रेलवे भर्ती बोर्ड / RAILWAY RECRUITMENT BOARD

सी ई एन नं. - 04/2024 - CEN No. - 04/2024

Test Date	30/04/2025
Test Time	9:00 AM - 10:30 AM
Subject	RADIOGRAPHER X RAY TECHNICIAN

*** Note**
Correct Answer will carry 1 mark per Question.
Incorrect Answer will carry 1/3 Negative mark per Question.

1. Options shown in green color with a tick icon are correct.
2. Chosen option on the right of the question indicates the option selected by the candidate.

Section : **General Ability**

Q.1 **Which of the following substances will not be broken down by the action of bacteria?**

Ans
- ✗ 1. Cotton
- ✗ 2. Newspapers
- ✗ 3. Fruits
- ✓ 4. Plastics

Q.2 **Which of the following is NOT correctly matched between diseases and the nature of infective agents?**

Ans
- ✗ 1. Gonorrhoea - Bacterial infection
- ✓ 2. AIDS - Bacterial infection
- ✗ 3. Warts - Virus infection
- ✗ 4. Syphilis - Bacterial infection

Q.3 **Town E is to the west of town B. Town C is to the east of town B. Town A is to the north of town B. Town F is to the north of town C. Town A is to the west of town F. What is the position of town F with respect to town E?**

Ans
- ✗ 1. North-west
- ✗ 2. South-west
- ✓ 3. North-east
- ✗ 4. South

Q.4 **Find the number of bricks, each measuring 21 cm × 48 cm × 20 cm, required to construct a wall 56 m long, 14 m high and 0.4 m thick, while the sand and cement mixture occupies 10% of the total volume of wall.**

Ans
- ✗ 1. 14300
- ✓ 2. 14000
- ✗ 3. 14100
- ✗ 4. 13900

Q.5 **For a spherical mirror with _____ aperture, the principal focus lies midway between the pole and the centre of curvature.**

Ans
- ✓ 1. a small
- ✗ 2. a large
- ✗ 3. any
- ✗ 4. infinite

Q.6 **Regarding the relationship between the Fundamental Rights (FR) and the Directive Principles of State Policy (DPSP) in India, which of the following assertions is true?**

Ans

✔ 1. Both serve as independent pillars; however, FR are legally enforceable while DPSP cannot be.

✘ 2. DPSP are justiciable and can override FR when necessary.

✘ 3. DPSP can be enforced directly in the courts, similar to FR.

✘ 4. FR are subordinate to DPSP in case of any conflict.

Q.7 **Which of the following provisions regarding reservation in Panchayati Raj Institutions in India is mandated by the 73rd Constitutional Amendment Act?**

Ans

✘ 1. At least 50% of the seats are reserved for Scheduled Castes.

✘ 2. At least 50% of the seats are reserved for economically weaker sections.

✘ 3. No seats are to be reserved for any category.

✔ 4. Not less than one-third of the total seats for direct election must be reserved for women.

Q.8 **What role do gases used in and discharged from refrigerators and air conditioners play in air pollution?**

Ans

✔ 1. They are responsible for the depletion of the ozone layer.

✘ 2. They increase the levels of oxygen in the atmosphere.

✘ 3. They contribute to smog formation in urban areas.

✘ 4. They help in the natural cooling of the Earth's surface.

Q.9 **Which of the following compounds does NOT belong to the same homologous series as the others?**

Ans

✘ 1. Ethanol (C_2H_5OH)

✔ 2. Ethanoic acid (CH_3COOH)

✘ 3. Methanol (CH_3OH)

✘ 4. Propanol (C_3H_7OH)

Q.10 **Who among the following chaired the State Reorganisation Commission after India's independence in the early 1950s?**

Ans

✘ 1. Dr. BR Ambedkar

✘ 2. Jawaharlal Nehru

✔ 3. Saiyid Fazl Ali

✘ 4. Sardar Patel

Q.11 **What should come in place of the question mark (?) in the given series based on the English alphabetical order?**

YFO BJR ENU HRX ?

Ans

✘ 1. LUB

✘ 2. LVC

✔ 3. KVA

✘ 4. MTZ

Q.12 **Which of the following organisms break down biodegradable substances?**

Ans

✘ 1. Fungi and Green plant

✔ 2. Bacteria and Fungi

✘ 3. Bacteria and Green plant

✘ 4. Chordates and Green plant

Q.13 Which flagship programme has been specifically designed to reduce rural poverty and guarantee wage employment in India?

