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SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
THIRUVANANTHAPURAM—695 011

ENTRANCE EXAMINATION - ACADEMIC SESSION JANUARY 2022

Program: Diploma in Advanced Medical Imaging Technology (DAMIT)

Time:90 Minutes

Max.Marks: 100

(Select the most appropriate answer)

(There are **no negative** marks for wrong answers)

1. One application of MRI is "MRA", which stands for:
 - a. Magnetic Resonance Angiography
 - b. Medical Research Assistance
 - c. Magnetic Resonance Amplification
 - d. Magnetic Resonance Applications
2. SI unit of radiation absorbed dose
 - a. Bq
 - b. Sv
 - c. Gy
 - d. R
3. In MRI, Increasing the magnetic field strength?
 - a. produces less susceptibility artifacts
 - b. Reduces the risk of tissue heating
 - c. Increases the signal to noise
 - d. Reduces the danger from metallic projectiles
4. Functional MRI uses the principle of
 - a. Susceptibility weighted imaging
 - b. Diffusion tensor imaging
 - c. Blood oxygen level dependent
 - d. T2 relaxometry
5. In the adult, the spinal cord usually ends at the level of which vertebra?
 - a. L1
 - b. S1
 - c. L5
 - d. S3

6. The cochlea is located within the?
 - a. Frontal bone
 - b. Occipital bone
 - c. Temporal bone
 - d. Sphenoid bone
7. The superior mesenteric artery arises commonly from the?
 - a. Coeliac axis
 - b. Hepatic artery
 - c. Abdominal aorta
 - d. Splenic artery
8. The coronary sinus drains into the?
 - a. SVC
 - b. Rt. Atrium
 - c. Lt. atrium
 - d. Pulmonary vein
9. The cribriform plate of the ethmoid bone is for the passage of which of the cranial nerves?
 - a. 1st
 - b. 2nd
 - c. 3rd
 - d. 5th
10. What is most appropriate about Gadolinium DTPA?
 - a. Acts by Shortening the T1 relaxation time
 - b. Acts by shortening the T2 relaxation time
 - c. Chelates with the ionic substances in blood
 - d. Can be used safely in renal failure
11. Diffusion- perfusion mismatch calculation is done
 - a. To detect the tumor cellularity in brain tumor
 - b. In all patients with stroke
 - c. Useful in acute stroke management
 - d. As a part of acute CT protocol
12. The international standard to transmit and store images is
 - a. Health level Seven International
 - b. Digital Imaging and Communications in Medicine
 - c. ACR-NEMA 300
 - d. International Electronic Medical Record
13.is the mathematical space for storage of the measured raw data before the MR image is reconstructed by applying 2D or 3D Fourier transform.
 - a. F space
 - b. MR space
 - c. K space
 - d. D space

14. During discovery of X-ray, Roentgen was working in
 - a. University of Petersburg
 - b. University of Wurzburg
 - c. University of Johannesburg
 - d. University of Vermonte
15. The regulatory board for radiation installations in India is
 - a. Bhabha Atomic Research Centre
 - b. Board of Radiation and Isotope Technology
 - c. Atomic Energy Regulatory Board
 - d. Indian Association of Medical Physicists
16. The addition of thorium to tungsten filament
 - a. Increases filament life
 - b. Decreases the space charge effect
 - c. Reduces the saturation current
 - d. Increases efficiency of thermionic emission
17. One Gray (Gy) equals
 - a. 1/100 of rad
 - b. 1/110 of rad
 - c. 10 rads
 - d. 100 rads
18. All the following software are used for functional MRI data processing except
 - a. Statistical parametric mapping
 - b. Presentation
 - c. AFNI
 - d. Brain Voyager
19. 3D FLAIR in epilepsy protocol is good for picking up
 - a. Focal cortical dysplasia
 - b. Vascular malformation
 - c. Bleed
 - d. Calcification
20. Which of the following sequences can be used to estimate the iron deposition in the brain
 - a. Multi shot Echo-planar diffusion imaging
 - b. Susceptibility weighted imaging
 - c. Single shot EPI diffusion imaging
 - d. MR spectroscopy
21. A technique that is very good in picking up acute stroke very early in MRI is
 - a. MR Angiography
 - b. SWI
 - c. DWI
 - d. Gradient echo

