

ADVANCED RADIOGRAPHY

PRACTICE SETS & MOCK EXAMS

600 MCQs with Answers & Explanations
Master High-Yield Concepts in X-Ray, CT, MRI, PACS,
Positioning & More

What's Inside:

- ✓ Set 10: 500 Challenging MCQs (50 per mini-set)
- ✓ 2 Full-Length Mock Exams (100 questions)
- ✓ Detailed Explanations, Concept Reinforcement, and Clinical Applications

Ideal for:

- ✓ DRT / B.Sc. Radiography Students
- ✓ AIIMS / PGI / NEET-PG Radiology Aspirants
- ✓ ARRT, HCPC & Global Licensing Exams
- ✓ Competitive Radiography & Imaging Tests

Compiled by:

Red Tech Official for Radiographer

*A trusted name in radiography education & exam preparation

Preface

Radiologic technology is an ever-evolving field that demands excellence in both academic knowledge and clinical application. To help bridge the gap between theoretical learning and real-world diagnostics, this book — “**Advanced Radiography Practice Sets & Mock Exams**” — provides a powerful, exam-focused question bank of **600 MCQs** designed for serious radiography learners and competitive exam aspirants.

The book is divided into **two main sections**:

1. **Practice Set 10:** A comprehensive bank of **500 MCQs** arranged in 10 specialized mini-sets (50 questions each), covering imaging physics, positioning, cross-sectional anatomy, digital radiography, artifacts, safety protocols, and more.
2. **Mock Exam Section:** Two full-length **Advanced Radiography Mock Exams** (50 questions each), reflecting real-time exam scenarios with **answers and detailed explanations**.

Whether you’re preparing for DRT, B.Sc. Radiography, PGI, AIIMS, NEET-PG Radiology, ARRT, or HCPC certifications — this question collection is built to refine your accuracy, improve speed, and reinforce critical concepts. Every question encourages clinical reasoning and real-world diagnostic understanding, rather than rote memory.

“Mastering radiography is not about memorizing—it’s about applying.”

Prepared by:
Red Tech Official for Radiographer
For exam-focused radiography education

Send your suggestions or any corrections redtechofficial2020@gmail.com

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Each set contains 50 clinically oriented MCQs

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Mock Exam Section – Full-Length Simulations

Mock Exam	Title	Question Nos.
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Set B	Advanced Radiography Mock Exam – B	Q551–Q600

Total Questions: 600

Practice Set 1

Topics Covered: Skeletal System Anatomy (Axial & Appendicular), Muscular System (Structure & Function)

1. Which of the following is NOT part of the axial skeleton?

- A. Skull
- B. Sternum
- C. Pelvic girdle
- D. Vertebral column

2. The bone that does not articulate with any other bone is:

- A. Hyoid
- B. Mandible
- C. Temporal
- D. Clavicle

3. The number of thoracic vertebrae is:

- A. 5
- B. 7
- C. 12
- D. 10

4. The femur is classified as a:

- A. Short bone
- B. Irregular bone
- C. Flat bone
- D. Long bone

5. The functional unit of compact bone is called the:

- A. Sarcomere
- B. Osteon
- C. Lacuna
- D. Trabecula

6. The shoulder girdle includes:

- A. Humerus and clavicle
- B. Clavicle and scapula
- C. Scapula and sternum
- D. Humerus and radius

7. The joint between the atlas and axis allows for:

- A. Nodding "yes"
- B. Shaking head "no"
- C. Shoulder rotation
- D. Flexion of lumbar spine

8. The largest and strongest bone in the face is:

- A. Maxilla
- B. Zygomatic
- C. Nasal
- D. Mandible

9. How many ribs are classified as "true ribs"?

- A. 5
- B. 7
- C. 10
- D. 12

10. The cribriform plate is part of which bone?

- A. Ethmoid
- B. Sphenoid
- C. Frontal
- D. Temporal

11. The acetabulum is found in the:

- A. Scapula
- B. Ilium
- C. Pelvis
- D. Femur

12. The foramen magnum is located in which bone?

- A. Frontal
- B. Occipital
- C. Parietal
- D. Sphenoid

13. The sternum consists of how many parts?

- A. 1
- B. 2
- C. 3
- D. 4

14. The patella is a:

- A. Flat bone
- B. Sesamoid bone
- C. Irregular bone
- D. Long bone

15. Which bone forms the anterior part of the hard palate?

- A. Maxilla
- B. Palatine
- C. Vomer
- D. Zygomatic

16. The spinal curvature that develops when a baby begins to sit is:

- A. Thoracic
- B. Sacral
- C. Lumbar
- D. Cervical

17. The longest bone in the body is the:

- A. Tibia
- B. Humerus
- C. Femur
- D. Fibula

18. The carpal bone that articulates with the radius is the:

- A. Scaphoid
- B. Pisiform
- C. Lunate
- D. Hamate

19. The bone that forms the lateral portion of the orbit is the:

- A. Lacrimal
- B. Ethmoid
- C. Zygomatic
- D. Nasal

20. The number of bones in the adult human skeleton is:

- A. 200
- B. 206
- C. 212
- D. 218

21. The deltoid muscle is responsible for:

- A. Arm flexion
- B. Arm extension
- C. Arm abduction
- D. Arm adduction

22. The hamstrings are located in the:

- A. Front of thigh
- B. Back of thigh
- C. Back of arm
- D. Calf

23. The smallest skeletal muscle is:

- A. Masseter
- B. Sartorius
- C. Stapedius
- D. Buccinator

24. The functional unit of a muscle fiber is the:

- A. Sarcomere
- B. Myofibril
- C. Actin
- D. Myosin

25. Which muscle assists in chewing?

- A. Deltoid
 - B. Masseter
 - C. Trapezius
 - D. Sternocleidomastoid
-

26. The gastrocnemius is located in the:

- A. Thigh
- B. Foot
- C. Calf
- D. Forearm

27. The biceps brachii muscle lies:

- A. Anterior arm
- B. Posterior forearm
- C. Anterior forearm
- D. Posterior thigh

28. The quadriceps group includes all EXCEPT:

- A. Rectus femoris
- B. Vastus lateralis
- C. Vastus intermedius
- D. Biceps femoris

29. Muscle contraction is triggered by:

- A. Calcium release
- B. Potassium influx
- C. DNA replication
- D. Collagen formation

30. The diaphragm is involved in:

- A. Digestion
 - B. Breathing
 - C. Vision
 - D. Speech
-

31. A muscle that opposes the action of another is called:

- A. Agonist
- B. Synergist
- C. Antagonist
- D. Fixator

32. The strongest muscle in the body is:

- A. Sartorius
- B. Gluteus maximus
- C. Rectus abdominis
- D. Masseter

33. Which of the following is a voluntary muscle?

- A. Cardiac
- B. Smooth
- C. Skeletal
- D. Involuntary

34. Which protein binds calcium in muscle contraction?

- A. Actin
- B. Myosin
- C. Troponin
- D. Tropomyosin

35. The insertion of the biceps brachii is on the:

- A. Ulna
 - B. Radius
 - C. Humerus
 - D. Scapula
-

36. Which muscle forms the calf along with gastrocnemius?

- A. Soleus
- B. Sartorius
- C. Peroneus
- D. Tibialis anterior

37. Which muscle rotates the forearm?

- A. Biceps brachii
- B. Supinator
- C. Trapezius
- D. Rectus abdominis

38. Which muscle closes the jaw?

- A. Platysma
- B. Orbicularis oris
- C. Masseter
- D. Frontalis

39. The “tailor’s muscle” is:

- A. Sartorius
- B. Gracilis
- C. Rectus femoris
- D. Pectineus

40. Which muscle forms the anterior abdominal wall?

- A. Rectus femoris
- B. Rectus abdominis
- C. Obliques
- D. Transversus thoracis

41. Myosin heads bind to:

- A. Actin
- B. Troponin
- C. ATP
- D. Calcium

42. Which muscle helps in shrugging the shoulders?

- A. Pectoralis
- B. Trapezius
- C. Latissimus dorsi
- D. Deltoid

43. Which muscle flexes the elbow?

- A. Triceps brachii
- B. Biceps brachii
- C. Extensor carpi
- D. Teres major

44. Which muscle is NOT in the rotator cuff group?

- A. Supraspinatus
- B. Infraspinatus
- C. Subscapularis
- D. Teres major

45. The major hip extensor muscle is:

- A. Gluteus maximus
- B. Iliopsoas
- C. Sartorius
- D. Piriformis

46. What connective tissue wraps each individual muscle fiber?

- A. Epimysium
- B. Perimysium
- C. Endomysium
- D. Fascicle

47. Which muscle helps with inspiration?

- A. Diaphragm
- B. Rectus abdominis
- C. Sternocleidomastoid
- D. Serratus anterior

48. The orbicularis oculi controls:

- A. Eye blinking
- B. Jaw movement
- C. Chewing
- D. Lip motion

49. The antagonist of the quadriceps group is the:

- A. Hamstrings
- B. Gastrocnemius
- C. Gluteus minimus
- D. Tensor fasciae latae

50. Which muscle rotates the head side to side?

- A. Trapezius
- B. Deltoid
- C. Sternocleidomastoid
- D. Masseter

Answer Key with Explanations:

1. ✓C – Pelvic girdle is part of appendicular skeleton.
2. ✓A – Hyoid does not articulate with any bone.
3. ✓C – 12 thoracic vertebrae.
4. ✓D – Femur is a long bone.
5. ✓B – Osteon is the compact bone unit.
6. ✓B – Shoulder girdle = clavicle + scapula.
7. ✓B – Atlas-axis joint allows rotation ("no").
8. ✓D – Mandible is the largest facial bone.
9. ✓B – First 7 ribs are true ribs.
10. ✓A – Cribriform plate is in the ethmoid.
11. ✓C – Acetabulum is part of the pelvis.
12. ✓B – Foramen magnum is in the occipital bone.
13. ✓C – Sternum has 3 parts: manubrium, body, xiphoid.
14. ✓B – Patella is a sesamoid bone.
15. ✓A – Maxilla forms anterior hard palate.
16. ✓C – Lumbar curve develops during sitting.
17. ✓C – Femur is the longest bone.
18. ✓A – Scaphoid articulates with the radius.
19. ✓C – Zygomatic forms lateral orbit.
20. ✓B – Adult skeleton has 206 bones.
21. ✓C – Deltoid abducts the arm.
22. ✓B – Hamstrings are in the back of thigh.
23. ✓C – Stapedius is the smallest muscle.

24. ✓A – Sarcomere is the muscle fiber unit.
25. ✓B – Masseter helps in chewing.
26. ✓C – Gastrocnemius is in the calf.
27. ✓A – Biceps is on the anterior arm.
28. ✓D – Biceps femoris is a hamstring.
29. ✓A – Calcium triggers muscle contraction.
30. ✓B – Diaphragm controls breathing.
31. ✓C – Antagonist opposes movement.
32. ✓D – Masseter is the strongest (by force/area).
33. ✓C – Skeletal muscle is voluntary.
34. ✓C – Troponin binds calcium.
35. ✓B – Biceps inserts on radius.
36. ✓A – Soleus + gastrocnemius = calf.
37. ✓B – Supinator rotates forearm.
38. ✓C – Masseter closes jaw.
39. ✓A – Sartorius is tailor's muscle.
40. ✓B – Rectus abdominis forms the "six-pack".
41. ✓A – Myosin binds actin.
42. ✓B – Trapezius shrugs shoulders.
43. ✓B – Biceps flexes elbow.
44. ✓D – Teres major is not part of rotator cuff.
45. ✓A – Gluteus maximus extends hip.
46. ✓C – Endomysium wraps each muscle fiber.
47. ✓A – Diaphragm aids inspiration.
48. ✓A – Orbicularis oculi closes eyelids.
49. ✓A – Hamstrings oppose quadriceps.
50. ✓C – Sternocleidomastoid rotates head.

