

# Sikkim Public Service Commission

Main Written Examination for the post of  
Radiographer/CT Scan Radiographer Technician

## Paper II

Time Allowed : 3 Hrs.

Maximum Marks : 100

### INSTRUCTIONS TO CANDIDATES

*Read the following instructions carefully before answering the questions :-*

1. **IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.**
2. Please note that it is the candidate's responsibility to fill in the Roll Number carefully and without any omission or discrepancy at the appropriate places in the **OMR ANSWER SHEET** for MCQ. Any omission/discrepancy will render the Answer Sheet liable for rejection.
3. **Use only Black Ball Point Pen to fill the OMR sheet**
4. Do not write anything else on the OMR Answer Sheet except the required information.
5. **This booklet contains MCQ and conventional type of questions divided into 3 sections. Section A contains MCQ and Section B and C contains conventional type of questions.**
6. Before you proceed to mark in the Answer Sheet (OMR), you have to fill in some particulars in the Answer Sheet (OMR) as per given instructions.
7. After you have completed filling in all your responses on the OMR Sheet & writing section in a separate Answer Sheet, you should hand over the Answer Sheet & OMR Sheet to the Invigilator only. You are permitted to take away with you the Test Booklet.
8. **Marking Scheme**  
*THERE WILL BE NEGATIVE MARKING FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS.*
  - (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to that question will be deducted as penalty.
  - (ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to the question.
  - (iii) If a question is left blank. i.e., no answer is given by the candidate, there will be no penalty for that question.

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO**

Section A  
Multiple Choice Questions

(50x1=50)

- 1) Which of the following does not improve the heat capacity of an X ray tube
  - A) Rotating anode
  - B) Thermionic emission
  - C) Large Focal Spot
  - D) Small Target Angle
  
- 2) Methods of Heat dissipation in X ray tubes is
  - A) Conduction
  - B) Convection
  - C) Radiation
  - D) All of above
  
- 3) Changing the x ray tube current (mA) most likely to modify the x ray beam
  - A) Maximum Energy
  - B) Quantity
  - C) Quality
  - D) Patient penetration (%)
  
- 4) The typical current in x ray tube filament is
  - A) 4 mA
  - B) 40 mA
  - C) 8 A
  - D) 4 A
  
- 5) High ratio grids increase all the following except
  - A) Required mAs
  - B) Image Contrast
  - C) Screen Film speed
  - D) Patient dose
  
- 6) The Image intensifier input phosphor is made of
  - A) NaI
  - B) ZnCdS
  - C) CsI
  - D) Pbl



- 7) Timer is device which is responsible to
- A) Time the Exposure
  - B) Terminate the exposure
  - C) Initiate the exposure
  - D) All of above
- 8) The function of beam collimator is
- A) To regulate the shape and size of beam
  - B) To decrease the patient dose
  - C) To improve the quality of radiograph
  - D) All of above
- 9) The preferred grid ratio to be used in radiography is
- A) 10 : 1
  - B) 8 : 1
  - C) 5 : 1
  - D) 21 : 1
- 10) Cinefluorography is the process of making record of
- A) Images on cine film
  - B) Images on fluoroscopic screen
  - C) Images on TV monitor
  - D) Images on cassettes
- 11) Diode tube have
- A) Single electrode
  - B) Double electrode
  - C) Triple electrode
  - D) All of above
- 12) The Biliary or excretory system for liver consist of bile duct and
- A) Urinary bladder
  - B) Gall Bladder
  - C) Pancreas
  - D) Spleen
- 13) The recto Sigmoid area is well demonstrated in
- A) lateral Decubitus position
  - B) Chassard – lapine position
  - C) Double contrast barium Enema
  - D) Post evacuation Film

- 14) The strength of Barium sulphate mixture used for barium Meal examination should be
- A) 150% to 160% w/v
  - B) 90% to 110% w/v
  - C) 20% to 30% w/v
  - D) 50% to 60% w/v
- 15) All pelvic or lower abdomen examination of Ultrasound should be conducted in
- A) Full Stomach
  - B) Empty stomach
  - C) Empty Urinary Bladder
  - D) Distended Urinary Bladder
- 16) The Lumber puncture site for introduction of contrast is
- A) Between 4th & 5th lumber vertebra
  - B) Between 2nd & 3rd lumber vertebra
  - C) Between 3rd & 4th lumber vertebra
  - D) any one
- 17) Regarding radiographic PA view of the thorax:
- A) Shoulders are rotated posteriorly.
  - B) Deep inspiration increases radiolucency of lungs.
  - C) All thoracic vertebrae are clearly visible
  - D) Central tendon of diaphragm is best recognized
- 18) A pregnant women radiation worker can work in special radiological procedure
- A) Can work but abdomen/pelvis dose should not exceeds 2mSv
  - B) Should not work in radiation
  - C) Can work but abdomen/pelvis dose should not exceeds 20mSv
  - D) Should work and receive 20mSv dose
- 19) A densitometer is
- A) A meter used to measure X-ray intensity
  - B) An instrument for measuring film density
  - C) A meter used to measure the density of a material
  - D) A meter used to measure tube current