Ans

✗ 1. Skill India

✗ 2. Make in India

✗ 3. Startup India

✓ 4. MGNREGA

Q.14 In the Delhi Legislative Assembly election held on 5 February 2025, which party emerged victorious?

Ans

✗ 1. Indian National Congress

✗ 2. Aam Aadmi Party

✓ 3. Bharatiya Janata Party

✗ 4. Bahujan Samaj Party

Q.15 The Sun is visible _____ before actual sunrise due to atmospheric refraction.

Ans

✗ 1. 1 minute

✗ 2. 4 minutes

✓ 3. 2 minutes

✗ 4. 3 minutes

Q.16 The Brihadeshwara temple, built by the Cholas, is located in which city?

Ans

✓ 1. Thanjavur

✗ 2. Madurai

✗ 3. Kanchipuram

✗ 4. Puri

Q.17 Which Indian cricketer was nominated for the Laureus Comeback of the Year Award in February 2025?

Ans

✗ 1. Ravindra Jadeja

✗ 2. Virat Kohli

✗ 3. Jasprit Bumrah

✓ 4. Rishabh Pant

Q.18 5 bags and 18 pens together cost ₹1710, whereas 4 bags and 13 pens together cost ₹1256. The cost of 12 bags exceeds the cost of 6 pens by:

Ans

✗ 1. ₹164

✗ 2. ₹173

✓ 3. ₹168

✗ 4. ₹169

Q.19 Where was the 4^{th} edition of the India-Malaysia joint military exercise Harimau Shakti held in 2024?

Ans

✗ 1. Port Blair, India

✓ 2. Bentong Camp, Pahang district, Malaysia

✗ 3. Mizoram, India

✗ 4. Kuala Lumpur, Malaysia

Q.20 What is the maximum value that must be assigned to A so that the 8-digit number 866A2316 is divisible by 4?

Ans

✗ 1. 4

✗ 2. 7

✗ 3. 8

✓ 4. 9

Q.21 Seven boxes A, B, E, F, G, N and O are kept one over the other but not necessarily in the same order. Only B is kept above A. Only E is kept between A and F. Only G is kept below O. How many boxes are kept between N and G?

Ans

✗ 1. Two

✗ 2. Three

✗ 3. Four

✓ 4. One

Q.22 What is the approximate current when a potential difference of 0.5 V is applied across a nichrome wire having length 1 m and cross-sectional area 2 mm^2? (Consider the resistivity of nichrome wire as $1 \times 10^{-6} \Omega$ m.)

Ans

✓ 1. 1 A

✗ 2. 20 A

✗ 3. 2 A

✗ 4. 10 A

Q.23 A can lay railway track between two given stations in 14 days and B can do the same job in 28 days. With the help of C, they did the job in 4 days only. Then, C alone can do the job in:

Ans

✗ 1. 9 days

✓ 2. 7 days

✗ 3. 10 days

✗ 4. 8 days

Q.24 Identify the correct statements regarding mixtures and compounds.
1. The components of a mixture retain their individual properties, whereas the components of a compound do not.
2. A compound has a fixed composition, but a mixture can have variable proportions of its components.
3. Mixtures can only be separated by chemical methods, while compounds can be separated by physical methods.

Ans

✗ 1. All three statements 1, 2 and 3 are correct

✗ 2. Only 2 and 3 are correct

✓ 3. Only 1 and 2 are correct

✗ 4. Only 1 and 3 are correct

Q.25 Which of the following properties of Plaster of Paris makes it useful for making molds and casts?

Ans

✗ 1. It expands on setting.

✓ 2. It hardens when mixed with water.

✗ 3. It remains soft after drying.

✗ 4. It reacts with acids to form carbon dioxide.

Q.26 What will come in the place of the question mark '(?)' in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

112 × 2 ÷ 4 − 12 + 13 = ?

Ans

✓ 1. 223

✗ 2. 241

✗ 3. 112

✗ 4. 250

Q.27 **Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?**

SOW21, XTB37, CYG53, HDL69, ?