Practice Set 2

Topics Covered: Nervous System (Brain, Spine, Nerves) & Cardiovascular System (Heart, Vessels, Circulation)

Total: 50 MCQs |

1. The part of the brain responsible for coordination and balance is:

- A. Cerebrum
- B. Cerebellum
- C. Medulla
- D. Thalamus

2. The cerebrospinal fluid (CSF) is primarily produced in:

- A. Cerebral cortex
- B. Ventricles
- C. Subarachnoid space
- D. Pituitary gland

3. The autonomic nervous system controls:

- A. Voluntary muscles
- B. Sensory perception
- C. Involuntary functions
- D. Thought processes

4. Which cranial nerve is responsible for vision?

- A. Optic (II)
- B. Oculomotor (III)
- C. Facial (VII)
- D. Trigeminal (V)

5. The spinal cord ends at the level of:

- A. C7
- B. L1–L2
- C. T12
- D. S1

6. The central sulcus separates:

- A. Frontal and temporal lobes
- B. Occipital and parietal lobes
- C. Frontal and parietal lobes
- D. Cerebellum and medulla

7. The part of the neuron that receives signals is the:

- A. Axon
- B. Soma
- C. Myelin
- D. Dendrite

8. Which meninges are closest to the brain surface?

- A. Dura mater
- B. Arachnoid mater
- C. Pia mater
- D. Subarachnoid

9. Broca's area is associated with:

- A. Smell
- B. Speech production
- C. Balance
- D. Emotion

10. The "butterfly" appearance in spinal cord cross-section is formed by:

- A. White matter
- B. Dorsal roots
- C. Gray matter
- D. Pia mater

11. The blood-brain barrier is composed mainly of:

- A. Neurons
- B. Astrocytes and endothelial cells
- C. Capillaries
- D. Myelin

12. The nerve responsible for diaphragm movement is:

- A. Vagus
- B. Phrenic
- C. Hypoglossal
- D. Accessory

13. The largest part of the brain is the:

- A. Cerebellum
- B. Brainstem
- C. Cerebrum
- D. Medulla

14. Parkinson's disease is due to loss of neurons in the:

- A. Cerebellum
- B. Substantia nigra
- C. Pons
- D. Corpus callosum

15. The corpus callosum connects:

- A. Brainstem and spinal cord
 - B. Cerebral hemispheres
 - C. Cerebellar hemispheres
 - D. Ventricles
-

16. Stroke due to MCA occlusion typically affects:

- A. Vision only
- B. Lower limbs
- C. Face and upper limb
- D. Hearing

17. The thalamus is best described as:

- A. Motor relay center
- B. Emotional center
- C. Sensory relay center
- D. Sleep regulator

18. Sensory signals from the body enter the spinal cord via:

- A. Ventral root
- B. Dorsal root
- C. Central canal
- D. Spinothalamic tract

19. The parasympathetic system originates from:

- A. Cervical spine
- B. Thoracolumbar spine
- C. Craniosacral regions
- D. Lumbosacral regions

20. Myelin in the CNS is produced by:

- A. Schwann cells
 - B. Ependymal cells
 - C. Astrocytes
 - D. Oligodendrocytes
-

21. The heart chamber with the thickest wall is the:

- A. Right atrium
- B. Left atrium
- C. Left ventricle
- D. Right ventricle

22. Oxygenated blood from the lungs enters the heart via:

- A. Pulmonary arteries
- B. Pulmonary veins
- C. Aorta
- D. Inferior vena cava

23. The pacemaker of the heart is the:

- A. AV node
- B. Purkinje fibers
- C. SA node
- D. Bundle of His

24. The tricuspid valve separates:

- A. Right atrium and right ventricle
- B. Left atrium and left ventricle
- C. Left atrium and aorta
- D. Right ventricle and pulmonary artery

25. Which vessel supplies the heart muscle itself?

- A. Pulmonary artery
 - B. Coronary arteries
 - C. Aorta
 - D. Jugular vein
-

26. Blood pressure is highest in the:

- A. Capillaries
- B. Arterioles
- C. Arteries
- D. Veins

27. The QRS complex represents:

- A. Atrial contraction
- B. Ventricular depolarization
- C. Atrial repolarization
- D. Ventricular filling

28. The first heart sound is due to:

- A. Closure of semilunar valves
- B. Opening of mitral valve
- C. Closure of AV valves
- D. Atrial contraction

29. In fetal circulation, oxygenated blood is carried by:

- A. Umbilical artery
- B. Umbilical vein
- C. Ductus venosus
- D. Foramen ovale

30. The aortic valve is located between:

- A. Left atrium and aorta
- B. Left ventricle and aorta
- C. Right ventricle and aorta
- D. Left ventricle and pulmonary artery

31. The vein draining the brain is the:

- A. Brachiocephalic vein
- B. Jugular vein
- C. Subclavian vein
- D. Coronary sinus

32. Atherosclerosis is best defined as:

- A. Inflammation of arteries
- B. Thickening and hardening of arteries due to plaque
- C. Blood clot formation
- D. Rupture of vessels

33. The largest artery in the body is the:

- A. Pulmonary artery
- B. Coronary artery
- C. Aorta
- D. Carotid artery

34. The pulse is usually taken over the:

- A. Brachial artery
- B. Ulnar artery
- C. Radial artery
- D. Subclavian artery

35. The coronary sinus opens into the:

- A. Right atrium
- B. Left atrium
- C. Right ventricle
- D. Pulmonary artery

36. The vessel that carries deoxygenated blood to the lungs is:

- A. Aorta
- B. Pulmonary vein
- C. Pulmonary artery
- D. Superior vena cava

37. Varicose veins result from:

- A. Hypertension
- B. Valve failure in veins
- C. Blood clotting
- D. Artery rupture

38. The layer of blood vessels responsible for vasoconstriction:

- A. Tunica intima
- B. Tunica media
- C. Tunica adventitia
- D. Endothelium

39. Bradycardia is defined as:

- A. Fast heart rate >100 bpm
- B. Normal sinus rhythm
- C. Slow heart rate <60 bpm
- D. Irregular rhythm

40. The AV node is located in the:

- A. Interatrial septum
- B. Left ventricle
- C. Aorta
- D. SA node

41. Cardiac output =

- A. Stroke volume + heart rate
- B. Heart rate \times stroke volume
- C. Blood pressure \times resistance
- D. Preload – afterload

42. Which artery supplies the kidneys?

- A. Iliac
- B. Renal
- C. Mesenteric
- D. Hepatic

43. The vessel used for coronary angiography is usually the:

- A. Carotid artery
- B. Radial or femoral artery
- C. Brachial vein
- D. Subclavian vein

44. Hypotension refers to:

- A. High blood pressure
- B. Low blood pressure
- C. Low oxygen
- D. High oxygen

45. The pericardium is:

- A. Heart valve
 - B. Muscle of heart
 - C. Membrane enclosing the heart
 - D. Heart chamber
-

46. The "dub" heart sound is caused by:

- A. AV valve closure
- B. Semilunar valve closure
- C. Opening of mitral valve
- D. Atrial systole

47. Which vein returns blood from the lower body?

- A. Jugular
- B. Superior vena cava
- C. Inferior vena cava
- D. Subclavian

48. The wall of the left ventricle is thick due to:

- A. More nerves
- B. Pumps blood to lungs
- C. Pumps blood to body
- D. Contains more valves

49. Tachycardia is defined as:

- A. Heart rate <60 bpm
- B. Normal heart rate
- C. Irregular heart rhythm
- D. Heart rate >100 bpm

50. Which structure prevents backflow into the left atrium?

- A. Aortic valve
 - B. Tricuspid valve
 - C. Mitral valve
 - D. Pulmonary valve
-

Answer Key with Explanations:

1. ✓B – Cerebellum controls balance and coordination.
2. ✓B – CSF is produced in the ventricles by choroid plexus.
3. ✓C – Autonomic system handles involuntary control (heart, glands).
4. ✓A – Optic nerve (CN II) transmits vision.
5. ✓B – Spinal cord ends at L1–L2 in adults.
6. ✓C – Central sulcus separates frontal and parietal lobes.
7. ✓D – Dendrites receive incoming signals.
8. ✓C – Pia mater is the innermost layer.
9. ✓B – Broca's area controls speech production.
10. ✓C – Gray matter forms the butterfly shape in spinal cord.
11. ✓B – Blood-brain barrier formed by astrocytes + endothelial cells.
12. ✓B – Phrenic nerve controls diaphragm.
13. ✓C – Cerebrum is the largest brain part.
14. ✓B – Substantia nigra degeneration causes Parkinson's.
15. ✓B – Corpus callosum connects the hemispheres.
16. ✓C – MCA stroke affects face and arm most.
17. ✓C – Thalamus is relay station for sensory info.
18. ✓B – Dorsal root carries sensory input to spinal cord.
19. ✓C – Parasympathetic system arises from craniosacral regions.
20. ✓D – Oligodendrocytes form myelin in CNS.
21. ✓C – Left ventricle pumps blood to entire body → thickest.
22. ✓B – Pulmonary veins bring oxygenated blood from lungs.
23. ✓C – SA node initiates heart rhythm (pacemaker).
24. ✓A – Tricuspid valve is between right atrium and right ventricle.
25. ✓B – Coronary arteries supply blood to heart muscle.
26. ✓C – Arteries have highest pressure.
27. ✓B – QRS = ventricular depolarization.
28. ✓C – First heart sound = AV valve closure.
29. ✓B – Umbilical vein carries oxygenated blood in fetus.
30. ✓B – Aortic valve lies between LV and aorta.
31. ✓B – Jugular veins drain blood from brain.
32. ✓B – Atherosclerosis = plaque deposition in arteries.
33. ✓C – Aorta is the body's largest artery.
34. ✓C – Radial artery is common for pulse.
35. ✓A – Coronary sinus drains into right atrium.
36. ✓C – Pulmonary artery carries deoxygenated blood to lungs.
37. ✓B – Varicose veins result from valve failure.

- 38. ✓B – Tunica media is smooth muscle layer (controls constriction).
 - 39. ✓C – Bradycardia = HR <60 bpm.
 - 40. ✓A – AV node sits in interatrial septum.
 - 41. ✓B – CO = HR × stroke volume.
 - 42. ✓B – Renal artery supplies kidneys.
 - 43. ✓B – Radial/femoral artery is used in cath lab for angiography.
 - 44. ✓B – Hypotension = low BP.
 - 45. ✓C – Pericardium is the membrane around the heart.
 - 46. ✓B – “Dub” = semilunar valve closure.
 - 47. ✓C – IVC returns blood from below diaphragm.
 - 48. ✓C – LV wall is thick to pump blood throughout body.
 - 49. ✓D – Tachycardia = HR >100 bpm.
 - 50. ✓C – Mitral valve prevents backflow into LA.
-

Practice Set 3

Topics Covered: Respiratory System (Lungs, Trachea, Gas Exchange) & Digestive System (GI Tract, Enzymes, Absorption)

Total: 50 MCQs |

1. The primary muscle of inspiration is the:

- A. Intercostal muscles
- B. Sternocleidomastoid
- C. Diaphragm
- D. Pectoralis major

2. The site of gas exchange in the lungs is the:

- A. Bronchi
- B. Bronchioles
- C. Alveoli
- D. Trachea

3. Oxygenated blood from the lungs returns to the heart via:

- A. Pulmonary artery
- B. Aorta
- C. Pulmonary vein
- D. Inferior vena cava

4. The trachea divides into the right and left bronchi at the level of:

- A. T2
- B. T4–T5 (sternal angle)
- C. T10
- D. C7

5. The pleura that covers the surface of the lungs is called:

- A. Parietal pleura
 - B. Visceral pleura
 - C. Pleural cavity
 - D. Mediastinum
-

6. The structure that prevents food from entering the trachea is:

- A. Uvula
- B. Soft palate
- C. Epiglottis
- D. Tonsil

7. The phrenic nerve arises from:

- A. C3–C5
- B. T1–T3
- C. L1–L3
- D. C1–C2

8. The most common site of foreign body aspiration in adults is:

- A. Left main bronchus
- B. Right main bronchus
- C. Trachea
- D. Esophagus

9. Which of the following is NOT a function of the respiratory system?

- A. Gas exchange
- B. Sound production
- C. pH regulation
- D. Nutrient absorption

10. The lung lobe NOT present on the left side is the:

- A. Upper lobe
 - B. Middle lobe
 - C. Lower lobe
 - D. Lingula
-

11. The control center for respiration is located in the:

- A. Cerebellum
- B. Medulla oblongata
- C. Thalamus
- D. Cerebrum

12. The term "tidal volume" refers to:

- A. Air in lungs after expiration
- B. Air during forced breathing
- C. Air inhaled/exhaled in a normal breath
- D. Maximum air volume in lungs

13. Surfactant in the lungs:

- A. Absorbs oxygen
- B. Prevents alveolar collapse
- C. Triggers coughing
- D. Promotes fibrosis

14. Which imaging view best detects a pneumothorax?

- A. AP erect
- B. PA erect
- C. Expiratory view
- D. Supine

15. The "air bronchogram" sign is typical of:

- A. COPD
 - B. Atelectasis
 - C. Pulmonary edema
 - D. Consolidation
-

16. The initial portion of the small intestine is the:

- A. Jejunum
- B. Duodenum
- C. Ileum
- D. Cecum

17. The digestive organ that produces insulin is the:

- A. Liver
- B. Pancreas
- C. Stomach
- D. Spleen

18. The main function of the large intestine is:

- A. Nutrient absorption
- B. Water reabsorption
- C. Protein digestion
- D. Fat emulsification

19. The enzyme pepsin begins digestion of:

- A. Carbohydrates
- B. Fats
- C. Proteins
- D. Nucleic acids

20. Which organ stores bile?

- A. Pancreas
- B. Duodenum
- C. Gallbladder
- D. Liver

21. The longest part of the GI tract is the:

- A. Duodenum
- B. Jejunum
- C. Ileum
- D. Colon

22. The portal vein carries blood from:

- A. Heart to liver
- B. Liver to stomach
- C. GI tract to liver
- D. Kidneys to GI

23. Villi are primarily present in:

- A. Esophagus
- B. Stomach
- C. Small intestine
- D. Colon

24. The appendix is attached to the:

- A. Ileum
- B. Cecum
- C. Jejunum
- D. Rectum

25. Barium studies of the small bowel typically visualize up to:

- A. Duodenum
- B. Jejunum
- C. Terminal ileum
- D. Colon

26. Which vitamin is produced by gut flora?

- A. A
- B. B6
- C. K
- D. E

27. The enzyme amylase is secreted by:

- A. Liver
- B. Stomach
- C. Salivary glands and pancreas
- D. Gallbladder

28. The sphincter controlling gastric emptying is the:

- A. Cardiac sphincter
- B. Pyloric sphincter
- C. Ileocecal valve
- D. Anal sphincter

29. Reflux esophagitis results from dysfunction of:

- A. Pyloric sphincter
- B. Cardiac sphincter
- C. Anal sphincter
- D. Upper esophageal sphincter

30. The liver is located in the:

- A. Right lower quadrant
- B. Left upper quadrant
- C. Right upper quadrant
- D. Left lower quadrant

