SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY, THIRUVANANTHAPURAM – 695011

ENTRANCE TEST: ACADEMIC SESSION 2017

DIPLOMA IN ADVANCED MEDICAL IMEGING TECHNOLOGY

Time: 90 Mts. Max. Marks: 100

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1. The Effective focal spot is determined by the target angle and the
   a. Distance from the anode to the cathode
   b. Composition of anode
   c. Diameter of anode
   d. Filament of the cathode
2. Radiation from tube housing other than the primary beam is called
   a. Remnant
   b. Secondary
   c. Compton
   d. Leakage
3. The type of rectification used in a small mobile x-ray apparatus is
   a. Full wave
   b. Half wave
   c. Self
   d. Mechanical
4. Which of the following is most likely to damage the x-ray tube
   a. Excessive vibration
   b. Poor insulation
   c. Excessive anode speed
   d. High MA values
5. The heat storage capacity of anode tube is
   a. 50,000-60,000HU
   b. 70,000-4,00,000HU
   c. 5,00,000-7,50,000HU
   d. Over 10,00,000HU
6. When pitting of the target occurs, there is a decrease in the image sharpness because
   a. Excessive heat is produced
   b. Electrons are lost in depressions
   c. The tube angle decreases
   d. The pitting creates an opposite charge

7. The size of the effective focal spot depends on the
    a. Cathode connections
    b. Angle of target
    c. Rotor motor
    d. Target material
8. The major benefit of steep angle target is
    a. Increased load capacity
    b. Greater field coverage
    c. Greater anode heel effect
    d. More uniform radiographic density
9. An excessive tube vibration causes
    a. Magnification of the image
    b. Diminished sharpness of image
    c. Fluctuation in KV
    d. Excessive density
10. In modern rotating anode tube, the target is coated with
    a. Tungsten – copper alloy
    b. Molybdenum – Magnesium alloy
    c. Tungston – rhenium alloy
    d. Pure copper to dissipate heat
11. The primary purpose of a filter in a diagnostic radiographic machine is to reduce
    a. Scatter radiation
    b. Distortion
    c. Recorded detail
    d. Skin absorption
12. The motor that drives the rotating anode is called a/an
    a. AC motor
    b. DC motor
    c. Induction motor
    d. Recoil motor
13. The focusing cup surrounds the
    a. Anode
    b. Filament
    c. Rotor
    d. Glass envelope
14. Most radiologic tube features are due to
    a. Loss of tube vacuum
    b. Burning the filament
    c. Insufficient current
    d. Damage to target
15. X-ray tube filaments are usually made of
    a. Molybdenum
    b. Tungsten
    c. Copper
    d. Chromium
    e.

16. The formula KVp times mA times exposure time is used to determine
    a. Space damage
    b. Thermionic damage
    c. Exposure rate
    d. Heat units
17. Which of the following substance has the highest effective atomic number
    a. Aluminium
    b. Calcium
    c. Molybdenum
    d. Barium
18. The radiological image is composed of mainly
    a. Primary radiation
    b. Secondary radiation
    c. Scattered radiation
    d. Remnant radiation
19. A transformer with more turns in its secondary coil than in its primary coil would be expected to
    a. Increase the voltage and decrease the amperage
    b. Increase the voltage and the amperage
    c. Decrease the voltage and increase the amperage
    d. Decrease the voltage and the amperage
20. The size of focal spot has little to do with detail when the SID is greater than
    a. 20 inches
    b. 36 inches
    c. 40 inches
    d. 72 inches
21. An electric capacitor has the function of
    a. Stabilizing voltage
    b. Regulating amperage
    c. Measuring resistance
    d. Storing an electric charge
22. Rectification is a process that changes
    a. Pulsating DC to AC
    b. AC to pulsating DC
    c. AC to DC
    d. Pulsating DC to pulsating DC
23. An autotransformer function as a
    a. Line-voltage compensator
    b. Rectifier
    c. KV selector
    d. Filament transformer
24. When nonscreen film is used the developing time is
    a. Increased by 2mts
    b. Decreased by 5mts
    c. Increased by about 50%
    d. Not changed