22. Selective tin filter is used in
- High KVP technique
 - Grid controlled x-ray tubes
 - Dual energy CT
 - Mammography
23. If the rotation time (TI) of a dual source detector is 300 ms . Then the temporal resolution of the scanner if using 180 interpolation algorithm will be
- 300ms
 - 150 ms
 - 75 ms
 - 600 ms
24. Which of the following is a fat suppression technique in MRI
- TRICKS
 - mDIXON
 - MEDIC
 - TOF
25. Grid controlled tubes are used in
- Mammography
 - Scanometry
 - CT scan
 - Fluroscopy
26. Rhees view is to visualize
- pituitary fossa
 - optic canal
 - mastoids
 - maxillary floor
27. Specific absorption rate in MR is NOT related to
- strength of MR
 - Weight of patient
 - flip angle
 - Repetition time (TR)
28. Off resonance artifacts in MRI is maximum seen in
- Spin echo sequence
 - Hybrid EPI
 - Spoiled gradient echo
 - Steady state gradient echo
29. TLD needs to be renewed every
- 2months
 - 3months
 - 6months
 - Yearly

30. SENSE is a technique used in MRI for
- Artifact reduction
 - Parallel imaging
 - Flow quantification
 - Spectroscopy.
31. The Zerolead apron is mainly made of
- Carbon
 - Antimony
 - Thin lead
 - Tungsten
32. Swimmers view is used in radiography of
- Hip joint
 - Pelvis
 - Knee joint
 - Cervical spine
33. The usual KVp used in x-ray for DR system is
- 80
 - 100
 - 120
 - 140
34. The element used in direct conversion flat panel detector is
- Silicon
 - Selenium
 - cadmium tungstate
 - Gadonilium
35. The threshold for exposure to eye according to new guidelines by NRCp is (in mSV)
- 20
 - 100
 - 150
 - 200
36. Nephrogenic systemic fibrosis is a side effect of
- iodine contrast agents
 - gadolinium contrast agents
 - Barium contrast agents
 - Barium contrast agents
37. Which of the following is not a relative contraindication for MRI
- cochlear implant
 - cardiac pacemakers
 - ventricular-peritoneal shunts
 - intra-cardiac defibrillators
38. The tube film distance in chest radiograph PA view is
- 100cm
 - 150cm
 - 180cm
 - 210cm

39. Straton tube is used in
- CT
 - DSA
 - Mammography
 - DR system
40. Renal function tests are to be done prior to
- Non contrast MRI
 - Plain CT
 - IVU
 - Barium Swallow
41. Air gap technique is used to reduce the effect of
- Photoelectric effect
 - Compton effect
 - Pair production
 - Dielectric effect
42. Ripple factor is
- X-ray exposure rate per second
 - The variation in the voltage across the tube
 - AC voltage frequency
 - The variation in the tube current across the tube
43. Which of the following devices functions to produce hard copies of digital images?
- Digitizer
 - Laser printer
 - Histogram
 - Display monitor
44. Changes in window width in digital imaging result in changes in
- Contrast
 - Density
 - Resolution
 - Distortion
45. Which of the following is used to evaluate focal spot size?
- Spinning top
 - Wire-mesh
 - Slit camera
 - Penetrometer
46. When reviewing patient blood chemistry levels, what is considered the normal creatinine
- 0.6–1.2 mg/100 mL
 - 8–25 mg/100 mL
 - 4.5–6 mg/100 mL
 - up to 50 mg/100 mL

47. The input phosphor of the image intensifier tube functions to convert
- kinetic energy to light
 - x-ray to light
 - x-ray to electrons
 - electrons to light
48. The photoelectric process is an interaction between an x-ray photon and
- An inner shell electron
 - An outer shell electron
 - A nucleus
 - Another photon
49. Usual frequency of ultrasound in diagnostic imaging is
- 2-20Mhz
 - 20-40 MHz
 - 40-60 MHz
 - 60 -100 MHz
50. Law of Beer–Lambert used in the image formation of
- CT
 - MRI
 - DSA
 - Ultrasound
51. Material Differentiation with Spectral Energy Resolution is possible in all except
- Multi slice CT
 - Dual source
 - Rapid KV switching
 - Multilayer detector
52. Which of the following is not a CT perfusion parameter
- Mean transit time
 - Modulation transfer function
 - Time to peak
 - Blood volume
53. Scan time of an MRI sequence is
- $TR \times \text{number of excitations} \times \text{number of phase encodings}$
 - $TR + \text{number of excitations} + \text{number of phase encodings}$
 - $TR + \text{number of excitations}$
 - $TR \times \text{number of excitations}$
54. Which is not an MRI artifact
- Section Cross Talk Artifacts
 - Fringe Artifact
 - Beam hardening artifact
 - Truncation Artifacts