31. Which organ detoxifies chemicals and drugs?

- A. Spleen
- B. Liver
- C. Kidney
- D. Pancreas

32. The brush border enzyme lactase breaks down:

- A. Protein
- B. Starch
- C. Lactose
- D. Fat

33. In which part of the GI tract does most digestion occur?

- A. Mouth
- B. Stomach
- C. Small intestine
- D. Colon

34. The hormone that stimulates bile release is:

- A. Gastrin
- B. Secretin
- C. CCK
- D. Insulin

35. The rectum ends in the:

- A. Cecum
 - B. Anal canal
 - C. Sigmoid colon
 - D. Ileum
-

36. Haustra are characteristic of:

- A. Small intestine
- B. Colon
- C. Stomach
- D. Duodenum

37. The gallbladder releases bile into the:

- A. Jejunum
- B. Common bile duct
- C. Portal vein
- D. Colon

38. The pancreas is both:

- A. Endocrine
- B. Exocrine
- C. Both endocrine and exocrine
- D. Neither

39. The most distal part of the small intestine is:

- A. Jejunum
- B. Duodenum
- C. Ileum
- D. Cecum

40. The digestive system begins at the:

- A. Esophagus
 - B. Stomach
 - C. Pharynx
 - D. Mouth
-

41. Which nutrient begins digestion in the mouth?

- A. Protein
- B. Carbohydrate
- C. Fat
- D. Water

42. The term "peristalsis" refers to:

- A. Enzyme secretion
- B. Hormone absorption
- C. Muscle contractions moving food
- D. Acid release

43. Rugae are folds seen in the:

- A. Colon
- B. Stomach
- C. Liver
- D. Esophagus

44. Peyer's patches are found in the:

- A. Jejunum
- B. Duodenum
- C. Ileum
- D. Colon

45. The enzyme lipase digests:

- A. Carbohydrates
 - B. Proteins
 - C. Fats
 - D. Fiber
-

46. Which condition shows "thumbprinting" on barium study?

- A. Ulcerative colitis
- B. Ischemic colitis
- C. Crohn's disease
- D. IBS

47. String sign on barium meal suggests:

- A. Esophageal varices
- B. Crohn's disease
- C. Intussusception
- D. Duodenal ulcer

48. Apple-core lesion indicates:

- A. Polyp
- B. Colon cancer
- C. IBS
- D. Adhesions

49. The most common cause of small bowel obstruction:

- A. Adhesions
- B. Hernia
- C. Tumor
- D. Volvulus

50. Meckel's diverticulum arises from:

- A. Sigmoid
- B. Stomach
- C. Terminal ileum
- D. Ascending colon

Answer Key with Explanations:

1. ✓C – Diaphragm is the main inspiratory muscle.
2. ✓C – Alveoli are the site of gas exchange.
3. ✓C – Pulmonary veins return oxygenated blood.
4. ✓B – Tracheal bifurcation is at T4–T5 (carina).
5. ✓B – Visceral pleura directly covers lungs.
6. ✓C – Epiglottis prevents aspiration.
7. ✓A – Phrenic nerve originates from C3–C5.
8. ✓B – Right bronchus is wider and more vertical.
9. ✓D – Nutrient absorption is GI system's job.

10. ✓B – Left lung lacks a middle lobe.
 11. ✓B – Medulla regulates breathing.
 12. ✓C – Tidal volume is normal breath volume.
 13. ✓B – Surfactant reduces surface tension.
 14. ✓C – Expiratory view best shows pneumothorax.
 15. ✓D – Air bronchogram = consolidation.
 16. ✓B – Duodenum is first part of small intestine.
 17. ✓B – Pancreas makes insulin.
 18. ✓B – Large intestine absorbs water.
 19. ✓C – Pepsin digests proteins.
 20. ✓C – Bile is stored in gallbladder.
 21. ✓C – Ileum is the longest GI segment.
 22. ✓C – Portal vein drains GI tract to liver.
 23. ✓C – Villi are in the small intestine.
 24. ✓B – Appendix connects to cecum.
 25. ✓C – Small bowel follow-through reaches terminal ileum.
 26. ✓C – Gut flora synthesize vitamin K.
 27. ✓C – Amylase comes from salivary glands and pancreas.
 28. ✓B – Pyloric sphincter controls gastric outflow.
 29. ✓B – Reflux occurs at cardiac sphincter.
 30. ✓C – Liver is in right upper quadrant.
 31. ✓B – Liver detoxifies drugs and toxins.
 32. ✓C – Lactase digests lactose.
 33. ✓C – Most digestion occurs in small intestine.
 34. ✓C – CCK stimulates bile release.
 35. ✓B – Rectum ends in anal canal.
 36. ✓B – Haustra = sacculations of colon.
 37. ✓B – Bile enters common bile duct.
 38. ✓C – Pancreas has endocrine and exocrine functions.
 39. ✓C – Ileum is the last part of small intestine.
 40. ✓D – GI tract begins at mouth.
 41. ✓B – Salivary amylase starts carb digestion.
 42. ✓C – Peristalsis = muscle contraction to move food.
 43. ✓B – Rugae are folds in the stomach.
 44. ✓C – Peyer's patches are in ileum (lymphoid).
 45. ✓C – Lipase breaks down fats.
 46. ✓B – "Thumbprinting" = thickened bowel wall in ischemia.
 47. ✓B – "String sign" = Crohn's disease.
 48. ✓B – Apple-core lesion = colon cancer.
 49. ✓A – Adhesions are most common cause of SBO.
 50. ✓C – Meckel's arises from terminal ileum.
-

Practice Set 4

Topics Covered: Urinary System & Reproductive System (Anatomy, Function, Imaging, Pathology)

Total: 50 MCQs |

1. The functional unit of the kidney is the:

- A. Nephron
- B. Glomerulus
- C. Loop of Henle
- D. Bowman's capsule

2. Urine formation begins in the:

- A. Collecting duct
- B. Ureter
- C. Glomerulus
- D. Bladder

3. The kidney is located at the vertebral levels of:

- A. T5–T8
- B. T10–L1
- C. T12–L3
- D. L4–L5

4. The hormone that increases water reabsorption in the kidneys is:

- A. ADH
- B. Aldosterone
- C. Renin
- D. Insulin

5. The structure that carries urine from kidney to bladder:

- A. Urethra
 - B. Renal vein
 - C. Ureter
 - D. Nephron
-

6. The right kidney lies:

- A. Higher than left
- B. Same level as left
- C. Lower than left
- D. Retroperitoneally in thorax

7. The renal medulla contains:

- A. Glomeruli
- B. Renal columns
- C. Renal pyramids
- D. Capsule

8. Which imaging modality is best for detecting renal calculi?

- A. X-ray
- B. CT
- C. MRI
- D. PET

9. Which structure is NOT part of the nephron?

- A. Glomerulus
- B. Loop of Henle
- C. Collecting duct
- D. Ureter

10. The outermost layer of the kidney is the:

- A. Cortex
- B. Medulla
- C. Renal pelvis
- D. Capsule

11. The normal capacity of the urinary bladder is about:

- A. 100 mL
- B. 300 mL
- C. 500 mL
- D. 1000 mL

12. The male urethra passes through all EXCEPT:

- A. Prostate
- B. Penis
- C. Seminal vesicle
- D. Urogenital diaphragm

13. The main function of the renal pelvis is to:

- A. Filter blood
- B. Secrete renin
- C. Collect urine from calyces
- D. Absorb sodium

14. The hilum of the kidney is the site where:

- A. Urine exits the bladder
- B. Vessels and ureter enter/exit
- C. Filtration occurs
- D. Nephrons are stored

15. The glomerular filtration rate (GFR) is primarily regulated by:

- A. Heart rate
- B. Liver function
- C. Blood pressure
- D. Insulin

16. Horseshoe kidney is a:

- A. Type of tumor
- B. Congenital fusion anomaly
- C. Infection
- D. Cystic disease

17. The vesicoureteral junction is between:

- A. Kidney and ureter
- B. Ureter and bladder
- C. Bladder and urethra
- D. Nephron and ureter

18. In females, the urethra is approximately:

- A. 2–4 cm long
- B. 10 cm
- C. 15 cm
- D. 20 cm

19. Creatinine is a by-product of:

- A. Carbohydrate metabolism
- B. Fat digestion
- C. Muscle metabolism
- D. Bile breakdown

20. A non-contrast CT KUB is ideal for:

- A. Tumor staging
- B. Stone detection
- C. Bladder rupture
- D. Renal trauma

21. The hormone stimulating sperm production is:

- A. LH
- B. FSH
- C. Testosterone
- D. Prolactin

22. The site of sperm production is the:

- A. Epididymis
- B. Prostate
- C. Seminiferous tubules
- D. Vas deferens

23. The structure that stores and matures sperm:

- A. Seminal vesicle
- B. Prostate
- C. Epididymis
- D. Penis

24. The tube that carries sperm from testis to urethra:

- A. Ureter
- B. Vas deferens
- C. Urethra
- D. Ejaculatory duct

25. Semen is produced by all EXCEPT:

- A. Seminal vesicle
 - B. Prostate
 - C. Bulbourethral glands
 - D. Bladder
-

26. The female gonads are the:

- A. Ovaries
- B. Uterus
- C. Fallopian tubes
- D. Vagina

27. Fertilization usually occurs in the:

- A. Uterus
- B. Ovary
- C. Vagina
- D. Fallopian tube

28. The layer of the uterus shed during menstruation:

- A. Myometrium
- B. Endometrium
- C. Perimetrium
- D. Serosa

29. The hormone that triggers ovulation:

- A. FSH
- B. Estrogen
- C. Progesterone
- D. LH

30. The normal position of the uterus is:

- A. Retroverted
 - B. Anteverted
 - C. Inverted
 - D. Horizontal
-

31. The menstrual cycle is regulated by:

- A. Hypothalamus
- B. Ovary
- C. Pituitary gland
- D. All of the above

32. The structure connecting the ovary to the uterus is the:

- A. Fallopian tube
- B. Broad ligament
- C. Round ligament
- D. Urethra

33. Which imaging modality is best for female pelvis evaluation?

- A. CT
- B. MRI
- C. Ultrasound
- D. X-ray

34. Hysterosalpingography (HSG) is used to evaluate:

- A. Urinary bladder
- B. Uterine cavity and fallopian tubes
- C. Renal pelvis
- D. Cervix

35. The hormone maintaining pregnancy:

- A. Estrogen
 - B. LH
 - C. Progesterone
 - D. FSH
-

36. Pap smear screens for:

- A. Endometrial cancer
- B. Ovarian cysts
- C. Cervical cancer
- D. Vaginal infection

37. The placenta normally attaches to:

- A. Cervix
- B. Uterine wall
- C. Fallopian tube
- D. Ovary

38. The testis is surrounded by:

- A. Epididymis
- B. Tunica vaginalis
- C. Dartos
- D. Prostate

39. The clitoris is homologous to the:

- A. Ovary
- B. Testis
- C. Penis
- D. Urethra

40. A bicornuate uterus is a:

- A. Malignant tumor
- B. Congenital uterine anomaly
- C. Fibroid
- D. Hormonal disorder

41. The hormone detected in pregnancy tests:

- A. LH
- B. HCG
- C. Estrogen
- D. Progesterone

42. The major artery supplying the uterus:

- A. Femoral artery
- B. Internal iliac artery
- C. Renal artery
- D. External iliac artery

43. Testicular torsion is best evaluated by:

- A. MRI
- B. CT
- C. Ultrasound with Doppler
- D. X-ray

44. Which of the following is a sexually transmitted disease?

- A. Endometriosis
- B. PID
- C. Chlamydia
- D. PCOS

45. Which hormone stimulates milk production?

- A. Prolactin
- B. Oxytocin
- C. Estrogen
- D. LH

46. The narrowest part of the male urethra is:

- A. Membranous
- B. Prostatic
- C. Penile
- D. Bladder neck

47. The perineum is located:

- A. Between bladder and rectum
- B. Between pubic symphysis and anus
- C. Between anus and external genitalia
- D. Around kidneys

48. The structure that produces testosterone:

- A. Prostate
- B. Leydig cells
- C. Sertoli cells
- D. Epididymis

49. A varicocele is commonly seen in the:

- A. Left testicular vein
- B. Right spermatic cord
- C. Urethra
- D. Seminal vesicle

50. Transvaginal sonography provides:

- A. Poor resolution
- B. Better resolution for pelvic organs
- C. View of upper abdomen
- D. Data on lung fields

Answer Key with Explanations

1. ✓A – Nephron is the basic unit of the kidney.
2. ✓C – Filtration begins in glomerulus.
3. ✓C – Kidneys lie between T12 and L3.
4. ✓A – ADH increases water reabsorption.
5. ✓C – Ureter transports urine to bladder.
6. ✓C – Right kidney is lower due to liver.
7. ✓C – Medulla contains renal pyramids.
8. ✓B – CT is best for detecting stones.
9. ✓D – Ureter is not part of the nephron.
10. ✓D – Capsule is the kidney's outermost layer.
11. ✓C – Normal bladder capacity ~500 mL.
12. ✓C – Seminal vesicle is not traversed by urethra.
13. ✓C – Renal pelvis collects urine.
14. ✓B – Hilum is the entry/exit site of vessels and ureter.
15. ✓C – GFR is mainly regulated by BP.
16. ✓B – Horseshoe kidney is congenital fusion anomaly.
17. ✓B – Vesicoureteral junction is where ureter meets bladder.
18. ✓A – Female urethra ~4 cm.
19. ✓C – Creatinine = muscle metabolism waste.
20. ✓B – CT KUB is best for stone evaluation.
21. ✓B – FSH stimulates spermatogenesis.