Ans

✗ 1. NIQ85

✗ 2. MIO85

✗ 3. MKQ85

✓ 4. MIQ85

Q.28 **Between which two ranges does the rift valley of the Narmada River lie?**

Ans

✗ 1. Aravalli and Nilgiri

✗ 2. Pir Panjal and Mahabharata

✓ 3. Vindhyas and Satpuras

✗ 4. Western Ghats and Eastern Ghats

Q.29 **A manufacturer sells a product to a wholesaler at a profit of 25%. The wholesaler, in turn, sells it to a retailer at a profit of 28%, and the retailer sells it to a customer at a profit of 25%. If the customer pays ₹122, find the cost price (in ₹) for the manufacturer.**

Ans

✗ 1. 60

✗ 2. 59

✓ 3. 61

✗ 4. 64

Q.30 **Which of the following movements takes place without thinking about it?**

Ans

✗ 1. Children playing

✗ 2. Buffaloes chewing cud

✓ 3. Pulling hand back from the flame

✗ 4. Cat running

Section : **Professional Ability**

Q.1 **What limits the duration of continuous fluoroscopy when initiating exposure of an x ray tube from a cold state?**

Ans

✓ 1. The anode's heat storage capacity

✗ 2. The energy of scattered radiation

✗ 3. The voltage of the ceramic insulators

✗ 4. The size of the focal spot

Q.2 **According to radiation protection guidelines for KUB radiography, when is gonad shielding not applied for females?**

Ans

✓ 1. When the entire renal tract including the bladder must be visualised

✗ 2. When no stones are suspected

✗ 3. When imaging is done in a supine position

✗ 4. When using digital radiography

Q.3 **What is the "heel effect" in x-ray production?**

Ans

✗ 1. Increase in x-ray intensity at the edges of the beam

✗ 2. Variation in beam energy due to patient thickness

✓ 3. Variation in x-ray beam intensity based on emission angle from the focal spot

✗ 4. Reduction in scatter radiation through collimation

Q.4 What is the primary purpose of a circuit breaker in an X-ray machine?

Ans

✗ 1. To enhance image resolution during exposure

✗ 2. To reduce patient radiation dose

✓ 3. To protect the equipment and operator from electrical overload or faults

✗ 4. To regulate the exposure time

Q.5 What type of X-ray tube movement is most commonly used in cranial radiography to reduce image blur?

Ans

✓ 1. Linear tomography

✗ 2. Stationary X-ray exposure

✗ 3. Spiral CT scanning

✗ 4. Fixed anode rotation

Q.6 Why is copper always used in combination with aluminium in compound x-ray filters?

Ans

✗ 1. Copper does not provide effective filtration

✗ 2. Aluminum alone cannot attenuate x rays

✗ 3. Copper is too expensive to use alone

✓ 4. To reduce filter thickness and absorb copper's characteristic radiation

Q.7 What is the main role of the International Commission on Radiological Protection (ICRP)?

Ans

✓ 1. To provide recommendations for radiation protection and dose limits

✗ 2. To enforce international radiation safety laws

✗ 3. To manufacture radiation protection equipment

✗ 4. To conduct radiological medical procedures

Q.8 What is a key advantage of using a cylinder instead of a cone for x-ray beam restriction?

Ans

✗ 1. Cylinders are less expensive to manufacture

✗ 2. Cylinders allow for a wider range of field sizes

✗ 3. Cylinders are easier to attach to the x-ray tube

✓ 4. Beam restriction occurs at the far end, reducing penumbra

Q.9 What is the most important factor in the production of scatter radiation in radiology?

Ans

✗ 1. Exposure time

✗ 2. Film speed

✗ 3. X-ray tube voltage

✓ 4. Field size

Q.10 What is the primary purpose of the X-ray beam alignment test?

Ans

✓ 1. To verify that the X-ray beam is aligned perpendicular to the image receptor

✗ 2. To measure exposure time

✗ 3. To confirm the uniformity of the image receptor

✗ 4. To check the kilovoltage peak (kVp) accuracy

Q.11 What is the term for the amount of electromagnetic radiation absorbed per unit mass in a patient during an x-ray procedure?

Ans

✗ 1. Scatter dose

✗ 2. Effective dose

✓ 3. Absorbed dose

✗ 4. Equivalent dose

Q.12 What is the primary purpose of rinsing an x-ray film after development?