- 20) The flow rate in barium enema can be controlled by
- A) Degree of elevation of beg
  - B) Releasing pressure cuff
  - C) Gentle manual pressure
  - D) Any one of A,B and C
- 21) The gray and white matter can be clearly distinguished in one of the following
- A) Cerebral Angiography
  - B) Ventriculography
  - C) CT Scan Brain
  - D) Tomography
- 22) The presence of stone in ureter may cause
- A) Renal Carcinoma
  - B) Hydronephrosis
  - C) Enlarge prostate
  - D) Supra renal tumor
- 23) For examining children with Tracheoesophageal (TEF) fistula it is preferred to use
- A) Use Barium sulphate contrast agent
  - B) Use Aqueous low-osmolality contrast agent
  - C) Use any of above contrast agent
  - D) None of these
- 24) Flouroscope was invented by
- A) W.C. Roentgen
  - B) H E Johens
  - C) Thomas Edison
  - D) Hounsfield
- 25) During Radiography bony fracture which contains a large crack, will appear on the radiograph as
- A) A dark, intermittent or continuous line
  - B) A light, irregular line
  - C) Either a dark or light line
  - D) A fogged area on the radiograph

- 26) Adrenaline is used in radio diagnosis to raise
- A) Blood Pressure
  - B) Bowel contractions
  - C) Muscle contraction
  - D) None of these
- 27) During manual film processing, the purpose of the stop bath is to
- A) Change the exposed silver salts to black metallic silver
  - B) Eliminate most water spot and streaks
  - C) Neutralize the developer and stop the developing process
  - D) None of the above
- 28) Which is not a vital sign
- A) Blood Pressure
  - B) ECG
  - C) Temperature
  - D) Pulse Rate
- 29) While performing radiograph of a patient thin body part should be kept towards
- A) Anode
  - B) Cathode
  - C) Focusing Cup
  - D) Both B & C
- 30) The following substance are not allowed in MRI gantry room during MRI Scan
- A) Ferromagnetic substance
  - B) Para magnetic substance
  - C) Diamagnetic substance
  - D) Both A & B
- 31) A wire mesh is used to test
- A) Focal Spot Size
  - B) For Screen Lag
  - C) Film-Screen Contact
  - D) Screen Speed
- 32) Diazepam is a drug used for
- A) Increasing BP
  - B) Decreasing BP
  - C) Control Heart rate
  - D) Sedation



- 33) The use of ..... during radiography of KUB increases patient dose
- A) Grid
  - B) Intensifying screen
  - C) CR system
  - D) all of above
- 34) Optimum patient care includes all the following except
- A) Loyalty to the hospital
  - B) Providing economic and timely service
  - C) Preventing spread of disease
  - D) Radiation safety
- 35) When lifting the heavy patient for radiography, the weight
- A) Should be held at 10inches from the center of gravity
  - B) Should be distributed equally from the gravity line
  - C) Should be held as close to body as possible
  - D) Should be held at the right of the center of gravity
- 36) The preferred contrast media used for Barium Meal Follow Through in case of complete bowel loop obstruction
- A) Gadolinium
  - B) Barium sulphate
  - C) Gastrografin
  - D) Ultravist
- 37) All of the following affect patient dose, except
- A) Inherent Filtration
  - B) Added Filtration
  - C) Focal Spot Size
  - D) Source-Image Distance
- 38) During the planning of the radiology department patient waiting area should be at
- A) Entrance of department
  - B) End of the department
  - C) Middle of the department
  - D) Anywhere in the department

39) Increasing the transducer thickness is most likely to increase the sound

- A) Frequency
- B) Velocity
- C) Wavelength
- D) Intensity

40) Which is least likely an ultrasound display mode

- A) A
- B) B
- C) T
- D) T-M

41) The background colour in radiation protection symbol is

- A) Red
- B) White
- C) Yellow
- D) Blue

42) The Breathing rate in humans is

- A) 14 to 16 per minute
- B) 10 to 12 per minutes
- C) 72 to 80 per minute
- D) 20 to 24 per minute

43) Which of the following has the highest acoustic impedance

- A) Bone
- B) Fat
- C) Air
- D) Water

44) Blackness in processed X-Ray film is due to

- A) Silver metal
- B) Hydroquinone
- C) Silver bromide
- D) None of above



- 45) The plane that passes vertically through the body dividing it into anterior and posterior halves is termed the
- A) Midsagittal Plane
  - B) Midcoronal Plane
  - C) Sagittal Plane
  - D) Transverse Plane
- 46) The lower portion of the costal margin is approximately at the same level as the
- A) Mid-Thorax
  - B) Umbilicus
  - C) Xiphoid Tip
  - D) Third Lumbar Vertebra
- 47) With the patient recumbent and head positioned at a lower level than the feet, the patient is said to be in the
- A) Trendelen Burg Position
  - B) Fowler Position
  - C) Decubitus Position
  - D) Sims Position
- 48) Which of the following likely has the longest T2 relaxation time
- A) Fat
  - B) Liver
  - C) Kidney
  - D) CSF
- 49) The largest susceptibility artifacts are likely to be seen between tissue and
- A) Air
  - B) Blood
  - C) Fat
  - D) Bone
- 50) Which of the following is most likely to suppress signals from fat
- A) FLASH
  - B) BOLD
  - C) STIR
  - D) FLAIR

## SECTION B

Short Answer Type Questions (Attempt Any FOUR)

(5x4=20)

- 1) Briefly describe about anatomy of Digestive system
- 2) Explain about preparation of Barium contrast for various radiological Examination
- 3) Describe about maintenance of X ray cassettes.
- 4) What are the Transducers? State its types.
- 5) How you prepare the patient for Radiographic Examination.
- 6) Briefly describe about Different type of MRI coils

## SECTION C

Long Answer Type Questions (Attempt Any TWO)

(15x2=30)

- 7) Describe about various radiography views of Chest.
- 8) Draw a schematic diagram of X-ray imaging system. Describe its various components
- 9) Describe about basic principal of CT Scanning. Explain about patient preparation and positioning in various CT examinations.
- 10) Explain about conventional & digital image processing in radiography.