22. ✓C – Seminiferous tubules produce sperm.
23. ✓C – Epididymis stores and matures sperm.
24. ✓B – Vas deferens carries sperm.
25. ✓D – Bladder does not produce semen.
26. ✓A – Ovaries are the female gonads.
27. ✓D – Fertilization occurs in fallopian tube.
28. ✓B – Endometrium is shed during menstruation.
29. ✓D – LH triggers ovulation.
30. ✓B – Normal uterus is anteverted.
31. ✓D – Menstrual cycle is regulated by all listed.
32. ✓A – Fallopian tubes connect ovaries to uterus.
33. ✓C – Ultrasound is first choice for pelvic imaging.
34. ✓B – HSG visualizes uterine cavity & tubes.
35. ✓C – Progesterone maintains pregnancy.
36. ✓C – Pap smear screens for cervical cancer.
37. ✓B – Placenta attaches to uterine wall.
38. ✓B – Tunica vaginalis surrounds testis.
39. ✓C – Clitoris = female homolog of penis.
40. ✓B – Bicornuate uterus is congenital anomaly.
41. ✓B – HCG is detected in pregnancy tests.
42. ✓B – Uterine artery is branch of internal iliac.
43. ✓C – US with Doppler evaluates torsion.
44. ✓C – Chlamydia is an STD.
45. ✓A – Prolactin stimulates milk production.
46. ✓A – Membranous urethra is narrowest part.
47. ✓C – Perineum is between anus and genitals.
48. ✓B – Leydig cells make testosterone.
49. ✓A – Varicocele is more common on left side.
50. ✓B – TVS gives high-res pelvic images.

Practice Set 5

Topics Covered: Endocrine System (Glands & Hormones) and Lymphatic System (Organs, Immunity, Drainage)

Total: 50 MCQs |

1. The "master gland" of the body is the:

- A. Thyroid gland
- B. Pituitary gland
- C. Hypothalamus
- D. Adrenal gland

2. Insulin is secreted by:

- A. Alpha cells of pancreas
- B. Beta cells of pancreas
- C. Adrenal cortex
- D. Liver

3. Which hormone regulates calcium levels in blood?

- A. Cortisol
- B. Insulin
- C. Parathyroid hormone
- D. Glucagon

4. The target organ for ADH is the:

- A. Heart
- B. Kidney
- C. Liver
- D. Brain

5. The gland located on top of the kidneys is:

- A. Pituitary
- B. Thyroid
- C. Adrenal
- D. Parathyroid

6. Oxytocin is produced by the:

- A. Posterior pituitary
- B. Hypothalamus
- C. Anterior pituitary
- D. Pineal gland

7. The hormone responsible for metabolism is:

- A. Estrogen
- B. Thyroxine (T4)
- C. Oxytocin
- D. ACTH

8. Excess growth hormone in adults leads to:

- A. Gigantism
- B. Acromegaly
- C. Dwarfism
- D. Cretinism

9. The pineal gland secretes:

- A. Thyroxine
- B. Insulin
- C. Melatonin
- D. Aldosterone

10. Cushing's syndrome is due to excess:

- A. Cortisol
 - B. Aldosterone
 - C. Insulin
 - D. Estrogen
-

11. The hormone secreted in response to stress is:

- A. Melatonin
- B. Insulin
- C. Cortisol
- D. Oxytocin

12. Which gland produces melatonin?

- A. Thyroid
- B. Pituitary
- C. Pineal
- D. Parathyroid

13. The thyroid gland is located:

- A. Behind the trachea
- B. In the chest
- C. In front of trachea
- D. Above the kidneys

14. The hormone that lowers blood glucose is:

- A. Glucagon
- B. Cortisol
- C. Insulin
- D. GH

15. The adrenal medulla secretes:

- A. Cortisol
 - B. Aldosterone
 - C. Epinephrine
 - D. TSH
-

16. Addison's disease results from:

- A. Excess cortisol
- B. Adrenal insufficiency
- C. Excess thyroid hormone
- D. Pituitary tumor

17. Diabetes insipidus is caused by deficiency of:

- A. Cortisol
- B. Insulin
- C. ADH
- D. Glucagon

18. Graves' disease is a disorder of the:

- A. Pancreas
- B. Adrenal gland
- C. Thyroid gland
- D. Pituitary gland

19. Goiter is enlargement of the:

- A. Adrenal gland
- B. Parathyroid
- C. Thyroid gland
- D. Thymus

20. Which hormone stimulates milk ejection?

- A. Prolactin
 - B. Oxytocin
 - C. Estrogen
 - D. LH
-

21. Lymph is similar to:

- A. Urine
- B. Blood
- C. Plasma
- D. CSF

22. Which organ filters and stores blood?

- A. Thymus
- B. Liver
- C. Spleen
- D. Lymph node

23. The thoracic duct drains lymph into the:

- A. Right subclavian vein
- B. Left subclavian vein
- C. Jugular vein
- D. Aorta

24. The main function of lymph nodes is to:

- A. Pump blood
- B. Filter lymph
- C. Produce insulin
- D. Carry oxygen

25. Which of the following is NOT a lymphatic organ?

- A. Spleen
 - B. Tonsils
 - C. Liver
 - D. Thymus
-

26. The right lymphatic duct drains:

- A. Entire body
- B. Right arm, head, and thorax
- C. Right leg only
- D. Left side only

27. The thymus is most active during:

- A. Infancy and childhood
- B. Old age
- C. Middle age
- D. Pregnancy

28. Peyer's patches are found in the:

- A. Colon
- B. Ileum
- C. Duodenum
- D. Spleen

29. Lymph flows due to:

- A. Heart contractions
- B. Skeletal muscle movement
- C. Lung pressure
- D. Arterial pulsation

30. Which cells are involved in antibody production?

- A. Macrophages
- B. B lymphocytes
- C. T lymphocytes
- D. Neutrophils

31. The spleen is located in the:

- A. Left upper quadrant
- B. Right lower quadrant
- C. Right upper quadrant
- D. Left lower quadrant

32. Which immunity is acquired through vaccines?

- A. Passive natural
- B. Active artificial
- C. Active natural
- D. Passive artificial

33. Which type of WBC is most abundant?

- A. Basophil
- B. Eosinophil
- C. Lymphocyte
- D. Neutrophil

34. Which of the following is an autoimmune disease?

- A. Tuberculosis
- B. SLE
- C. Hepatitis
- D. HIV

35. The protein that tags pathogens for destruction:

- A. Hemoglobin
- B. Albumin
- C. Antibody
- D. Enzyme

36. Tonsils are located in the:

- A. Nasopharynx
- B. Bronchi
- C. Stomach
- D. Colon

37. Helper T-cells are classified as:

- A. CD4+
- B. CD8+
- C. B-cells
- D. Macrophages

38. Inflammation is a part of:

- A. Adaptive immunity
- B. Passive immunity
- C. Innate immunity
- D. Specific defense

39. Immunoglobulin A (IgA) is found in:

- A. Blood
- B. Saliva and mucous
- C. Bone marrow
- D. Skin

40. The first line of immune defense is:

- A. T-cells
 - B. Antibodies
 - C. Skin and mucosa
 - D. Cytokines
-

41. Which cell directly kills infected cells?

- A. B-cells
- B. Helper T-cells
- C. Cytotoxic T-cells
- D. Macrophages

42. Edema occurs when:

- A. Blood pressure is high
- B. Protein intake is low
- C. Lymphatic drainage is blocked
- D. Sodium is low

43. NK cells are part of:

- A. Specific immunity
- B. Adaptive immunity
- C. Innate immunity
- D. Humoral immunity

44. HIV targets:

- A. B-cells
- B. CD4+ T-cells
- C. RBCs
- D. Macrophages

45. Which organ is involved in T-cell maturation?

- A. Bone marrow
 - B. Liver
 - C. Spleen
 - D. Thymus
-

46. The antigen-presenting cells include:

- A. B-cells
- B. Macrophages
- C. Dendritic cells
- D. All of the above

47. The lymphatic system helps in:

- A. Hormone production
- B. Blood filtration
- C. Fluid balance and immunity
- D. Protein synthesis

48. Which lymph node group drains the breast?

- A. Inguinal
- B. Cervical
- C. Axillary
- D. Submandibular

49. Active immunity is:

- A. Immediate but short-lived
- B. Long-lasting and memory forming
- C. Only through injection
- D. Absent in children

50. Artificial passive immunity involves:

- A. Vaccine
 - B. Antibody injection
 - C. Natural infection
 - D. Breast milk
-

Answer Key with Explanations:

1. ✓B – Pituitary is called the "master gland".
2. ✓B – Beta cells secrete insulin.
3. ✓C – PTH regulates blood calcium.
4. ✓B – ADH acts on kidney tubules.
5. ✓C – Adrenal glands sit atop kidneys.
6. ✓B – Oxytocin is produced in hypothalamus, stored in posterior pituitary.
7. ✓B – Thyroxine controls metabolism.
8. ✓B – Acromegaly = GH excess in adults.
9. ✓C – Melatonin is secreted by pineal gland.
10. ✓A – Cushing's = excess cortisol.
11. ✓C – Cortisol is the primary stress hormone.
12. ✓C – Pineal produces melatonin.
13. ✓C – Thyroid is in front of trachea.
14. ✓C – Insulin lowers blood sugar.
15. ✓C – Epinephrine is from adrenal medulla.
16. ✓B – Addison's = adrenal insufficiency.
17. ✓C – ADH deficiency causes diabetes insipidus.
18. ✓C – Graves' disease affects thyroid.
19. ✓C – Goiter = thyroid enlargement.
20. ✓B – Oxytocin = milk ejection.
21. ✓C – Lymph is plasma-like.
22. ✓C – Spleen filters and stores blood.
23. ✓B – Thoracic duct drains into left subclavian vein.
24. ✓B – Lymph nodes filter lymph.
25. ✓C – Liver is not lymphatic organ.
26. ✓B – Right lymphatic duct drains right upper quadrant.
27. ✓A – Thymus is active in early life.
28. ✓B – Peyer's patches are in ileum.
29. ✓B – Lymph is moved by skeletal muscle action.
30. ✓B – B-cells produce antibodies.
31. ✓A – Spleen lies in LUQ.
32. ✓B – Vaccines = active artificial immunity.
33. ✓D – Neutrophils are most abundant.
34. ✓B – SLE is autoimmune.
35. ✓C – Antibodies tag antigens.
36. ✓A – Tonsils are in nasopharynx.
37. ✓A – Helper T-cells = CD4+.

- 38. ✓C – Inflammation is innate immunity.
 - 39. ✓B – IgA is in mucosal secretions.
 - 40. ✓C – Skin/mucosa = 1st line defense.
 - 41. ✓C – Cytotoxic T-cells destroy infected cells.
 - 42. ✓C – Lymphatic blockage causes edema.
 - 43. ✓C – NK cells = innate immunity.
 - 44. ✓B – HIV attacks CD4+ T-cells.
 - 45. ✓D – Thymus is site of T-cell maturation.
 - 46. ✓D – APCs include B-cells, macrophages, dendritic cells.
 - 47. ✓C – Lymphatic system = fluid balance + immunity.
 - 48. ✓C – Axillary nodes drain breast.
 - 49. ✓B – Active immunity provides long-term protection.
 - 50. ✓B – Passive artificial = antibody injection.
-

Practice Set 6

Topics Covered: Skin & Integumentary System + Imaging Physics (X-ray, CT, MRI, Radiation)
Total: 50 MCQs |

1. The largest organ in the human body is the:

- A. Liver
- B. Brain
- C. Skin
- D. Lung

2. The outermost layer of the skin is the:

- A. Dermis
- B. Epidermis
- C. Hypodermis
- D. Subcutaneous

3. The pigment melanin is produced by:

- A. Keratinocytes
- B. Fibroblasts
- C. Melanocytes
- D. Langerhans cells

4. Sweat glands that respond to stress and puberty are:

- A. Eccrine
- B. Apocrine
- C. Sebaceous
- D. Ceruminous

5. The skin layer rich in blood vessels is the:

- A. Epidermis
 - B. Stratum corneum
 - C. Dermis
 - D. Hair follicle
-

6. Nails are composed of:

- A. Collagen
- B. Elastin
- C. Keratin
- D. Melanin

7. The main function of sebaceous glands is to:

- A. Produce sweat
- B. Sense temperature
- C. Secrete sebum
- D. Stimulate hair growth

8. A burn involving epidermis and part of dermis is:

- A. First-degree
- B. Second-degree
- C. Third-degree
- D. Superficial

9. Langerhans cells play a role in:

- A. Thermoregulation
- B. Immunity
- C. Pigmentation
- D. Hair growth

10. Which vitamin is synthesized in skin?

- A. A
 - B. B12
 - C. D
 - D. K
-

11. The skin layer responsible for fingerprint patterns is:

- A. Epidermis
- B. Dermal papillae
- C. Hypodermis
- D. Stratum lucidum

12. Which part of hair is actively growing?

- A. Shaft
- B. Root
- C. Bulb
- D. Cuticle

13. The major risk factor for melanoma is:

- A. Smoking
- B. Sun exposure
- C. Viral infection
- D. Obesity

14. The thickest skin is found on:

- A. Eyelid
- B. Forearm
- C. Palm
- D. Abdomen

15. The primary function of the epidermis is:

- A. Temperature control
 - B. Sensory reception
 - C. Protection
 - D. Excretion
-

16. In an X-ray tube, electrons are emitted by:

- A. Anode
- B. Cathode
- C. Target
- D. Filtration system

17. X-rays were discovered by:

- A. Curie
- B. Wilhelm Roentgen
- C. Edison
- D. Planck

18. The speed of electrons in an X-ray tube depends on:

- A. Tube current
- B. Filtration
- C. kVp
- D. mAs

19. The quality (penetration) of X-ray beam is primarily controlled by:

- A. mA
- B. kVp
- C. Exposure time
- D. Grid

20. A grid is used to:

- A. Increase magnification
- B. Reduce scatter radiation
- C. Filter primary beam
- D. Control contrast

