light
b) Light into digital signal
c) X-ray into digital signal
d) All

(xiii) Molybdenum is the most common filter material in mammographic system. It is used because it produces:

a) Characteristic radiation.
b) Increased breast penetration.
c) High absorption above the K-edge energy.
d) High absorption below the K-edge energy.

(xiv) What does CR mean?

a) Computed Tomography
b) Computerized Radiography
c) Computed Radiography
d) Computer Radiography

(xv) What is a scintillator?

a) Absorbs light and converts energy to x-rays
b) Absorbs light and converts to light
c) Absorbs x-rays and converts energy to light
d) Absorbs x-rays and converts to carbon

(xvi) What are the layers of a CR Imaging Plate?

a) Protective, Conducive, Reflective, Protective, Intensifying screen
b) Protective, phosphor, conductor, support, shield, backing
c) Protective, phosphor, reflective, support
d) Phosphor, conductive, support, reflective, intensifying screen

(xvii) The PSP material mostly used in CR is

a) CsI
b) NaI
c) a-Se
d) BaFX:Eu2+

(xviii) What is a PSP?

a) Photodiode Stimulator
b) Photostimulable x-ray table
c) Photodiode Phosphor plate
d) Photostimulable Phosphor Plate

(xix) In DR, where are the electrical charges stored?

a) Thin Plate Transistors TPTs
b) Titanium Film Transistors TFTs
c) Thin Film Transistors TFTs
d) Thin Photodiode Transistors TPTs

(xx) What does DICOM mean?

a) Digital imaging and contrast manufacturing

b) Digressive communications imaging

c) Digital imaging and communications in medicine

d) digital imaging and contrast in medicine

(xxi) With regard to computed radiographic (CR) imaging:

a) Images with the same CR exposure index are all obtained with the same radiation dose to the patient.

b) An automatic exposure control (AEC) is not required.

c) Unlike photographic film, CR plates are impervious to “fogging” by background radiation during storage.

d) Good quality diagnostic images can be acquired with radiation exposures which are similar to those required for film/screen imaging.

(xxii) Pulsed fluoroscopy is generally used to:

a) Reduce motion blur.

b) Reduce patient dose.

c) Reduce the effective focal spot size.

d) Increase kVp stabilization.

(xxiii) In digital subtraction angiography (DSA), video cameras are generally used in the progressive scan mode. This implies:

a) Repeated scanning of the same video image to improve signal-to-noise ratio.

b) Scanning adjacent raster lines sequentially after termination of the X-ray exposure.

c) Scanning the video camera target at appropriate intervals during the X-ray exposure.

d) Use of a double interlaced vidicon beam.

(xxiv) Processing a digital radiograph using Unsharp Masking increases the:

a) Patient dose.

b) Image magnification.

c) landmarking.

d) Visualization of edges.

(xxv) What does Digital Imaging require?

a) Hardware & Software applications to process images

b) Systematic application of highly complex mathematical formulas called Algorithms

c) Film

d) Both (Hardware & Software applications to process images) and (Systematic application of highly complex mathematical formulas called Algorithms)

(xxvi) Contrast can be modified in

a) Conventional radiography

b) Fluoroscopy

c) None

d) Digital radiography

(xxvii) Computed Tomography (CT) results in a/an

a) Analog image

b) Linear image

c) Digital image

d) Image in time

(xxviii) The principal advantage of CT over projection radiography is

a) Speed of image acquisition

b) Energy resolution

c) Contrast resolution

d) Spatial resolution

(xxix) Which of the following terms does not fit?

a) Section

b) Slice

c) Tomos

d) Volume

(xxx) Computed tomography is otherwise identified as

a) Emission tomography

b) Transmission tomography

c) Reflection tomography

d) Volumetric tomography

(xxxi) When compared to projection radiography, conventional tomography shows

a) Better spatial resolution

b) Improved contrast resolution

c) Reduced patient dose

d) Relaxed quality control

(xxxii) Which of the following scientists received the nobel prize for their work leading to CT? 1. Alan Cormack 2. Raymond Damadian 3. Geodfrey Hounsfield 4. Paul Lauterbur

a) Only 1,2 and 3 are correct

b) Only 1 and 3 are correct

c) Only 2 and 3 are correct

d) Only 4 is correct

(xxxiii) Which of the following are characteristic limitations of CT? 1. Spatial resolution 2. Artifact generation 3. Z-axis resolution 4. patient dose

a) Only 1, 2, and 3 are correct

b) Only 1 and 3 are correct

c) Only 2 and 4 are correct

d) Only 4 is correct

(xxxiv) The term "projection" when applied to CT, refers to

a) Speed of image acquisition

b) A data set representing x-ray attenuation in the patient

c) The size of the x-ray beam projected on the patient

d) The shape of the x-ray beam projected on the patient

(xxxv) Which of the following image modalities are likely to have lsess scatter radiation affecting the image?