25. The silver halide latent image is produced by
    a. Sodium sulfite
    b. Acetic acid
    c. X-rays, light or other forms of radiation
    d. Developing agent
26. Which of the following substances does not emit light when bombarded by x-rays
    a. Zinc sulphide
    b. Calcium tungstate
    c. Barium planitocyanide
    d. Silver halide
27. High speed films and intensifying screens enable the use of
    a. Shorter FFD
    b. Lower MAS values
    c. Higher KV
    d. Less infiltration
28. Poor films screen contact results in
    a. Additional density
    b. Decreased definition
    c. Varied contrast levels
    d. Increased penumbra
29. The intensification factor refers to their
    a. Speed
    b. Resolution
    c. Lag
    d. Density
30. The condition of osteolysis would require 1) use of a large focal spot 2) a decrease on exposure factors 3) utilization of a high grade ratio
    a. 1 only
    b. 2 only
    c. 1 & 2 only
    d. 1,2 & 3
31. Which of the following projections will clearly demonstrate the lumbosacral junction
    a. PA
    b. AP with 35^0 cephald angulation
    c. Lateral
    d. Lateral decubitus
32. The slope of straight line portion on a characteristic curve is called the film's
    a. Gradient
    b. Latitude
    c. Peak
    d. Contrast

33. Which of the following is not considered an organic reducing agent
    a. Phenidone
    b. Potassium alum
    c. Hydroquinone
    d. Elon
34. The hardner in fixing solution is
    a. Acetic acid
    b. Sodium bicarbonate
    c. Chrome alum
    d. Potassium hydroxide
35. The essential ingredients of the fixer are
    a. Preservative, reduced, hardener and acid
    b. Acid, hardener, hypo and preservative
    c. Tanning agent, accelerator, reducer & preservative
    d. Alkali, preservative, reducer & restrainer
36. Which of the following carpal bones articulate with the first digit
    a. Pisiform
    b. Hamate
    c. Trapezoid
    d. Trapexium
37. Which of the following statement is incorrect
    a. Trochlea is located in the humerus
    b. Manubrium is a part of sternum
    c. Acromion is the most prominent point of shoulder
    d. The glenoid fossa is a part of humerus
38. The central ray of AP shoulder, non-trauma should be directed to the
    a. Coracoid process
    b. Glenoid fossa
    c. Acromion
    d. Acromioclavicular joint
39. Which of the following is the most superior
    a. Trochlea
    b. Olecranon process
    c. Radial notch
    d. Capitulum
40. The axial plantodorsal projection of calcaneus requires a tube angulation of
    a. 10^0
    b. 25^0
    c. 40^0
    d. 54^0
41. The greater trochanter lies at the same level as which other palpable bony land mark
    a. Symphysis pubis
    b. Coccyx
    c. Obturator foramen
    d. Anterior superior iliac spine

42. Which of the following structures is NOT shows in the inferosuperior projection of hip
    a. Inter trochantric crest
    b. Ischial tuberosity
    c. Acetabulum
    d. Ischial spine
43. A true AP projection of hip calls for a rotation of foot approximately
    a. 10^0 eversion
    b. 15^0
    c. 20^0
    d. 35^0
44. The iliac crest in at the level of
    a. 1^{st} lumbar
    b. 1^{st} & 2^{nd} sacrum
    c. D11
    d. L4
45. In a limb is encased in plaster of paris the exposure required is _____ the normal exposure
    a. Equal to
    b. Twice
    c. Thrice
    d. None of the above
46. Disadvantages of high KV technique include all of the following except
    a. Bone detail in skeletal work is poorly rendered
    b. Loss of details and poor contrast is soft tissues
    c. Risk of over penetration
    d. All of the above
47. The methods of producing subtraction films include
    a. Photographic
    b. Color
    c. Electronic
    d. All of the above
48. Use of macro radiography may include
    a. Sialography
    b. Dacryocystography
    c. Orbital phlebography
    d. In the diagnosis of pneumoconiosis
49. Uses of xero radiography include
    a. Demonstration of calcification in soft tissues
    b. Mammography
    c. Evaluation of extremity prosthesis
    d. All of the above