21. ALARA principle stands for:

- A. As Limited As Reason Allows
- B. As Low As Reasonably Achievable
- C. As Low As Real Attenuation
- D. None of the above

22. What device stores X-ray image in CR?

- A. Flat panel detector
- B. CCD
- C. Photostimulable phosphor plate
- D. Photodiode

23. In fluoroscopy, image intensifier increases:

- A. Spatial resolution
- B. Contrast
- C. Brightness
- D. Exposure time

24. CT image contrast is determined by:

- A. Pixel size
- B. Window level and width
- C. Gantry tilt
- D. Matrix size

25. The unit of radiation dose absorbed is:

- A. Becquerel
- B. Sievert
- C. Gray
- D. Curie

26. MRI does NOT use:

- A. X-rays
- B. Radio waves
- C. Magnetic field
- D. Hydrogen nuclei

27. T1-weighted MRI shows fat as:

- A. Dark
- B. Bright
- C. Intermediate
- D. Invisible

28. The basic tissue used in MRI signal generation is:

- A. Calcium
- B. Hydrogen
- C. Iron
- D. Oxygen

29. The CT number (HU) of water is:

- A. 100
- B. 50
- C. 0
- D. -100

30. Collimation in X-ray helps to:

- A. Increase scatter
- B. Increase magnification
- C. Reduce patient dose
- D. Prolong exposure

31. Which X-ray interaction contributes most to image formation?

- A. Photoelectric effect
- B. Compton scatter
- C. Pair production
- D. Coherent scatter

32. The anode angle in X-ray tube affects:

- A. Resolution and heat capacity
- B. mA
- C. Filtration
- D. Focal spot motion

33. DICOM standard is used in:

- A. Image transfer and storage
- B. CT dose calculation
- C. MRI scanner calibration
- D. Hospital registration

34. A pixel is a:

- A. Volume element
- B. Picture element
- C. Energy unit
- D. Radiation dose

35. A voxel is a:

- A. 2D image
 - B. 3D data element
 - C. Grid spacing
 - D. Detector
-

36. The most radiosensitive organ is the:

- A. Liver
- B. Brain
- C. Bone marrow
- D. Muscle

37. Which has the highest spatial resolution?

- A. MRI
- B. CT
- C. Ultrasound
- D. Conventional radiography

38. Lead equivalent for protective apron is:

- A. 0.1 mm
- B. 0.25–0.5 mm
- C. 1.5 mm
- D. 2 mm

39. Which controls contrast in digital radiography?

- A. Window width
- B. mA
- C. Grid ratio
- D. SID

40. The photoelectric effect is more common with:

- A. High kVp
 - B. Low Z materials
 - C. Low kVp and high Z
 - D. No filtration
-

41. Increasing SID leads to:

- A. Higher magnification
- B. Less sharpness
- C. Lower patient dose
- D. Image blur

42. PACS stands for:

- A. Patient and Clinic System
- B. Picture Archiving and Communication System
- C. Physical Analysis Computer System
- D. Pixel Alignment Capture Software

43. The main advantage of digital radiography is:

- A. More radiation
- B. Lower resolution
- C. Better workflow and post-processing
- D. Less reproducibility

44. Thermoluminescent dosimeter (TLD) uses:

- A. Silver halide
- B. Barium sulfate
- C. Lithium fluoride
- D. Lead

45. CT uses:

- A. Sound waves
 - B. X-rays
 - C. Gamma rays
 - D. Neutrons
-

46. mAs controls:

- A. Beam energy
- B. Image contrast
- C. Image sharpness
- D. Quantity of X-rays

47. Which detector type is used in flat panel DR systems?

- A. CR cassette
- B. Ionization chamber
- C. Amorphous silicon
- D. Zinc selenide

48. A short scale of contrast has:

- A. Many grays
- B. Low contrast
- C. Few grays and high contrast
- D. Poor resolution

49. Scatter is reduced by:

- A. Increasing kVp
- B. Using a grid
- C. Large field size
- D. Thick patient

50. In CT, pitch is defined as:

- A. Rotation per time
- B. Table movement per rotation / slice thickness
- C. Gantry angle
- D. Focal spot shift

Answer Key with Explanations

1. ✓C – Skin is the largest organ.
2. ✓B – Epidermis is outermost.
3. ✓C – Melanocytes make melanin.
4. ✓B – Apocrine glands activate at puberty.
5. ✓C – Dermis is vascular.
6. ✓C – Nails = keratin.
7. ✓C – Sebaceous glands secrete sebum (oil).
8. ✓B – Second-degree = partial dermis.
9. ✓B – Langerhans = immune cells in skin.

10. ✓C – Vitamin D is synthesized in skin with sunlight.
 11. ✓B – Dermal papillae form fingerprints.
 12. ✓C – Hair bulb = growth zone.
 13. ✓B – UV exposure is main risk for melanoma.
 14. ✓C – Palm/sole = thickest skin.
 15. ✓C – Epidermis mainly protects.
 16. ✓B – Electrons emitted by heated cathode.
 17. ✓B – Roentgen discovered X-rays.
 18. ✓C – Electron speed depends on kVp.
 19. ✓B – kVp = beam quality.
 20. ✓B – Grid reduces scatter.
 21. ✓B – ALARA = As Low As Reasonably Achievable.
 22. ✓C – CR uses photostimulable phosphor plate.
 23. ✓C – Image intensifier improves brightness.
 24. ✓B – CT contrast = window width/level.
 25. ✓C – Gray is absorbed dose unit.
 26. ✓A – MRI does NOT use X-rays.
 27. ✓B – Fat is bright on T1.
 28. ✓B – MRI uses hydrogen nuclei.
 29. ✓C – HU of water = 0.
 30. ✓C – Collimation reduces dose/scatter.
 31. ✓A – Photoelectric contributes most to image contrast.
 32. ✓A – Anode angle impacts resolution and heat load.
 33. ✓A – DICOM handles image storage/transfer.
 34. ✓B – Pixel = picture element.
 35. ✓B – Voxel = 3D image volume.
 36. ✓C – Bone marrow is highly radiosensitive.
 37. ✓D – Plain radiographs have highest spatial resolution.
 38. ✓B – Lead aprons = 0.25–0.5 mm Pb.
 39. ✓A – Window width controls contrast.
 40. ✓C – Photoelectric occurs at low kVp and high Z.
 41. ✓C – Longer SID = less dose, better sharpness.
 42. ✓B – PACS = image archiving system.
 43. ✓C – DR offers better post-processing & workflow.
 44. ✓C – TLD = lithium fluoride.
 45. ✓B – CT uses X-rays.
 46. ✓D – mAs = quantity of X-rays.
 47. ✓C – Amorphous silicon used in DR detectors.
 48. ✓C – Short scale = few grays, high contrast.
 49. ✓B – Grid reduces scatter.
 50. ✓B – Pitch = table movement/slice thickness per rotation.
-

Practice Set 7

Topics Covered: Radiation Protection & Radiographic Positioning
Total: 50 MCQs |

1. Which of the following principles helps minimize radiation exposure?

- A. Inverse square law
- B. ALARA
- C. Collimation
- D. All of the above

2. The most effective method of radiation protection for radiographers is:

- A. Shielding
- B. Time
- C. Distance
- D. Monitoring

3. Lead aprons should have a minimum equivalence of:

- A. 0.1 mm Pb
- B. 0.25 mm Pb
- C. 0.5 mm Pb
- D. 1 mm Pb

4. The unit used to measure occupational dose is:

- A. Gray
- B. Becquerel
- C. Sievert
- D. Curie

5. Which personnel dosimeter is most accurate and reusable?

- A. Film badge
- B. TLD
- C. OSL
- D. Pocket dosimeter

6. The annual occupational dose limit for whole body exposure is:

- A. 1 mSv
- B. 20 mSv
- C. 50 mSv
- D. 100 mSv

7. Gonadal shielding is most important in:

- A. Chest X-ray
- B. Skull imaging
- C. Abdominal radiography
- D. Extremity imaging

8. Scatter radiation is best minimized by:

- A. Reducing kVp
- B. Increasing SID
- C. Using a grid
- D. Increasing mAs

9. Which part of the X-ray tube prevents leakage radiation?

- A. Filament
- B. Collimator
- C. Housing
- D. Cathode

10. In mobile radiography, the minimum safe distance is:

- A. 1 meter
- B. 3 feet
- C. 6 feet
- D. 10 feet

11. The lead equivalent for thyroid shield is:

- A. 0.25 mm
- B. 0.35 mm
- C. 0.5 mm
- D. 1.0 mm

12. Dose area product (DAP) reflects:

- A. Only entrance dose
- B. Total radiation to the patient
- C. Scatter dose
- D. Background dose

13. Pregnant workers should wear dosimeter:

- A. On waist
- B. Inside lead apron
- C. At collar level outside apron
- D. Over stomach

14. The greatest source of occupational exposure is:

- A. Leakage
- B. Scatter
- C. Primary beam
- D. Background

15. Most sensitive cell type to radiation is:

- A. Nerve
- B. Muscle
- C. Lymphocyte
- D. Cartilage

16. PA chest projection is preferred over AP because:

- A. Better inspiration
- B. Less heart magnification
- C. Lower dose
- D. All of the above

17. The CR for lateral chest radiograph is directed at:

- A. T4
- B. T6
- C. T7
- D. T10

18. Oblique view of cervical spine best visualizes:

- A. Spinous processes
- B. Intervertebral joints
- C. Facet joints
- D. Intervertebral foramina

19. Which position shows the right kidney parallel to IR?

- A. RPO
- B. LPO
- C. RAO
- D. Left lateral

20. The best position to demonstrate air-fluid levels is:

- A. Supine
- B. Prone
- C. Erect
- D. Decubitus

21. The CR for AP pelvis is directed:

- A. At umbilicus
- B. 2 inches below ASIS
- C. Iliac crest
- D. Symphysis pubis

22. For lateral knee radiograph, knee is flexed to:

- A. 10°
- B. 30°
- C. 90°
- D. 135°

23. The view best for evaluating sinusitis is:

- A. Townes view
- B. Waters view
- C. Caldwell view
- D. Lateral skull

24. The position for barium enema "air-contrast" study is:

- A. RAO
- B. Left lateral decubitus
- C. Erect
- D. Supine

25. The best view for sternum visualization is:

- A. AP
 - B. Lateral
 - C. RAO
 - D. PA
-

26. The “frog-leg” lateral projection is used for:

- A. Femur
- B. Pelvis
- C. Hip
- D. Knee

27. The standard SID for chest X-ray is:

- A. 40 inches
- B. 48 inches
- C. 60 inches
- D. 72 inches

28. To show open interphalangeal joints of fingers, the CR must be:

- A. Angled 10°
- B. Perpendicular
- C. Angled 15°
- D. Angled 30°

29. The view best for zygomatic arches is:

- A. Lateral skull
- B. Waters
- C. Submentovertex (SMV)
- D. Caldwell

30. The PA axial (Townes) view is used for:

- A. Sella turcica
 - B. Facial bones
 - C. Mandible
 - D. Occipital bone
-

31. The most common projection for lumbar spine is:

- A. AP
- B. PA
- C. Lateral
- D. Oblique

32. The best projection for left lung pathology is:

- A. Right lateral
- B. Left lateral
- C. PA erect
- D. Supine

33. For AP sacrum, the CR angle is:

- A. 0°
- B. 10° cephalad
- C. 15° caudad
- D. 30° cephalad

34. The intercondylar fossa is best seen in:

- A. AP knee
- B. Lateral knee
- C. Axial (tunnel) view
- D. Oblique knee

35. Axial projection of shoulder shows:

- A. Scapular spine
 - B. Coracoid process
 - C. Glenoid cavity
 - D. Acromioclavicular joint
-

36. PA axial view of skull is also called:

- A. Townes view
- B. Waters view
- C. Caldwell view
- D. SMV view

37. Modified Cleaves method is used for:

- A. Pelvis
- B. Hip
- C. Cervical spine
- D. Sacrum

38. Ankle mortise is best shown in:

- A. AP view
- B. Oblique (15–20°)
- C. Lateral view
- D. Weight-bearing view

39. AP axial cervical spine (C3–C7) requires CR angle of:

- A. 0°
- B. 10° cephalad
- C. 15–20° cephalad
- D. 30° caudad

40. For SI joints, CR angle is:

- A. 0°
- B. 10° cephalad
- C. 30° cephalad
- D. 15–20° cephalad

41. Swimmer's view demonstrates:

- A. Thoracic spine
- B. Cervicothoracic junction
- C. C1–C2
- D. Lumbosacral junction

42. Lateral decubitus chest is useful to show:

- A. Heart size
- B. Pleural effusion
- C. Rib fracture
- D. Tracheal shift

43. RAO sternum is preferred over LAO because:

- A. Magnification
- B. Sternum superimposed on heart
- C. Rotation error
- D. Easier patient position

44. For lateral nasal bone, CR is directed:

- A. 1 cm anterior to EAM
- B. ½ inch below nasion
- C. Perpendicular to nasion
- D. Midway between orbits

45. Which projection evaluates the odontoid (dens)?

- A. AP cervical
- B. Lateral cervical
- C. Open mouth view
- D. Fuchs method

46. The preferred position to evaluate scoliosis:

- A. PA erect
- B. Supine
- C. Prone
- D. Right lateral

47. Best position for foreign body in trachea:

- A. AP
- B. Lateral neck
- C. Oblique
- D. Erect abdomen

48. Which view best shows posterior ribs?

- A. AP
- B. PA
- C. Oblique
- D. Lateral

49. The scapular Y-view is useful for:

- A. Shoulder dislocation
- B. Clavicle fracture
- C. AC joint evaluation
- D. Humerus fracture

50. In IVU, the nephrogram phase is captured at:

- A. 5 min
- B. 15 min
- C. Immediately after injection
- D. 30 min

Answer Key with Explanations:

1. ✓D – All techniques reduce dose.
2. ✓C – Distance is most effective.
3. ✓C – Lead aprons: ≥ 0.5 mm Pb.
4. ✓C – Sievert = occupational dose.
5. ✓B – TLD is accurate & reusable.
6. ✓C – Whole-body limit: 50 mSv/year.
7. ✓C – Gonads near beam in abdomen.
8. ✓C – Grid reduces scatter.
9. ✓C – Housing shields leakage.
10. ✓C – Stay at least 6 feet away.
11. ✓C – Thyroid shields are 0.5 mm Pb.
12. ✓B – DAP = total dose delivered.
13. ✓C – Collar outside lead apron.
14. ✓B – Scatter is major occupational risk.
15. ✓C – Lymphocytes are most radiosensitive.
16. ✓D – PA reduces dose & magnification.
17. ✓C – Chest CR: T7 (mid-scapula).
18. ✓D – Obliques show foramina.
19. ✓A – RPO aligns right kidney with IR.
20. ✓C – Erect best shows levels.
21. ✓B – Pelvis CR: 2" below ASIS.
22. ✓B – 30° flexion opens joint.
23. ✓B – Waters = maxillary sinuses.