Ans

✗ 1. To cool the film rapidly

✓ 2. To remove excess developer and prevent neutralization of fixer

✗ 3. To dry the film before fixing

✗ 4. To remove unexposed silver halide

Q.13 Which component of the CT control console is primarily used to adjust image contrast?

Ans

✗ 1. Input keyboard

✓ 2. Window width (WW) control

✗ 3. Image touch interface

✗ 4. Data storage drive

Q.14 Why is communication with accident and emergency (A&E) staff important before beginning a radiographic examination?

Ans

✗ 1. To reduce the number of radiographs needed

✗ 2. To determine the patient's insurance details

✗ 3. To confirm the hospital's imaging policy

✓ 4. To understand the patient's condition and ability to cooperate

Q.15 Which of the following components is part of the x-ray tube cathode and helps direct the electron beam toward the anode?

Ans

✗ 1. Collimator

✓ 2. Focusing cup

✗ 3. Target

✗ 4. Glass envelope

Q.16 In which MRI sequence is magnetic susceptibility artifact most prominently observed?

Ans

✗ 1. Inversion recovery

✓ 2. Gradient echo

✗ 3. Fast spin echo

✗ 4. Spin echo

Q.17 Which anatomical structures should be clearly visible in a correctly positioned axial calcaneum radiograph?

Ans

✗ 1. Navicular and cuboid bones

✓ 2. Subtalar joint and sustentaculum tali

✗ 3. Tibial plafond and talar dome

✗ 4. First and second metatarsals

Q.18 Why are both open and closed mouth TMJ projections commonly taken?

Ans

✗ 1. To compare symmetry of the zygomatic arches

✗ 2. To view nasal bone displacement

✓ 3. To evaluate the anterior gliding movement of the mandibular condyle

✗ 4. To assess for sinus involvement

Q.19 What is the primary purpose of a film hanger in radiography?

Ans

✗ 1. To scan the film for digital conversion

✗ 2. To expose the X-ray film to radiation

✗ 3. To store the X-ray films after development

✓ 4. To securely hold X-ray films during the manual processing

Q.20 **Which of the following is a recommended body mechanic principle for radiologic technologists?**

Ans

✗ 1. Keep feet together while lifting heavy equipment

✗ 2. Twist the spine to turn while holding a patient

✗ 3. Bend at the waist when lifting objects

✓ 4. Keep the load close to the body and lift with the legs

Q.21 **What is the tolerance limit for tube leakage radiation during QA as per standard safety guidelines?**

Ans

✗ 1. 10 mR/hr

✓ 2. 100 mR/hr

✗ 3. 150 mR/hr

✗ 4. 50 mR/hr

Q.22 **What is the primary purpose of DICOM in medical imaging?**

Ans

✓ 1. To standardize the format and communication of medical images

✗ 2. To control the radiation dose used during imaging

✗ 3. To compress images for storage

✗ 4. To store x-ray films chemically

Q.23 **Which plane divides the body into superior and inferior parts?**

Ans

✗ 1. Coronal plane

✗ 2. Median sagittal plane

✓ 3. Transverse (axial) plane

✗ 4. Parasagittal plane

Q.24 **What is the main purpose of using effervescent powder during a double contrast barium swallow?**

Ans

✗ 1. To thicken the barium

✓ 2. To create gas for esophageal distension

✗ 3. To reduce barium viscosity

✗ 4. To neutralize the barium

Q.25 **What is the monthly equivalent dose (EqD) limit recommended by the NCRP for the embryo-fetus after a pregnancy is declared?**

Ans

✗ 1. 1.0 mSv

✓ 2. 0.5 mSv

✗ 3. 10.0 mSv

✗ 4. 5.0 mSv

Q.26 **Why is the Half Value Layer (HVL) used in fluoroscopy x-ray systems?**

Ans

✗ 1. Grid alignment

✓ 2. Beam penetration and total filtration

✗ 3. Collimation accuracy

✗ 4. Image contrast

Q.27 **What is the patient position in Water's view for maxillary sinuses?**

Ans

✗ 1. Side of the face touching the image receptor

✓ 2. Chin touching the image receptor with the orbitomeatal line at 45° to the receptor

✗ 3. Chin and nose touching the image receptor

✗ 4. Forehead and nose touching the image receptor

Q.28 **Which of the following statements about CTPA (CT Pulmonary Angiography) is INCORRECT?**