a) Fluoroscopy

b) Projection of radiography

c) Conventional tomography

d) CT

(xxxvi) The first CT image was demonstrated by

a) Alan Cormack

b) Raymond Damadian

c) Geodfrey Hounsfield

d) Frank Lauterbur

(xxxvii) Compared to projection radiography, conventional tomography results in improved contrast resolution because

a) Imaging time is reduced

b) Out of plane tissues are blurred

c) The x-ray beam is selectively filtered

d) All of these

(xxxviii) CT stands for

a) Controlled tomography
b) Computed tomography
c) Converted tomography
d) Comparison tomography

(xxxix) Who invented Tomography?

a) Radon
b) Josef capek
c) Curie
d) Johnson

(xl) Which of the following is used in tomography?

a) Gamma ray
b) IR radiation
c) UV ray
d) X ray

(xli) ECT stands for

a) Electro cardio tomography
b) Electro capacitive tomography
c) Electro converging tomography
d) Electro Cornial tomography

(xlii) The substratum layer or binding layer is made-up

a) Silver bromide crystals
b) Gelatin plus acetone and water
c) Gelatin
d) None of these

(xliii) Angiography is the study of

a) Vein
b) Artery
c) None
d) All

(xliv) Venography is the study of

a) Vein
b) Artery
c) All
d) None

(xlv) Lower extremity angiography refers to which part of the body

a) Leg
b) Hand

c) Abdomen d) None

(xlvi) Upper extremity angiography refers to which part of the body

a) Hand b) Leg

c) Abdomen d) All

(xlvii) Rare earth screen are all except of the following

a) Lanthanum oxybromide b) Lanthanum oxysulphide

c) Calcium tungstate d) Gadolinium oxysulphide

(xlviii) Which of the following phosphor not used in intensifying screen

a) Calcium tungstate b) Zinc cadmium sulfide

c) Terbium d) Thulium blue

(xlix) Grid doesn't remove_____?

a) Scattered X-rays b) No x-ray

c) Primary x-ray d) X-ray

(l) Contrast is the degree of difference in_____?

a) Optimal distance b) Optimal Visuality

c) Optimal Clearance d) Both Optimal distance & Optimal Clearance

(li) Which is not true when using intensifying screens

a) Improve film gamma b) Improves quantum mottle

c) Resolution is less d) Base is made-up of card board

(lii) Phosphorescence signifies

a) Light emitted by screen within 10-8 sec b) Light emitted by screen after 10-8 sec

c) Light emitted by screen at 10-8 sec d) None

(liii) Trouble shooting of the cassette includes warped cassette front, sprung or cracked cassette frame and what else

a) Loose, bend, broken hinges
b) Loose, bend, broken latches
c) Both (Loose, bend, broken hinges) & (Loose, bend, broken latches)
d) None of these

(liv) What does rinsing do?

a) Remaining chemicals are washed from the film
b) Removes excess developer from the emulsion; stops the development process
c) Film is dried to remove the water and make it acceptable for handling and viewing
d) Silver halide that was not exposed to radiation is dissolved and removed from the emulsion

(lv) Closest to x-ray film. 10-20 um thick

a) Phosphor layer
b) Base
c) Reflexive layer
d) Protective layer

(lvi) In IVU, scout film is taken

a) To check the exposure factors
b) To check bowel preparation
c) To see any calculus
d) All of these

(lvii) 1 F = _____

a) 0.0131 inch
b) 0.254 inch
c) 0.314 inch
d) 0.894 inch

(lviii) After how much of a bolus injection, arterial phase begins for CT abdomen

a) 50 s
b) 100 s
c) 25 s
d) 7 s

(lix) Following is a cholangiographic agent

a) Meglumine
b) Urografin

c) Barium

d) Iopamidol

(lx) Normal liver shows

a) Increased T1 signal

b) Increased T2 signal

c) Decreased T1 signal

d) Decreased T2 signal