24. ✓B – Left decubitus = air-fluid level.
25. ✓C – RAO best separates sternum.
26. ✓C – Frog-leg = hip projection.
27. ✓D – Chest = 72" SID.
28. ✓B – CR must be perpendicular.
29. ✓C – SMV shows zygomatic arches.
30. ✓D – Townes = occipital bone.
31. ✓A – Lumbar series starts with AP.
32. ✓B – Left lateral shows left lung.
33. ✓B – AP sacrum = 10–15° cephalad.
34. ✓C – Tunnel view shows intercondylar fossa.
35. ✓C – Axial shoulder shows glenoid.
36. ✓C – Caldwell = PA skull with angle.
37. ✓B – Modified Cleaves = hip/pelvis.
38. ✓B – Oblique opens mortise space.
39. ✓C – Cervical AP: 15–20° cephalad.
40. ✓D – SI joint: 15–20° cephalad.
41. ✓B – Swimmer's = C-T junction.
42. ✓B – Decubitus chest = fluid levels.
43. ✓B – Sternum over heart = better contrast.
44. ✓B – CR ½" below nasion.
45. ✓C – Open mouth = odontoid view.
46. ✓A – Scoliosis series = PA erect.
47. ✓B – Lateral neck shows trachea.
48. ✓A – AP shows posterior ribs.
49. ✓A – Scapular Y shows dislocation.
50. ✓C – Nephrogram = immediate post-injection.

Practice Set 8

Topics Covered: PACS, RIS, and Quality Assurance in Radiography

Total: 50 MCQs |

1. PACS stands for:

- A. Patient Access and Care System
- B. Picture Archiving and Communication System
- C. Pixel Allocation and Capture Storage
- D. Program for Archiving Clinical Scans

2. RIS stands for:

- A. Radiographic Imaging Standard
- B. Radiology Information System
- C. Radiation Integrated Software
- D. Remote Imaging Storage

3. Which of the following is a primary function of PACS?

- A. Staff scheduling
- B. Dose calculation
- C. Image storage and retrieval
- D. Equipment calibration

4. DICOM ensures:

- A. Network encryption
- B. Patient confidentiality
- C. Interoperability of medical imaging systems
- D. Data compression

5. The database in PACS stores:

- A. Raw image data
- B. Compressed images only
- C. Only patient reports
- D. Images and associated data

6. HL7 protocol is used for:

- A. MRI sequences
- B. Ultrasound formatting
- C. Exchanging health information
- D. Compression of image files

7. One of the advantages of PACS is:

- A. Increased radiation
- B. Slow retrieval time
- C. Remote access to images
- D. Less availability

8. Which modality integrates most efficiently with PACS?

- A. CR only
- B. CT, MRI, and DR
- C. Ultrasound only
- D. PET only

9. RIS is mainly used for:

- A. Image reconstruction
- B. Report generation and workflow management
- C. Dose measurement
- D. Patient oxygen monitoring

10. Which of the following best defines teleradiology?

- A. Digital photography of radiographs
- B. Image printing and filing
- C. Transmission of radiological images remotely
- D. Live ultrasound streaming

11. Which of the following is a benefit of digital imaging systems?

- A. Need for chemical processing
- B. Loss of data
- C. Enhanced image manipulation
- D. Longer turnaround time

12. The standard format used for medical imaging is:

- A. PNG
- B. JPEG
- C. DICOM
- D. BMP

13. PACS helps in:

- A. Maintaining darkroom conditions
- B. Enhancing radiation scatter
- C. Workflow efficiency
- D. Manual record-keeping

14. Which of these is an example of PACS workstation use?

- A. Ultrasound scanning
- B. Image interpretation
- C. Patient transport
- D. Radiation shielding

15. Which system is useful in scheduling appointments and billing?

- A. PACS
 - B. RIS
 - C. CT
 - D. QA
-

16. In PACS architecture, the term “archive server” refers to:

- A. Processing unit
- B. Viewing console
- C. Long-term image storage
- D. Patient registration

17. In quality assurance, the main goal is:

- A. Increasing image contrast
- B. Reducing staff
- C. Ensuring optimal image quality and patient safety
- D. Replacing radiologists

18. Which of the following is NOT part of QA in radiography?

- A. Regular equipment calibration
- B. Patient identity verification
- C. Protocol standardization
- D. Ignoring exposure settings

19. Spatial resolution can be tested using:

- A. Step wedge
- B. Line pair phantom
- C. DAP meter
- D. Grid ratio

20. A high reject/repeat rate indicates:

- A. Excellent image quality
 - B. Underexposure
 - C. QA issues or training needs
 - D. Normal workflow
-

21. Quality control (QC) is a part of:

- A. PACS
- B. Quality Assurance
- C. RIS
- D. Radiation dose index

22. Daily QC checks include:

- A. Weekly backup
- B. Visual inspection of monitors
- C. Preventive maintenance
- D. Vendor feedback

23. AEC helps by:

- A. Increasing resolution
- B. Decreasing patient dose by optimizing exposure
- C. Improving contrast
- D. Providing CT image slices

24. Which of the following evaluates film density and contrast?

- A. Step wedge
- B. DICOM tag
- C. PACS log
- D. Pixel counter

25. QA documentation includes all EXCEPT:

- A. Exposure logs
 - B. Maintenance records
 - C. Technician sleep hours
 - D. Reject analysis
-

26. Calibration ensures:

- A. Correct patient positioning
- B. Accurate and consistent equipment performance
- C. Reduced room size
- D. Longer scan times

27. Who is primarily responsible for implementing QA programs?

- A. Patient
- B. Radiographer
- C. Hospital cleaner
- D. Clerk

28. Repeat analysis involves:

- A. Repeating patient history
- B. Tracking causes of repeated images
- C. Image sharpening
- D. System shutdown

29. Which device measures radiation output?

- A. Photodiode
- B. Ionization chamber
- C. CR cassette
- D. CPU

30. Leakage radiation must not exceed:

- A. 10 mGy/hour
- B. 0.5 mGy/hour
- C. 1 mGy/hour
- D. 2 mGy/hour

31. Optical density is measured using a:

- A. Pixel analyzer
- B. Densitometer
- C. Grid
- D. Phantom

32. Daily sensitometry check in film-based QA monitors:

- A. Density control
- B. Developer temperature
- C. Replenishment system
- D. All of the above

33. Which tool measures light intensity of viewboxes?

- A. Lux meter
- B. Step wedge
- C. Caliper
- D. Grid

34. Phantom image test evaluates:

- A. Contrast
- B. Resolution
- C. Noise
- D. All of the above

35. A QC test for DR flat-panel detectors includes:

- A. Grid alignment
- B. Detector uniformity
- C. Focal spot test
- D. Collimation

36. SMPTE pattern is used to test:

- A. Monitor display quality
- B. Radiation leakage
- C. Table alignment
- D. Detector thickness

37. The exposure chart is used for:

- A. Selecting scanning sequence
- B. Determining exposure parameters for specific exams
- C. Avoiding patient ID errors
- D. Evaluating contrast agent

38. QA cycle includes:

- A. Plan, Do, Check, Act
- B. Write, Post, View
- C. Read, Scan, Save
- D. Register, Analyze, Archive

39. A repeat rate higher than 10% may indicate:

- A. Patient fault
- B. Technologist training issue
- C. Excellent QA
- D. Calibration success

40. Viewbox brightness should be:

- A. $\leq 1000 \text{ cd/m}^2$
- B. $\geq 1500 \text{ cd/m}^2$
- C. $250\text{--}500 \text{ cd/m}^2$
- D. $\geq 3000 \text{ cd/m}^2$

41. QA improves:

- A. Patient dose
- B. Workflow
- C. Image quality
- D. All of the above

42. The primary advantage of digital QC systems is:

- A. Increased processing time
- B. Error-prone calculations
- C. Automation and data tracking
- D. Use of chemical films

43. Most QC issues in DR are due to:

- A. System software
- B. Radiologist
- C. Electrical noise
- D. Exposure technique errors

44. Equipment warm-up is part of:

- A. Monthly QA
- B. Weekly QA
- C. Daily QA
- D. Annual QA

45. Who accredits radiology departments for QA in many countries?

- A. CDC
 - B. AERB
 - C. JCI / ACR
 - D. WHO
-

46. PACS servers must be backed up:

- A. Weekly
- B. Monthly
- C. Annually
- D. Hourly

47. Reject analysis helps:

- A. Improve patient care
- B. Identify equipment faults
- C. Identify technologist errors
- D. All of the above

48. CT phantom testing ensures:

- A. Magnetic field strength
- B. Beam collimation
- C. CT number accuracy and spatial resolution
- D. PACS security

49. Ghost image artifact in CR is due to:

- A. Low exposure
- B. Over-processing
- C. Incomplete plate erasure
- D. Excessive SID

50. The primary goal of quality control is to:

- A. Increase workload
 - B. Ensure consistent image quality
 - C. Increase cost
 - D. Decrease radiation physics
-

Answer Key with Explanations

1. ✓B – PACS: Picture Archiving and Communication System
2. ✓B – RIS = Radiology Information System
3. ✓C – PACS stores and retrieves images
4. ✓C – DICOM ensures compatibility
5. ✓D – PACS includes images + metadata
6. ✓C – HL7 handles patient/clinical data
7. ✓C – Remote access is a key benefit
8. ✓B – CT, MRI, DR fully integrate with PACS
9. ✓B – RIS manages workflow & reports
10. ✓C – Teleradiology = remote image transfer
11. ✓C – Digital allows image manipulation
12. ✓C – DICOM is the imaging standard
13. ✓C – PACS boosts efficiency
14. ✓B – Workstation is for viewing/interpreting images
15. ✓B – RIS handles scheduling and billing
16. ✓C – Archive server = long-term image storage
17. ✓C – QA ensures safety and quality
18. ✓D – Ignoring settings = QA failure
19. ✓B – Line-pair phantom = resolution test
20. ✓C – High repeats show system/training issues
21. ✓B – QC is part of QA
22. ✓B – Daily checks include monitor function
23. ✓B – AEC reduces exposure variability
24. ✓A – Step wedge = contrast/density check
25. ✓C – Technician sleep isn't QA data
26. ✓B – Calibration = consistent function
27. ✓B – Radiographers implement QA programs
28. ✓B – Repeat analysis identifies imaging errors
29. ✓B – Ion chamber = dose measurement
30. ✓C – Leakage <1 mGy/hr
31. ✓B – Densitometer measures optical density
32. ✓D – Sensitometry = total processor health
33. ✓A – Lux meter = viewbox brightness
34. ✓D – Phantom test = resolution, contrast, noise
35. ✓B – Uniformity is tested in DR panels
36. ✓A – SMPTE = monitor QC
37. ✓B – Exposure chart guides technique

- 38. ✓A – QA = Plan-Do-Check-Act cycle
- 39. ✓B – High repeat rate suggests training needs
- 40. ✓B – Viewbox: ≥ 1500 cd/m² brightness
- 41. ✓D – QA boosts dose safety + workflow
- 42. ✓C – Digital QC enables automation
- 43. ✓D – Exposure errors are common QC issue
- 44. ✓C – Equipment warm-up = daily QA
- 45. ✓C – ACR or JCI accredit radiology QA
- 46. ✓A – Backups usually done weekly
- 47. ✓D – Reject analysis improves all aspects
- 48. ✓C – CT phantom = HU accuracy/resolution
- 49. ✓C – Ghosts = incomplete erasure
- 50. ✓B – QC ensures consistent diagnostic image quality

Practice Set 9

Topics Covered: Emergency Radiography & Interventional Radiology
Total: 50 MCQs |

1. In trauma settings, the first radiograph usually performed is:

- A. Chest X-ray
- B. Skull X-ray
- C. Pelvis X-ray
- D. Lateral cervical spine

2. The most sensitive imaging modality for head trauma is:

- A. MRI
- B. CT
- C. X-ray
- D. Ultrasound

3. A FAST scan in trauma is used to detect:

- A. Bone fractures
- B. Brain bleed
- C. Internal bleeding
- D. Lung collapse

4. The radiographic view best to rule out pneumothorax:

- A. Supine AP chest
- B. Erect PA chest
- C. Lateral decubitus
- D. Lateral cervical spine