50. Which of the following projections would best demonstrate the cervical intervertebral foramina
    a. PA oblique axial
    b. Open month
    c. Lateral
    d. Extension
51. The common screen speed are
    a. High resolution screen – slow speed
    b. Regular or standard screen – medium speed
    c. Fast screen – past speed
    d. All of the above
52. The following are advantages of miniature radiography except
    a. Huge saving in valuable storage space
    b. Versatility
    c. Cheap storage envelope
    d. No need for any film reader
53. Deviation from normal development conditions of processor are revealed by checking important parameters except
    a. Speed
    b. Contrast
    c. Density of base fog
    d. Ideal film density of 2-4
54. Regarding safe light the following are true except
    a. 25W lamp
    b. Minimum of 1.2 meters from film
    c. Intensity increases due to inverse square law
    d. b & c are wrong
55. In reverse towne's position, the central ray enters the skull 1.5 in below the
    a. Mental point
    b. External auditory meatus
    c. External occipital protuberance
    d. Glabella
56. The crista galli is well demonstrated in which of the following cranial projections
    a. PA
    b. AP axial
    c. Lateral
    d. Full basal
57. The best projection for facial bone on an injured person who should not be turned prone is
    a. AP
    b. Rhese
    c. Water's
    d. AP axial

58. The Haas view will clearly demonstrate the 1)dorsum sella 2) foramen ovale 3) petrous pyramids
    a. 1 & 2 only
    b. 1 & 3 only
    c. 2 & 3 only
    d. 1, 2 & 3
59. Which of the following is part of mandible 1) mental foramen 2)Styloid process 3) coronoid process
    a. 1 & 2
    b. 1 & 3
    c. 3 & 4
    d. 1, 2 & 3
60. The normal L5-1 junction forms an angle of
    a. $20 - 25^0$
    b. $30\text{-}35^0$
    c. $40\text{-}45^0$
    d. $60\text{-}80^0$
61. To demonstrate pleural effusion in the chest of a patient who is unable to be put in an exact position, which of the following positions might be of use
    a. Transthoracic
    b. Supine
    c. Lateral decubitus
    d. Trendelenburg
62. Which of the following is well demonstrated in lateral chest projection
    a. Trachea
    b. Interlobar fissures
    c. Primary and secondary bronchi
    d. Mediastinum
63. For lateral projection of sternum, the central ray is directed
    a. 6 cm superior from ensiform process
    b. 4cm superior from suprasternal notch
    c. 2cm inferior from manubrium sterni
    d. 2cm inferior from sternal angle
64. The RPO position of radiography of the ribs will demonstrate an injury along the
    a. Left margin
    b. Costal cartilage
    c. Right margin
    d. Facet
65. Which of the following structures could not be demonstrated on a lateral skull radiograph
    a. Anterior clinoid process
    b. Calcified pineal gland
    c. Lambdoid
    d. Occipital condyle

66. Which of the bone contain a paranasal sinus
    a. Parietal
    b. Sphenoid
    c. Occipital
    d. Temporal
    e. All of the above
67. Which of the following view will demonstrate the petrous pyramids, dorsum sella and posterior clinoid process
    a. Caldwell
    b. AP axial
    c. Waters
    d. Schuller
68. An excellent view to demonstrate facial bone is
    a. Stenver's view
    b. Waters
    c. Rhese
    d. Mayer's
69. Which of the statement is incorrect
    a. Caldwell projection demonstrate antereior ethmoid cells
    b. PA demonstrates crista galli
    c. Stenosis projection demonstrates optic foramen
    d. Sub basal projection demonstrates jugular foramen
70. During a radiographers pregnancy, her exposure should not exceed
    a. 300 mrcm
    b. 500mr cm
    c. 1000mr cm
    d. 5000mr cm
71. Which of the following is an intermediate or early radiation effect on humans
    a. Local tissue damage
    b. Haematologic syndrome
    c. Life span shortening
    d. Leukaemia
72. Which of the following is considered a late or delayed radiation effect on humans
    a. Cryogenetic damage
    b. Leukaemia
    c. Local tissue damage
    d. Hematologic depression
73. How much equivalent Al filtration does the glass window in most x-ray tubes provide
    a. 1.25mmAl
    b. 1.5mm Al
    c. 1mm Al
    d. 1.5mm Al

