BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Bachelor of Science in Medical Radiology & Imaging Technology
Course Name – Radiographic Techniques of Advanced Imaging Technology
Course Code - BMRIT503
(Semester V)

Time : 1 Hr.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) Duration between two 90 degree excitation pulse is known as:
a) TR b) TE
c) IR d) TI

(2) Short TE and short TR is use for
a) T1-weighted images b) T2-weighted images
c) PD-weighted images d) All

(3) Contrast media used for CECT brain:
a) Gastrografin b) Gadolinium
c) Omnipaque d) None

(4) Which of the following is use for PD image
a) Short TE, Short TR b) Long TE, Short TR
c) Long TE, Long TR d) Short TE, Long TR

(5) High resolution CT is most commonly used for the evaluation of the
a) Pancreas b) Brain
c) Lung d) Mediastinum

(6) Which of the following sets of section widths and spacing is the most suitable for a general survey CT of the neck?
a) 1.5 mm thick every 1.5 b) 3mm thick every 5mm
c) 5mm thick every 5mm d) 10mm thick every 10mm

(7) The _____ gland is located in the AP portion of the mediastinum and is often identified with CT when scanning younger PT's
a) Thyroid b) Luschka
c) Thymus d) Parathyroid

(8) Which of the following CT Studies of the head may be performed W/O contrast?

a) CT angiogram for the Circle of Willis
b) Coronal CT scan to rule out pituitary tumor
c) CT of the brain to r/o hematoma
d) CT of the brain to r/o metastatic disease

(9) The Kidneys are located anatomically between which vertebrae.

a) T6 and L2
b) T12 and L3
c) L2 and L4
d) L3 and S1

(10) Which of the following types of pathologic conditions cannot be easily diagnosed from a CT Scan of the brain?

a) Astrocytoma
b) Traumatic herorrhage
c) Cerebral infarct
d) Alzheimers disease

(11) In order to visualize the flow of blood in the renal arteries, what process is done with CT?

a) CT Angioplasty
b) CT Angiography
c) Simple CT
d) CT Cardiography

(12) The matrix size describes which of the following

a) Aperture size used during data acquistion
b) Number of pixels used to display an image
c) Relationship between the FOV and algorithm
d) None

(13) Full form of TOF

a) Toe of flight
b) Time of flight
c) Time of field
d) None

(14) what is hematuria

a) Blood in ureter
b) Blood in kidney
c) Blood in urine
d) None

(15) What matrix size is use for T2 tse axial sequence in MRI Brain

a) 512X512
b) 320X320
c) 256X256
d) 320X256

(16) Increasing the magnetic field?

a) produuces less susceptibility artifacts
b) Reduces the risk of tissue heating.
c) Increase the signal to noise.
d) Reduces the danger from metallic projectiles.

(17) Which of the following is true

a) MRI is superior to CT at demonstrating extra cerebbral fluid collections
b) Acute cerebbral haemorrhage (<3days)
c) Old cerebral haematoma(weeks to months) will appear hypointense on T2 weighted MRI with a thin rim of hyperintensity.
d) All options are false

(18) PD fat sat axial for knee planned on

a) Coronal plan
b) Axial plan
c) Sagittal plan
d) None

(19) Which of the following medical imaging modality other than ultrasound does not use any form of radiation?

a) CT Scan
b) PET Scan
c) SPECT Scan
d) MRI

(20) Identify the sequence Long TR and TE

a) T2
b) T1
c) GRE
d) STIR

(21) In a brain scan of a person suffering/suspected of suffering from schizophrenia, the brai n _____

a) has gray matter which more than normal
b) has white matter which more than normal
c) is of a size bigger than normal
d) has shrunk

(22) Select one of the following objects that you think would alwasy be safe in the MRI suit e.

a) A wheelchair
b) A stretcher
c) Scissors
d) None of the listed

(23) A major advantage of MRI is

a) the ease with which equipment is updated or replaced.
b) its relatively low cost, compared to CT scan s.
c) dose not require specialized room
d) the ability to reposition the 'cross-section' th rough the body without repositioning the pat ient.

(24) How is proton-density weighting achieved?

a) Short TR, long TI
b) Long TI, short TE.
c) Short TR, short TE
d) Short TE, Long TR

(25) What is Zeeman splitting?

a) The formation of energy eigenstates as a resu lt of the quantization of angular momentum, in the presence of an external magnetic field.
b) The transition between the spin up and spin down states of nuclear spins, in the presence of an external magnetic field.
c) Magnetic Resonance Imaging
d) Maximal Radiology Imaging

(26) What does PRECESSION mean?

a) The spinning of Hydrogen protons around th eir own axis
b) Change in orientation of Hydrogen molecule s when exposed to radiowaves at the Larmor frequency
c) The wobble of Hydrogen protons exposed to a large magnetic field
d) Water molecules gain an extra molecule of H ydrogen when exposed to a magnetic field

(27) Which of these are different colours on T1 and T2 weighted MRI images?

a) Cortical bone
b) Flowing blood
c) Fat
d) None of the listed

(28) Compared with spin echo (SE), the gradient echo (GRE) sequence

a) Has a 180-degree pulse and demonstrates T2 * dephasing
b) Has no 180-degree pulse and demonstrates T 2* dephasing
c) Has a 180-degree pulse and demonstrates T2 dephasing
d) Has no 180-degree pulse and demonstrates T 2 dephasing