Ans

✔ 1. It delivers a low radiation dose compared to other imaging modalities

✘ 2. It is a minimally invasive imaging technique

✘ 3. It is highly specific for diagnosing pulmonary embolism

✘ 4. It offers high sensitivity for detecting pulmonary embolism

Q.29 **What is the primary purpose of intelligent collimation during mobile C-arm imaging in theatre?**

Ans

✘ 1. To speed up the surgery

✔ 2. To reduce scatter and improve image quality

✘ 3. To eliminate the need for contrast agents

✘ 4. To increase image brightness

Q.30 **Which feature in mobile X-ray units enhances radiation safety for the operator?**

Ans

✘ 1. Manual exposure control

✔ 2. Long exposure cord or remote control

✘ 3. Fixed exposure settings

✘ 4. Built-in shielding for the patient

Q.31 **What is the main purpose of using lead rubber aprons and shields during radiographic examinations?**

Ans

✔ 1. To reduce radiation dose

✘ 2. To increase exposure time

✘ 3. To enhance digital image contrast

✘ 4. To support patient posture

Q.32 **What is a common limitation of mobile X-ray units compared to fixed radiographic systems?**

Ans

✔ 1. Limited tube current and power output

✘ 2. Built-in PACS integration

✘ 3. Greater maneuverability

✘ 4. Higher image resolution

Q.33 **Why is obtaining consent important before performing a radiological procedure?**

Ans

✔ 1. It ensures patient autonomy and legal protection

✘ 2. It allows the technologist to avoid documentation

✘ 3. It is optional for non-invasive procedures

✘ 4. It speeds up the examination process

Q.34 **What is the primary advantage of Flash CT scanning?**

Ans

✘ 1. It uses conventional X-ray film

✔ 2. It allows ultra-fast imaging with reduced radiation dose

✘ 3. It eliminates the need for intravenous contrast

✘ 4. It does not require patient positioning

Q.35 **What is the optimal patient position for scanning the Achilles tendon using ultrasound?**

Ans

✘ 1. Sitting upright with knees flexed

✔ 2. Prone with feet hanging off the edge of the bed

✘ 3. Lateral decubitus

✘ 4. Supine with legs extended

Q.36 What is the role of fractionation in beam therapy?

Ans

✗ 1. To increase beam penetration

✓ 2. To divide the total radiation dose into multiple smaller doses over time

✗ 3. To target multiple tumors simultaneously

✗ 4. To administer chemotherapy alongside radiation

Q.37 What is a characteristic feature of acoustic enhancement artifact in ultrasound imaging?

Ans

✗ 1. Long acoustic shadow cast by small structures near the transducer

✗ 2. Unenhanced visualization of deep tissues

✓ 3. Increased echogenicity of structures distal to hypoechoic structure

✗ 4. Reflection of sound waves away from the transducer

Q.38 What is the primary reason for coherent scattering to be considered unimportant in diagnostic imaging?

Ans

✗ 1. It significantly contributes to patient dose.

✓ 2. It contributes less than 5% to total interactions and adds minimal image degradation.

✗ 3. It occurs only with high-energy radiation.

✗ 4. It produces a large number of ion pairs.

Q.39 Why is replenishment necessary in an automatic processor's developer tank?

Ans

✓ 1. To restore consumed preservatives and developing agents

✗ 2. To clean the rollers after each cycle

✗ 3. To prevent overheating of the solution

✗ 4. To improve image sharpness

Q.40 According to AERB guidelines, what is the minimum required of any one side dimension for a CT scan room?

Ans

✗ 1. 3 meters

✗ 2. 3.5 meters

✓ 3. 4 meters

✗ 4. 5 meters

Q.41 For an erect Skull PA projection, where should the patient’s head be positioned in relation to the receptor?

Ans

✗ 1. The head should be tilted back so that the occipital region is centered

✗ 2. The chin should be raised to ensure proper alignment

✓ 3. The forehead and nose should be in contact with the receptor

✗ 4. The patient’s head should be tilted 45° toward the left side

Q.42 What is the primary purpose of using sterile coverings on mobile fluoroscopy units during invasive procedures?

Ans

✓ 1. To prevent contamination and protect equipment and patient

✗ 2. To improve image quality

✗ 3. To ease equipment handling during surgery

✗ 4. To reduce radiation dose

Q.43 Which of the following statements about isotopes is TRUE?