55. The spatial resolution of the computed radiography images depends on
- The laser spot size
 - thickness of the phosphor layer
 - Sampling rate of the emitted light
 - All of the above
56. True regarding direct conversion detectors
- Amorphous selenium give electric signal
 - Photo diode gives electric signal
 - Cesium iodide is used
 - Gadolinium oxy-Sulphide is used
57. Which of the following is not related to image intensifier system
- Defocusing
 - Distortion
 - Vignetting
 - Aliasing
58. Which is the most widely used DSA process
- Mask-mode subtraction
 - Time interval difference subtraction
 - Dual energy subtraction
 - Hybrid subtraction
59. Pigtail catheter can be used in all vessels except
- Main pulmonary artery
 - Aorta
 - Carotid artery
 - Inferior vena-cava
60. Stenver's view is
- AP view of skull
 - Anterior oblique view
 - For visualizing orbit
 - 45 degree cranial angulation
61. False statement regarding KUB AP view
- The centre of the image is umbilicus
 - Symphysis pubis is to be covered
 - The exposure is made on arrested expiration.
 - The centre of the image is 1 cm below iliac crest.
62. Regarding mammography units, the true statement is :
- Spatial resolution is 8–10 line pairs/mm
 - Anode is on the chest wall side
 - Focal spot size for the magnified view is 0.3 mm
 - Focus-to-film distance (FFD) is fixed in mammography

63. Technique which might increase the CT dose includes
- limiting the coverage of the scan.
 - increasing mA.
 - utilisation of body mass index chart.
 - using the 3D dose modulation
64. which of the following is not a CT contrast agent
- Iopamidol
 - Sulfur hexafluoride
 - Iohexol
 - Iodixanol
65. Which of the following is not a lower limb artery
- brachial artery
 - peroneal artery
 - tibial artery
 - popliteal artery
66. What is the unit of air kerma?
- J/Kg
 - Gy cm²
 - mSv
 - Gy cm
67. Line focus principle reduces:
- Apparent focal spot size compared to the real
 - Real focal spot size
 - The anode angle
 - The image size
68. According to electron band theory, electrons in which band is considered as free electrons ?
- Filled Band
 - Conduction band
 - Valence band
 - Forbidden band
69. Toes segment of characteristic curve indicates
- Over exposure
 - Adequate exposure
 - Under Exposure
 - No Exposure
70. What is used to read to PSP plate
- White Light
 - Heat
 - Laser Beam
 - Electrical Charge

71. If milliamperage of is increased from 100 mA to 200 mA and all other factors remain the same, the X-ray beam will have:
- Better Quality
 - Twice the penetrating ability
 - Twice the No of X-Ray photons
 - For times more energy
72. Wavelength of diagnostic X-Ray is
- $10^{-9} - 10^{-10}\text{m}$
 - $10^{-11} - 10^{-10}\text{m}$
 - $10^{-11} - 10^{-10}\text{nm}$
 - $10^{-9} - 10^{-10}\text{pm}$
73. Using a technique of 70 KVp, 100mA& 0.1sec calculate HU applied in the X-Ray tube for a single phase generator
- 10HU
 - 7HU
 - 700HU
 - 100HU
74. The main source of off-focus electron is,
- Back scatter from the cathode
 - Back scatter from the anode
 - High speed electron interact with the collimator
 - High speed electron interact with the focal track
75. Intensity of radiation proportional to
- kVp
 - kVp^2
 - $1/\text{kVp}$
 - $1/\text{kVp}^2$
76. Shoulder joint is an example for
- Saddle joint
 - Pivot joint
 - Hinge joint
 - Ball & socket joint
77. Device that can convert one form of energy into another
- Transister
 - Transducer
 - Rectifier
 - Inductor
78. Change in the perceived freequency of sound emitted by a moving source
- Oscillation
 - Deflection
 - Refraction
 - Doppler effect