(29) Compared with SE, GRE sequences use

a) Longer TR and longer TE
b) Shorter TR and longer TE
c) Longer TR and shorter TE
d) Shorter TR and shorter TE

(30) Echo planar imaging (EPI) is most commonly used in

a) Vascular imaging
b) Routine T2-weighted imaging
c) Post-contrast T1-weighted imaging
d) Diffusion-weighted imaging

(31) In order to select a slice for excitation, the MR scanner

a) Tunes the frequency of the excitation pulse
b) Tunes the phase of the excitation pulse
c) Tunes the magnetic field of the excitation pu
d) Tunes the spacing between the excitation an

lse

d refocusing (180-degree) pulses

(32) The most signal in K-space is present

a) In the center
b) In the periphery
c) Along the frequency-encoding axis
d) Along the phase-encoding axis

(33) SNR in MRI is improved by increasing:

a) Resolution
b) Bandwidth
c) Gradient strength
d) Acquisition time

(34) The spacing of lines in k-space corresponds to

a) Resolution
b) Number of excitations
c) Matrix size
d) Field of view

(35) Radiofrequency contamination artifact causes:

a) Ghosting" of multiple copies of structures
b) Diagonal lines across the image
c) Random noise across the image
d) Line(s) parallel to the phase-encoding axis

(36) In order to measure recovery in the longitudinal axis (T1 relaxation), an MR scanner m easures:

a) Signal in the longitudinal axis (z-axis, along B0)
b) Signal in the transverse plane (xy-plane)
c) Proton precession frequency
d) Local magnetic field

(37) A tumor that enhances with gadolinium contrast is bright on T1-weighted images beca use

a) Gadolinium chelates slow T1 recovery of wa ter molecules by interacting with the water a nd changing the rotational speeds of the hydr ogen atoms
b) Gadolinium has a short T1 value
c) The hydrogen atoms in the chelation groups of the contrast agent have a short T1 value
d) Gadolinium chelates speed T1 recovery of w ater molecules by interacting with the water and changing the rotational speeds of the hy drogen atoms

(38) Increasing B0 affects the T1 value of water in what way?

a) Longer T1
b) Shorter T1
c) Does not change T1
d) Only changes T1 of water-protein mixtures

(39) T2-weighted images are often referred to as "water-sensitive" because

a) The presence of water alters the rotation spe eds of the normal tissue
b) Water molecules have very long (slow) T2 re laxation
c) Water molecules have very short (long) T2 r elaxation
d) Trick question - T2-weighted images are not water sensitive

(40) Inversion-recovery (IR) sequences are helpful to

a) Improve T2 weighting
b) Improve signal-to-noise (SNR)
c) Shorten imaging time
d) Improve tissue contrast

(41) To null the signal from a particular tissue with an IR sequence, TI should be chosen bas ed on

a) The proton density of the tissue
b) The T1 value of the tissue
c) The T2 value of the tissue
d) The T2* value of the tissue

(42) The diffusion weighting in DWI images is created by means of

a) Two balanced gradients spaced in time
b) Triphasic flow compensation gradients
c) An inversion pulse
d) Two inversion pulses

(43) ADC maps negate T2 shine-through by

a) Using multiple directions of diffusion gradie nts

b) Using multiple intensities of diffusion gradie nts

c) Averaging multiple acquisitions of diffusion

d) Using a different pulse sequence to acquire d iffusion

(44) 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

(45) Hounsfield number of Bone is

a) 700-3000

b) 100

c) 0

d) -1000

(46) Hounsfield number of Water is

a) 0

b) 1000

c) -1000

d) 100

(47) Hounsfield number of Blood is

a) 30 to 35

b) 10 to 30

c) 100 to 200

d) 1000

(48) Hounsfield number of liver is

a) 10 to 20

b) 40 to 60

c) 100 to 120

d) None

(49) The axial resolution will increases in USG as the

a) Frequency of transducer increase

b) Frequency of transducer decrease

c) All

d) None

(50) In USG B mode is also called as

a) Amplitude mode

b) Brightness mode

c) Motion mode

d) None

(51) Acute stroke can be diagnosed by which of the following modalities

a) CT

b) MRI

c) USG

d) A and B both

(52) Normal Range of serum creatinine in adult

a) 0.74 to 1.35 mg/dL

b) 2.74 to 3.35 mg/dL

c) 1.74 to 1.35 mg/dL

d) 3.74 to 7.35 mg/dL

(53) Inflammation of the intestines, such as Crohn's disease can be better evaluated in whic h modalities?

a) CT Abdomen

b) MRI Abdomen

c) Adomen X-ray

d) None

(54) Mode of contrast media administration used for CECT W/A

a) Oral

b) Rectal

c) IV

d) All

(55) In which case contrast media shoul not use for CT

a) Acute traumatic brain injury

b) SOL

c) Mass lesion

d) None

(56) Slip ring brushes are made up of

a) Tungsten

b) Cobalt

c) Nickle
d) Silver graphite

(57) SSD images are used in

a) Bone imaging
b) Angiography
c) CT fluoroscopy
d) CECT head

(58) Who developed the mathematics used to reconstruct the CT images?

a) Godfrey Hounsfield
b) Alan Cormack
c) Paul Lauterberg
d) W C Roentgen

(59) In currently available CT scanner, K has a value of

a) 100
b) 1000
c) 10000
d) 1000000

(60) The range of CT number above and below the window level is called the

a) Window level
b) Window width
c) Window slice
d) All of these