Ans

✗ 1. All isotopes of an element have the same mass number

✓ 2. Isotopes have the same atomic number but different atomic masses

✗ 3. Isotopes have different numbers of protons and the same number of neutrons

✗ 4. Isotopes have identical nuclear compositions

Q.44 What is the primary benefit of using a balanced gradient system in balanced gradient echo sequences?

Ans

✗ 1. Enhances T1 contrast by using longer TRs

✗ 2. Causes complete dephasing of flowing blood and CSF

✓ 3. Maintains phase coherence in moving spins, resulting in high signal intensity

✗ 4. Reduces scan time by skipping RF excitation

Q.45 What is the primary function of the emulsion layer in a radiographic film?

Ans

✗ 1. To provide physical support to the film

✓ 2. To capture and store the latent image using light or x-ray sensitive crystals

✗ 3. To improve image sharpness through anti-scatter properties

✗ 4. To protect the film from mechanical damage

Q.46 Why should minimal exposure times (less than 0.02 seconds) be used in neonatal chest imaging?

Ans

✗ 1. To avoid overexposing soft tissues

✗ 2. To reduce radiation dose

✗ 3. To improve visualization of ossification centers

✓ 4. To prevent motion artefact

Q.47 What is thermionic emission in the context of x ray tube operation?

Ans

✗ 1. Production of radiation from interaction with photons

✗ 2. Emission of x-rays from the anode surface

✓ 3. Escape of electrons from a metal surafce due to heat energy

✗ 4. Movement of electrons within the atom's nucleus

Q.48 Why is it important to position the pelvis so that the anterior superior iliac spines are equidistant from the image receptor in an AP erect view?

Ans

✗ 1. To reduce magnification of abdominal structures

✗ 2. To ensure both kidneys are included in the image

✓ 3. To prevent rotation and obtain a true AP image

✗ 4. To ensure the median sagittal plane is perpendicular to the detector

Q.49 In an AP single hip radiograph, how is the central ray directed for optimal imaging?

Ans

✗ 1. 2.5 cm superior to the anterior superior iliac spine

✓ 2. 2.5 cm distal along the perpendicular bisector between the ASIS and the symphysis pubis

✗ 3. Midway between the iliac crest and the ischial tuberosity

✗ 4. Perpendicular to the greater trochanter

Q.50 In a scintillation detector, the role of the photomultiplier tube is to:

Ans

✗ 1. Block high-energy particles

✗ 2. Focus the radiation beam

✓ 3. Convert light pulses into electrical signals

✗ 4. Cool the detector during operation

Q.51 What is the purpose of the aluminum layer in a copper-aluminum compound filter?

Ans

✗ 1. To absorb low-energy scatter radiation from the patient

✓ 2. To absorb the characteristic radiation produced by copper

✗ 3. To enhance photoelectric effect in copper

✗ 4. To increase image contrast

Q.52 What happens to MRI signal in a vessel when flow velocity increases significantly?

Ans

✗ 1. Flow appears brighter due to increased signal

✗ 2. Flow related enhancement increases

✗ 3. There is no change in signal

✓ 4. High velocity signal loss occurs

Q.53 What is the main safety feature of a darkroom hopper used in radiography?

Ans

✗ 1. It operates automatically when a cassette is inserted

✗ 2. It develops films instantly

✓ 3. It has two light-tight and X-ray proof doors that cannot be opened simultaneously

✗ 4. It uses high-intensity light to clean cassettes

Q.54 Which of the following statements best explains why nuclei with an odd mass number are important in MRI?

Ans

✗ 1. Their electrons are more easily removed, making them highly magnetic.

✗ 2. They contain equal numbers of protons and neutrons, which enhances signal intensity.

✓ 3. The imbalance between protons and neutrons gives the nucleus a net spin, enabling interaction with magnetic fields.

✗ 4. They are heavier than even-mass nuclei, producing stronger resonance.

Q.55 Which of the following is a characteristic advantage of metal film hangers?

Ans

✗ 1. They are disposable and lightweight

✗ 2. They provide automatic digital scanning

✓ 3. They are durable and resistant to corrosion

✗ 4. They are only used for dental X-rays

Q.56 Which positioning device is often used during cranial radiography to maintain head stability?