74. Which of the following cell types is high in radiosensitivity
    a. Chondrocytes
    b. Erythroblasts
    c. Spermatids
    d. Osteoblasts
75. Which of the following does not relate to attenuation of the beam
    a. Absorption
    b. Anode materials
    c. Inverse-square law
    d. Scattering
76. The term Ortho voltage is used to denote a range of kilovoltage from
    a. 130-150 KV
    b. 200-200 KV
    c. 350-500 KV
    d. 500-1000KV
77. The dose equivalent of gamma and x-radiation is calculated by using the formula
    a. rads x 1 =rcm
    b. rads x 5 = rcm
    c. rads x 10 = rcm
    d. rads x 20 = rcm
78. Right anterior oblique radiographs of stomach filled with barium and high voltage technique will show
    a. Duodenal bulb
    b. Distal esophagus
    c. Greater curvature
    d. Upper stomach
79. Fundus of stomach is well filled with barium on recumbent position when patient position is
    a. RAO
    b. LPO
    c. Left lateral
    d. AP
80. MR contrast media acts by
    a. Attenuation of signals
    b. Shortens T1 relaxation time
    c. Prolongs T1 relaxation time
    d. Shortens T2 relaxation time
81. Signal appears bright in blood vessels due to
    a. Rapid flow
    b. Slow flow
    c. T2 shortening of blood
    d. Due to Gadolinium contrast

82. MR contrast media is not safe in
    a. Pregnancy
    b. Renal failure
    c. All of the above
    d. GFR >60
83. Regarding K-space all are true except
    a. Mathematical data space
    b. Uses a 2D FT
    c. Central lines decide contrast
    d. Central lines decide spatial resolution
84. Phase contrast study is a
    a. Slow
    b. Uses contrast
    c. Artifacts less
    d. No additional gradient
85. Image acquisition time is directly related to
    a. Matrix size
    b. NEX
    c. Repetition time
    d. Signal to noise ratio
86. Regarding MR arthrography following is true except
    a. Done without contrast
    b. Undilated contrast used
    c. 1: 100 dilution used
    d. Not useful in trauma
87. The strength of gradient is expressed by all except
    a. Maximum gradient strength
    b. Rise time
    c. Slow rate
    d. Eddy currents
88. Double contrast study of barium meal involves the use of
    a. Barium sulphate suspension of food coating quality
    b. Gas producing agent
    c. A drug causing gastric atony
    d. All of the above
89. The following are true regarding slip ring technology
    a. Abolishes the need for cable between generator and cathode
    b. There are two rings
    c. No backward and forward rotation
    d. Brushes transmit power from stationary ring to anode
90. All are true regarding of spiral CT except
    a. Large volume of contrast medial required
    b. Very precise timing of enhancement required
    c. Improved 3D images
    d. Reduced MAS

91. The electron gun CT has followed except
    a. Electrons hit a large stationary anode
    b. There is a focus coil and defection coil
    c. There is dector ring and target rings
    d. The extend of circumference anode used is 360^0

92. The following are true regarding bone density measurements except
    a. Single photon absorptiometry used
    b. QCT can be used
    c. Dual photon absorptiometry (DPA) used to measure BMD
    d. DPA has short scanning time
93. Indication for bone mineral density measurements include all except
    a. Osteoporosis
    b. Hyper parathyroidism
    c. Corticosteroid therapy
    d. Routine bone mineral survey in population
94. Regarding cardiac imaging following are true except
    a. SPECT can be used
    b. Thallium 201 used
    c. Right ventricular pressure measurement can be done by nuclear study
    d. Phase contrast study used in SPECT
95. What is the % of radioopaque gallstones
    a. 2 %
    b. 6%
    c. 10%
    d. 25%
96. Which matching is not correct
    a. biligraffin – gallstones
    b. lipidiol – AVM embolisation
    c. Barium sulphate – GI tract
    d. myodil – Bronchography
97. For investigation of free gas under diaphragm in a ill patient the following is used
    a. Left lateral decubitus
    b. Supine antero-posterior
    c. Erect antero-poaterior
    d. None of the above
98. Peripheral venography is carried out
    a. To determine the patency of deep veins
    b. To determine the patency of valves
    c. In case of deep vein thrombosis
    d. All of the above

99. All of the following views can be used both for mastoid and internal auditory canals except
    a. Lateral oblique
    b. Fronto-occipital
    c. Submento vertical
    d. None of the above

100. Small tumors could be missed on a CT scan because of
    a.Large section thickness
    b.Incorrect window settings
    c.Large table index
    d.All of the **above**