79. Effective dose equivalent for Diagnostic Chest X-Ray exam
- 10mSv
 - 2mSv
 - 0.55mSv
 - 0.06mSv
80. Ratio of the incident radiation falling on the grid to the transmitted radiation passing through the grid
- Bucky factor
 - Grid ratio
 - Lines per inch
 - Contrast improvement factor
81. Moving grids was invented by
- Hans Geiger
 - Anthony Seibert
 - Paul Frame
 - Dr. Hollis E Potter
82. Assertion : Low energy techniques are used to promote photoelectric attenuation Reason : Fat & Water are difficult to differentiate radiographically
- Both assertion and reason are false
 - Both assertion and reason are true and reason is the correct explanation for assertion
 - Both assertion and reason are true and reason is not the correct explanation for assertion
 - Assertion is false & Reason is true
83. The main anatomical structure which produces CSF is called
- Cerebral cortex
 - Amygdala
 - Foramen of Monroe
 - Choroid plexus
84. T2 of Fat is _____ that of water
- Shorter
 - Longer
 - equal to
 - much greater than
85. If the patient stops breathing in the X-Ray Department
- Image the patient & call emergency
 - Begin pulmonary resuscitation
 - Notify the radiologist
 - Place the patient in sitting position
86. HSG is done on which day of 28 day cycle
- 1-4
 - 4-10
 - 14-18
 - 10-14

87. Most commonly used TLD crystal
- LiF
 - CaSO₄
 - Borate
 - BaF
88. Multifactorial disease characterized by an absolute reduction of the total bone mass
- Osteomyelitis
 - Osteoporosis
 - Osteosarcoma
 - Chondrosarcoma
89. Common malignant tumour arising from the female genital tract
- Carcinoma of the cervix
 - Fibroid uterus
 - Carcinoma endometrium
 - Ovarian tumours
90. The flexion recommended for lateral projection of knee is
- 45 degree
 - 20-30 degree
 - 35-40 degree
 - 35-40 degree
91. Specific absorption rate is a measure of power absorbed per unit
- Mass
 - Lengh
 - Volume
 - Time
92. Photoelectric effect is also known as ;
- Hertz Effect
 - Edison Effect
 - Absorption Effect
 - Augur Effect
93. Bremstrahlung is produced when
- electron bombarding the target eject electrons from the inner orbits of the target atoms
 - electron interact with the outer orbit electron
 - electron attracted towards the electron
 - electron passes near the nucleus
94. Frog's legs view is
- AP view of hip joint
 - To view neck of the femur
 - Centering at femoral artery pulsation at groin
 - 15 degree x-ray beam angulation

95. Seldinger technique
- is a medical procedure to obtain safe access to blood vessels
 - Technique used for decreasing the patient radiation dose
 - Is a method used to improve image quality in MRI
 - Is a technique used in Cardiac CT.
96. All the following is related to CT scan except
- EMI laboratory
 - Godfrey Hounsfield
 - Dr. Paul Lauterberg
 - Dr. James Ambrose
97. Electric charge of a proton numerically equal to the charge of,
- Neutron
 - Proton
 - Nucleon
 - Electron
98. K shell energy of Tungsten
- 59keV
 - 11keV
 - 70keV
 - 60keV
99. Relationship between exposure & Density is plotted as
- X-Ray tube rating chart
 - Characteristic curve
 - H & D Curve
 - Both b & c
100. Plank's constant in SI unit is
- 6.62×10^{-34}
 - 3.32×10^{-34}
 - 6.62×10^{-19}
 - 3.32×10^{-19}

Academic Session – January 2022

DAMIT Answer Key

01	A	51	A
02	C	52	B
03	C	53	A
04	C	54	C
05	A	55	D
06	C	56	A
07	C	57	D
08	B	58	A
09	A	59	C
10	A	60	B
11	C	61	A
12	B	62	D
13	C	63	B
14	B	64	B
15	C	65	A
16	A	66	A
17	D	67	A
18	B	68	B
19	A	69	C
20	B	70	C
21	C	71	A
22	C	72	B
23	C	73	C
24	B	74	B
25	D	75	B
26	B	76	D
27	D	77	B
28	D	78	D
29	B	79	D
30	B	80	A
31	B	81	D
32	D	82	B
33	C	83	D
34	B	84	A
35	A	85	B
36	B	86	B
37	C	87	A
38	C	88	B
39	A	89	A
40	C	90	B
41	B	91	A
42	B	92	D
43	B	93	D
44	A	94	C
45	C	95	A
46	A	96	C
47	B	97	D
48	A	98	C
49	A	99	D
50	A	100	A