5. Which of the following is NOT part of trauma imaging protocol?

- A. Lateral C-spine
 - B. Chest AP
 - C. Pelvis AP
 - D. Skull PA
-

6. The golden rule of trauma radiography is:

- A. Finish quickly
- B. Do not move patient
- C. Protect staff
- D. Image all body parts

7. Most common site of spinal trauma is:

- A. Cervical spine
- B. Thoracic spine
- C. Lumbar spine
- D. Sacrum

8. Jefferson fracture involves which part of spine?

- A. C1
- B. C2
- C. T1
- D. L5

9. A burst fracture of C2 is known as:

- A. Hangman's fracture
- B. Clay-shoveler fracture
- C. Teardrop fracture
- D. Jefferson fracture

10. An air-fluid level in upright abdominal X-ray suggests:

- A. Constipation
 - B. Pneumoperitoneum
 - C. Bowel obstruction
 - D. Ascites
-

11. Which imaging is best to detect free air under diaphragm?

- A. Upright chest X-ray
- B. Supine abdomen
- C. Prone abdomen
- D. Decubitus chest

12. A widened mediastinum on trauma chest X-ray may indicate:

- A. Hemothorax
- B. Aortic injury
- C. Cardiac tamponade
- D. Pneumothorax

13. The best initial imaging for suspected hemothorax:

- A. Erect chest X-ray
- B. Lateral decubitus
- C. CT thorax
- D. Ultrasound

14. A fracture with multiple bone fragments is called:

- A. Greenstick
- B. Spiral
- C. Comminuted
- D. Simple

15. Most common long bone fracture in adults:

- A. Femur
 - B. Tibia
 - C. Radius
 - D. Clavicle
-

16. In trauma, AP pelvis X-ray is done to detect:

- A. Kidney injury
- B. Pelvic fracture
- C. Intestinal obstruction
- D. Bladder rupture

17. Subdural hematoma is best evaluated with:

- A. Ultrasound
- B. CT head
- C. MRI spine
- D. Skull X-ray

18. A tension pneumothorax is a:

- A. Medical emergency
- B. Chronic lung condition
- C. Heart disease
- D. Rib fracture

19. Which contrast agent is safest in renal trauma?

- A. Gadolinium
- B. High-osmolar iodine
- C. Low-osmolar nonionic iodine
- D. Barium

20. The “spinnaker sail” sign on neonatal chest X-ray indicates:

- A. Diaphragmatic hernia
- B. Pneumomediastinum
- C. Atelectasis
- D. Pleural effusion

21. Interventional radiology uses:

- A. Surgical incision
- B. Endoscopy
- C. Imaging-guided minimally invasive techniques
- D. Radiation therapy

22. The most common vascular access site in IR is:

- A. Subclavian artery
- B. Brachial vein
- C. Femoral artery
- D. Jugular vein

23. Angiography is used to evaluate:

- A. Bones
- B. Soft tissues
- C. Blood vessels
- D. Airways

24. Which modality is most commonly used in vascular IR?

- A. MRI
- B. CT
- C. Fluoroscopy
- D. PET

25. Embolization is used to:

- A. Enlarge blood vessels
- B. Detect aneurysm
- C. Block abnormal blood flow
- D. Restore organ function

26. Which of the following is NOT a common IR procedure?

- A. Biopsy
- B. Angioplasty
- C. Stent placement
- D. Craniotomy

27. The imaging modality used during PICC line insertion:

- A. MRI
- B. Ultrasound
- C. CT
- D. PET

28. Uterine fibroid embolization is used to:

- A. Destroy fibroids surgically
- B. Shrink fibroids by reducing blood supply
- C. Enhance fertility
- D. Remove the uterus

29. Which needle is preferred for percutaneous biopsy?

- A. Blunt tip
- B. Hollow-core
- C. Bone marrow
- D. Hypodermic

30. Drainage of abscess under US or CT is called:

- A. Cystectomy
- B. Nephrectomy
- C. Percutaneous drainage
- D. Laparoscopy

31. Which guidewire property is most important?

- A. Flexibility
- B. Radio-opacity
- C. Rigidity
- D. Coating

32. The “road mapping” technique is used in:

- A. CT
- B. Angiography
- C. Ultrasound
- D. Radiography

33. A stent is used in IR to:

- A. Block a vessel
- B. Open a blocked vessel
- C. Cut tissue
- D. Remove tumors

34. A major risk of angiography is:

- A. Rash
- B. Kidney stones
- C. Bleeding and embolism
- D. Osteoporosis

35. IVC filter is placed to:

- A. Increase renal perfusion
 - B. Prevent pulmonary embolism
 - C. Stop bleeding in GI tract
 - D. Replace heart valves
-

36. Interventional procedures are commonly performed in:

- A. Operating room
- B. CT suite
- C. Interventional lab (angio suite)
- D. Ward

37. Fluoroscopy is mainly used in IR because:

- A. It is non-ionizing
- B. Provides real-time imaging
- C. Does not require contrast
- D. Uses ultrasound waves

38. Thrombolysis is the process of:

- A. Blocking vessels
- B. Stent deployment
- C. Breaking down clots
- D. Occluding aneurysms

39. Image-guided biopsy reduces:

- A. Radiation dose
- B. Patient preparation
- C. Complications and increases accuracy
- D. Treatment duration

40. Most common post-biopsy complication:

- A. Infection
 - B. Bleeding
 - C. Pain
 - D. Fever
-

41. Coaxial needle system improves:

- A. Anesthesia delivery
- B. Multiple sampling via one puncture
- C. Radiation protection
- D. Skin healing

42. Catheter selection in IR depends on:

- A. Patient age only
- B. Vessel size and procedure type
- C. Skin color
- D. Patient gender

43. Hepatic chemoembolization delivers drugs:

- A. Systemically
- B. Directly into portal vein
- C. Directly into hepatic artery feeding tumor
- D. Orally

44. Portacath is used for:

- A. Feeding tube
- B. Long-term venous access
- C. Dialysis
- D. Blood pressure measurement

45. Which imaging is used during vertebroplasty?

- A. Ultrasound
 - B. MRI
 - C. Fluoroscopy
 - D. X-ray
-

46. Angioplasty balloon inflation is guided by:

- A. MRI
- B. Ultrasound
- C. Fluoroscopy
- D. CT

47. Which catheter type is commonly used in cerebral angiography?

- A. Foley catheter
- B. Pigtail catheter
- C. Judkins catheter
- D. Simmons catheter

48. Biliary drainage is needed in:

- A. Renal cyst
- B. Obstructive jaundice
- C. Pneumonia
- D. Appendicitis

49. In IR, Seldinger technique refers to:

- A. Surgical cutdown
- B. Guidewire technique for vascular access
- C. Fluoroscopy adjustment
- D. Anesthesia delivery method

50. Commonly used contrast agent in IR:

- A. Barium sulfate
- B. Iodinated non-ionic contrast
- C. Gadolinium
- D. Saline

Answer Key with Explanations

1. ✓A – Chest X-ray is quick and essential in trauma
2. ✓B – CT is fastest and best for acute brain injuries
3. ✓C – FAST detects internal bleeding
4. ✓B – Erect chest best shows air (pneumothorax)
5. ✓D – Skull PA is not routine in trauma protocol
6. ✓B – Minimal movement is key in trauma
7. ✓A – Cervical spine is most frequently injured
8. ✓A – Jefferson fracture affects atlas (C1)
9. ✓A – Hangman's = C2 pedicle fracture

10. ✓C – Air-fluid levels indicate obstruction
 11. ✓A – Upright chest shows free subdiaphragmatic air
 12. ✓B – Widened mediastinum suggests aortic trauma
 13. ✓A – Chest X-ray shows pleural fluid levels
 14. ✓C – Comminuted = multiple fragments
 15. ✓D – Clavicle fracture is most common
 16. ✓B – AP pelvis rules out pelvic fracture
 17. ✓B – CT is ideal for subdural hematoma
 18. ✓A – Tension pneumothorax is life-threatening
 19. ✓C – Low-osmolar contrast is safest in renal patients
 20. ✓B – Spinnaker sail = pneumomediastinum
 21. ✓C – IR uses image-guided, minimally invasive techniques
 22. ✓C – Femoral artery is standard access site
 23. ✓C – Angiography assesses blood vessels
 24. ✓C – IR uses fluoroscopic guidance
 25. ✓C – Embolization blocks abnormal flow
 26. ✓D – Craniotomy is not IR; it's surgical
 27. ✓B – PICC placement uses US
 28. ✓B – UFE shrinks fibroids via blood supply reduction
 29. ✓B – Hollow-core needle for tissue sampling
 30. ✓C – Image-guided abscess drainage = percutaneous
 31. ✓B – Radiopaque wires are trackable
 32. ✓B – Road mapping = vascular guidance in angio
 33. ✓B – Stents open up narrowed vessels
 34. ✓C – Bleeding/embolism are angio risks
 35. ✓B – IVC filter prevents embolism to lungs
 36. ✓C – IR procedures are done in angio suite
 37. ✓B – Fluoro provides real-time imaging
 38. ✓C – Thrombolysis dissolves clots
 39. ✓C – IG biopsy improves safety and accuracy
 40. ✓B – Bleeding is most frequent issue post-biopsy
 41. ✓B – Coaxial = multiple samples from single site
 42. ✓B – Catheter size/type is procedure-dependent
 43. ✓C – Chemoembolization targets hepatic tumors
 44. ✓B – Portacath provides long-term access
 45. ✓C – Vertebroplasty uses real-time fluoro
 46. ✓C – Fluoro guides balloon angioplasty
 47. ✓D – Simmons catheter in neuro-angiography
 48. ✓B – Obstructed bile ducts need drainage
 49. ✓B – Seldinger technique = guidewire access
 50. ✓B – Non-ionic iodinated contrast used in IR
-

Practice Set 10

Topics Covered: Cross-Sectional Imaging – CT & MRI (Principles, Anatomy, Applications, Safety)

Total: 50 MCQs |

1. The primary imaging plane used in CT is:

- A. Coronal
- B. Sagittal
- C. Axial
- D. Oblique

2. In MRI, the most abundant atom utilized is:

- A. Oxygen
- B. Hydrogen
- C. Carbon
- D. Sodium

3. Hounsfield Unit (HU) of air is:

- A. 0
- B. -1000
- C. +1000
- D. -500

4. MRI is contraindicated in patients with:

- A. Dental fillings
- B. Hip prosthesis
- C. Pacemakers
- D. Tattoos

5. CT is more sensitive than MRI for:

- A. Brain tumors
 - B. Bone fractures
 - C. Ligament injuries
 - D. Soft tissue masses
-

6. T1-weighted MRI shows fat as:

- A. Dark
- B. Bright
- C. Gray
- D. Absent

7. The gantry in CT refers to:

- A. Contrast injector
- B. Patient bed
- C. Rotating frame with X-ray tube and detectors
- D. Monitor workstation

8. The most commonly used MRI contrast agent is:

- A. Iodine
- B. Gadolinium
- C. Barium
- D. Technetium

9. The pitch in helical CT determines:

- A. Image matrix
- B. Patient radiation dose
- C. Contrast type
- D. Coil strength

10. CT is preferred over MRI in:

- A. Brain edema
- B. Herniated disc
- C. Pulmonary embolism
- D. ACL tear

11. MRI uses which type of radiation?

- A. Gamma rays
- B. X-rays
- C. Radiofrequency
- D. Beta particles

12. CT contrast reactions are most commonly:

- A. Anaphylactic
- B. Nephrotoxic
- C. Mild and self-limiting
- D. Fatal

13. An MRI T2 image shows fluid as:

- A. Black
- B. Bright
- C. Gray
- D. Invisible

14. The magnetic field strength in clinical MRI is measured in:

- A. Tesla
- B. Gray
- C. Sievert
- D. Volt

15. MRI signal originates from:

- A. Radioactive decay
- B. Nuclear fission
- C. Spinning protons in hydrogen nuclei
- D. CT detectors

16. Window width in CT controls:

- A. Image brightness
- B. Contrast
- C. Field of view
- D. Detector speed

17. The HU of water is:

- A. -100
- B. 0
- C. +100
- D. +1000

18. Multislice CT allows:

- A. Faster scan and 3D reconstructions
- B. Less image clarity
- C. Lower resolution
- D. Only single slice per rotation

19. MRI safe zones are labeled as:

- A. Zones A to D
- B. Zones 1 to 4
- C. Areas X to Z
- D. Red, Yellow, Green

20. Which sequence is best for detecting edema in MRI?

- A. T1
- B. T2
- C. Gradient echo
- D. Diffusion

21. Which CT parameter most affects patient dose?

- A. Pitch
- B. Slice thickness
- C. Window level
- D. Gantry tilt

22. Which of the following is NOT a typical MRI contraindication?

- A. Cochlear implant
- B. Orthopedic screw
- C. Intracranial aneurysm clip
- D. Metallic shrapnel

23. The CT artifact caused by metal is:

- A. Ring artifact
- B. Streak artifact
- C. Motion artifact
- D. Beam hardening

24. Gadolinium contrast is eliminated by:

- A. Liver
- B. Sweat
- C. Kidney
- D. Lungs

25. The CT number for fat is approximately:

- A. -100
 - B. 0
 - C. +50
 - D. -500
-

26. In MRI, TR and TE refer to:

- A. Image resolution settings
- B. Timing parameters of pulse sequences
- C. Contrast agents
- D. Patient instructions