Ans

✗ 1. Gonadal shield

✗ 2. Sandbags

✗ 3. Cervical collar

✓ 4. Skull clamp or head holder

Q.57 What is the purpose of the "Cleavage view" (CV) in mammography?

Ans

✓ 1. To image the posterior medial tissue of both breasts

✗ 2. To evaluate axillary tail of breast tissue

✗ 3. To assess microcalcifications

✗ 4. To visualize the nipple in profile

Q.58 Which of the following best describes phase mismapping (ghosting) artifact in MRI?

Ans

✗ 1. A loss of signal due to flow related enhancement

✗ 2. A distortion caused by metallic implants near the imaging area

✓ 3. A replication of moving anatomy along the phase encoding direction

✗ 4. A signal dropout from improper coil placement

Q.59 What is the primary purpose of bitewing radiography?

Ans

✗ 1. To examine the root tips of anterior teeth

✗ 2. To assess impacted wisdom teeth

✓ 3. To detect dental caries and assess restorations in premolar and molar teeth

✗ 4. To evaluate jaw fractures

Q.60 How many degrees does each phase in a three-phase generator lag behind the previous one?

Ans

✔ 1. 120°

✘ 2. 100°

✘ 3. 90°

✘ 4. 60°

Q.61 Which of the following is a recommended technique to reduce attenuation type artifacts in ultrasound imaging?

Ans

✘ 1. Apply color Doppler to enhance shadowing

✔ 2. Change the angle of the transducer to avoid dense structures

✘ 3. Use a higher-frequency transducer

✘ 4. Increase the gain to maximum

Q.62 Where should the central ray be directed for a standard Dorso-Plantar foot radiograph?

Ans

✘ 1. At the base of the first metatarsal

✘ 2. At the calcaneus

✘ 3. Just above the ankle joint

✔ 4. Over the cuboid–navicular joint between the navicular tuberosity and tuberosity of the 5th metatarsal

Q.63 What makes free radicals highly reactive and capable of causing cellular damage?

Ans

✔ 1. They have unpaired electrons

✘ 2. They carry a positive charge

✘ 3. They contain paired electrons

✘ 4. They are large molecules

Q.64 Why is the postero-anterior (PA) projection preferred for relatively fit patients during lumbar spine imaging?

Ans

✔ 1. It offers better visualization of disc spaces and sacro-iliac joints

✘ 2. It allows faster image acquisition

✘ 3. It provides a more comfortable position for the patient

✘ 4. It eliminates magnification of the spine

Q.65 In the lateral skull projection, where should the collimated horizontal x-ray beam be directed?

Ans

✘ 1. At a 45° angle to the patient's head

✘ 2. Parallel to the median sagittal plane

✔ 3. Parallel to the interpupillary line, at right angles to the median sagittal plane

✘ 4. Perpendicular to the floor of the cranial fossa

Q.66 What does the transformer law state about the relationship between voltage and the number of turns in the coils?

Ans

✔ 1. Voltage is proportional to the number of turns in the coils

✘ 2. Voltage is inversely proportional to the number of turns in both coils

✘ 3. Voltage depends only on the current flowing through the primary coil

✘ 4. Voltage is equal in both primary and secondary coils regardless of turns

Q.67 What does the term 'pitch' refer to in spiral/helical CT scanning?

Ans

✘ 1. The angle at which the X-ray beam enters the patient

✘ 2. The width of each CT slice

✘ 3. The number of detector rows in the scanner

✔ 4. The ratio of table travel per rotation to the total collimated X-ray beam width

Q.68 **Which of the following statements about coherent scattering is TRUE?**

Ans

✗ 1. It results in a change in both the direction and wavelength of the radiation

✓ 2. It includes Thomson and Rayleigh types and does not change the wavelength of radiation

✗ 3. It involves energy transfer and ionization of the atom

✗ 4. Rayleigh scattering involves interaction with a single electron

Q.69 **What does the atomic number (Z) of an atom represent?**

Ans

✗ 1. The number of electrons in the outer shell

✓ 2. The number of protons in the nucleus

✗ 3. The number of neutrons in the atom

✗ 4. The total number of protons and neutrons

Q.70 **Which of the following is NOT a recommended characteristic of a darkroom floor in radiology?**

Ans

✗ 1. Durable and easy to maintain

✗ 2. Non-slippery

✗ 3. Chemical resistant

✓ 4. Porous and stain-absorbent