27. The slice thickness in CT is determined by:

- A. Matrix size
- B. Collimation
- C. kVp
- D. Field of view

28. MRI scanner room is shielded to block:

- A. Gamma radiation
- B. Sound waves
- C. Electromagnetic interference (RF)
- D. Heat loss

29. The typical field strength of a standard clinical MRI is:

- A. 0.5 Tesla
- B. 1.5 Tesla
- C. 3 Tesla
- D. Both B and C

30. MRI signal-to-noise ratio improves with:

- A. Lower field strength
 - B. Smaller coils
 - C. Higher field strength
 - D. Patient motion
-

31. The rotating anode is present in:

- A. MRI
- B. X-ray and CT
- C. PET
- D. Ultrasound

32. T2-weighted MRI is useful in detecting:

- A. Fatty liver
- B. Brain hemorrhage
- C. Soft tissue edema
- D. Bone lesions

33. CT angiography visualizes:

- A. Airways
- B. Blood vessels
- C. GI tract
- D. Ligaments

34. Diffusion-weighted imaging (DWI) is used in:

- A. Kidney tumors
- B. Acute stroke
- C. Bone scan
- D. Pelvic fracture

35. FLAIR sequence suppresses:

- A. Fat
 - B. CSF
 - C. Gray matter
 - D. Bone
-

36. CT scanning uses which type of radiation?

- A. Ultrasound
- B. Radiofrequency
- C. X-rays
- D. Gamma rays

37. Artifacts in MRI can be reduced by:

- A. Using lead shield
- B. Increasing FOV
- C. Asking patient to hold breath
- D. Increasing mAs

38. The voxel size in CT is influenced by:

- A. FOV, matrix, and slice thickness
- B. TR and TE
- C. Gantry speed
- D. Detector rotation

39. CT detectors convert:

- A. X-rays to sound
- B. X-rays to electrical signal
- C. RF waves to X-rays
- D. Motion to brightness

40. MRI safety screening includes checking for:

- A. Tattoos
- B. Piercings
- C. Implants
- D. All of the above

41. The most common indication for CT head in emergency:

- A. Seizure
- B. Brain tumor
- C. Headache
- D. Trauma

42. In MRI, the image plane perpendicular to axial is:

- A. Coronal
- B. Sagittal
- C. Oblique
- D. Axial

43. High signal intensity on T2 means:

- A. High fat
- B. High water content
- C. Bone
- D. Artifact

44. What does MPR stand for in CT?

- A. Maximum Plane Rotation
- B. Multi-Planar Reconstruction
- C. Motion Processing Radiology
- D. Multi-Pixel Recording

45. MRI is superior to CT in:

- A. Acute hemorrhage
- B. Bone fracture
- C. Spinal cord pathology
- D. Lung nodule

46. Slice interpolation in CT helps with:

- A. Bone artifact
- B. Faster MRI
- C. Creating 3D volume
- D. Measuring HU

47. The CT artifact seen with patient motion:

- A. Streak
- B. Ring
- C. Motion blur
- D. Cupping

48. Magnetic field in MRI is:

- A. Ionizing
- B. Non-ionizing
- C. Radioactive
- D. UV-based

49. CT scan of abdomen uses contrast to differentiate:

- A. Kidney from spleen
- B. Liver from stomach
- C. Bowel from vessels
- D. All of the above

50. MRI provides better contrast resolution than CT because:

- A. Uses iodine
- B. Higher kVp
- C. Tissue relaxation properties
- D. More radiation

Answer Key with Explanations

1. ✓C – CT acquires axial images primarily
2. ✓B – Hydrogen nuclei (protons) are key in MRI
3. ✓B – HU of air = -1000
4. ✓C – Pacemakers can malfunction in MRI
5. ✓B – CT is superior for detecting fractures
6. ✓B – Fat is bright on T1 MRI
7. ✓C – Gantry contains rotating tube and detectors
8. ✓B – Gadolinium is the most used MRI contrast agent
9. ✓B – Pitch affects scan speed and dose
10. ✓C – CT is best for pulmonary embolism
11. ✓C – MRI uses RF pulses, not ionizing radiation
12. ✓C – Contrast reactions are usually mild
13. ✓B – Fluids appear bright on T2
14. ✓A – MRI field strength is measured in Tesla
15. ✓C – Signal arises from spinning hydrogen nuclei
16. ✓B – Width affects contrast
17. ✓B – Water HU = 0
18. ✓A – Multislice = fast scan, thin slices, 3D
19. ✓B – MRI zones 1 to 4 indicate safety levels
20. ✓B – T2 highlights edema
21. ✓A – Pitch controls dose and speed
22. ✓B – Ortho screws are usually MRI safe
23. ✓B – Metal = streak artifact in CT

24. ✓C – Gadolinium is renally excreted
25. ✓A – Fat is around –100 HU
26. ✓B – TR and TE are timing values
27. ✓B – Collimation controls slice thickness
28. ✓C – MRI rooms are RF shielded
29. ✓D – Most scanners are 1.5T or 3T
30. ✓C – Higher field = better SNR
31. ✓B – Rotating anode used in X-ray and CT
32. ✓C – T2 is ideal for edema
33. ✓B – CTA shows blood vessels
34. ✓B – DWI = acute stroke detection
35. ✓B – FLAIR suppresses CSF
36. ✓C – CT uses ionizing X-rays
37. ✓C – Patient stillness reduces artifacts
38. ✓A – Voxel size = FOV/matrix/slice
39. ✓B – CT detectors convert to electrical signal
40. ✓D – MRI screening checks for all these
41. ✓D – Trauma is the top reason for CT head
42. ✓A – Coronal is perpendicular to axial
43. ✓B – T2 hyperintensity = high water
44. ✓B – MPR = multi-planar reconstruction
45. ✓C – MRI better for spinal cord imaging
46. ✓C – Interpolation builds 3D volume from slices
47. ✓C – Motion blur results from movement
48. ✓B – MRI uses non-ionizing magnetic fields
49. ✓D – Contrast helps in all these differentiations
50. ✓C – MRI contrast depends on T1/T2 relaxation, not radiation

One-Liner Revision Sheet

Anatomy & Physiology

- The nephron is the functional unit of the kidney.
- Alveoli are the site of gas exchange in the lungs.
- The liver lies in the right upper quadrant and stores glycogen.
- Insulin is secreted by pancreatic beta cells.
- The spleen filters and stores blood; it's part of the lymphatic system.

Radiographic Physics & Imaging

- X-rays are produced when high-speed electrons strike the anode target.
- kVp controls X-ray beam quality (penetration), mAs controls quantity.

- Grids reduce scatter; collimation reduces dose and improves contrast.
 - CT uses X-rays; MRI uses non-ionizing radiofrequency pulses.
 - PACS = Picture Archiving and Communication System; DICOM = image format standard.
-

CT & MRI

- Water = 0 HU, air = -1000 HU, fat \approx -100 HU in CT.
 - T1 MRI: fat is bright; T2 MRI: fluid is bright.
 - Gadolinium is the most common MRI contrast agent.
 - MRI contraindicated in pacemakers, some implants, and metallic foreign bodies.
 - CT better for bone; MRI better for soft tissue & spinal cord.
-

Trauma & Emergency

- Erect PA chest is preferred to detect pneumothorax.
 - Jefferson fracture = C1 ring; Hangman's = C2 fracture.
 - FAST scan detects intra-abdominal bleeding.
 - Widened mediastinum = possible aortic injury.
 - Clavicle is the most commonly fractured bone in adults.
-

Radiation Safety & QA

- ALARA = As Low As Reasonably Achievable.
 - Lead apron should be ≥ 0.5 mm Pb equivalent.
 - Annual occupational dose limit: 50 mSv.
 - AEC automatically adjusts exposure to reduce dose.
 - QA = image quality & safety; QC = test procedures to maintain quality.
-

Positioning & Procedures

- AP pelvis CR: 2" below ASIS; lateral knee: 30° flexion.
- Waters view best shows maxillary sinuses.
- Left lateral decubitus detects air-fluid levels in abdomen.
- Open-mouth view visualizes the odontoid (dens).
- Scapular Y view is used for shoulder dislocations.

Interventional Radiology

- IR uses imaging to guide minimally invasive procedures.
- Femoral artery is the most common access site.
- Embolization blocks abnormal blood flow; chemoembolization treats liver tumors.
- Coaxial needles allow multiple samples via one puncture.
- PICC lines are placed using ultrasound guidance.

PACS, RIS & Digital Imaging

- RIS manages scheduling and reporting; PACS stores and retrieves images.
- DICOM ensures interoperability between imaging systems.
- SMPTE pattern is used to test monitor display.
- Reject analysis helps identify technologist errors and equipment faults.
- A repeat rate >10% may indicate training or QA issues.

Cross-Sectional Imaging

- MRI signal comes from spinning protons (hydrogen nuclei).
 - MRI field strength is measured in Tesla; common scanners are 1.5T and 3T.
 - CT pitch affects scan speed and dose; lower pitch = higher dose.
 - T2-weighted MRI is best for edema; FLAIR suppresses CSF.
 - CT angiography is excellent for evaluating blood vessels.
-

Mock Exam Simulation – Set A

☐ **Total: 50 Questions** | ☐ *Simulated Exam Format*
! Don't scroll down for answers until you're finished.

1. The functional unit of the kidney is the:

- A. Nephron
- B. Glomerulus
- C. Ureter
- D. Collecting duct

2. In MRI, the most commonly imaged atom is:

- A. Oxygen
- B. Carbon
- C. Hydrogen
- D. Sodium

3. Which radiation interaction dominates in soft tissue imaging?

- A. Compton scatter
- B. Photoelectric effect
- C. Pair production
- D. Coherent scatter

4. Jefferson fracture involves:

- A. Axis (C2)
- B. Atlas (C1)
- C. Dens
- D. T1 vertebra

5. PACS is primarily used for:

- A. Storing and retrieving digital images
 - B. Radiation monitoring
 - C. Patient transport
 - D. Dose estimation
-

6. Which CT parameter most affects radiation dose?

- A. Gantry tilt
- B. Pitch
- C. FOV
- D. Matrix size

7. T2-weighted MRI images show water as:

- A. Dark
- B. Bright
- C. Gray
- D. Suppressed

8. Which plane divides the body into anterior and posterior parts?

- A. Axial
- B. Sagittal
- C. Coronal
- D. Oblique

9. The first radiograph in trauma protocol is often a:

- A. Skull AP
- B. Lateral cervical spine
- C. Chest AP
- D. Pelvis AP

10. What is the Hounsfield Unit of air?

- A. -100
- B. 0
- C. -1000
- D. +1000

11. MRI contraindication includes:

- A. Dental fillings
- B. Cochlear implants
- C. Surgical clips
- D. Vascular stents

12. AEC in radiography primarily helps in:

- A. Enhancing image contrast
- B. Automatically selecting kVp
- C. Minimizing patient dose
- D. Adjusting patient position

13. The pixel is defined as:

- A. Volume element
- B. Picture element
- C. Detector
- D. Contrast unit

14. The imaging view best for maxillary sinuses is:

- A. Caldwell
- B. Waters
- C. Lateral
- D. Townes

15. The most radiolucent tissue in X-ray is:

- A. Bone
- B. Muscle
- C. Air
- D. Fat

16. The photoelectric effect is more likely with:

- A. High kVp and low Z materials
- B. Low kVp and high Z materials
- C. High kVp and high Z materials
- D. Low kVp and low Z materials

17. CT is preferred over MRI in:

- A. Ligament tear
- B. Brain tumor
- C. Renal artery stenosis
- D. Pulmonary embolism

18. Which test assesses spatial resolution in QC?

- A. Step wedge
- B. Line pair phantom
- C. SMPTE test
- D. Beam alignment tool

19. A fracture with multiple fragments is:

- A. Spiral
- B. Greenstick
- C. Comminuted
- D. Oblique

20. FLAIR MRI sequence suppresses:

- A. Blood
- B. CSF
- C. Fat
- D. Bone

21. What does RIS manage?

- A. Image acquisition
- B. Scheduling, reporting, and workflow
- C. PACS archiving
- D. Contrast injection

22. The primary advantage of multislice CT:

- A. Slow scanning
- B. Poor resolution
- C. Thin, fast scans with 3D capability
- D. Uses no contrast

23. The best view to demonstrate pleural effusion in a non-ambulatory patient is:

- A. Supine chest
- B. Erect chest
- C. Left lateral decubitus
- D. Prone abdomen

24. The modality best suited for intervertebral disc herniation is:

- A. CT
- B. PET
- C. MRI
- D. X-ray

25. The most common site of injury in cervical spine trauma:

- A. C1
 - B. C2
 - C. C5–C6
 - D. C7
-

26. Which QA tool tests monitor grayscale?

- A. Densitometer
- B. Lux meter
- C. SMPTE test pattern
- D. AEC detector

27. Barium is contraindicated in:

- A. Constipation
- B. Suspected perforation
- C. Obstruction
- D. Diarrhea

28. A streak artifact in CT is usually caused by:

- A. Motion
- B. Metallic implants
- C. Calibration error
- D. Low contrast agent

29. Which catheter is common in cerebral angiography?

- A. Foley
- B. Simmons
- C. Pigtail
- D. Judkins

30. Which imaging shows gallstones best?

- A. MRI
 - B. CT
 - C. Ultrasound
 - D. PET
-

31. The HU of fat is approximately:

- A. -100
- B. 0
- C. +50
- D. +100

32. Which view is best for shoulder dislocation?

- A. AP
- B. Scapular Y
- C. Axial
- D. Lateral

33. MRI safety screening includes:

- A. Piercings
- B. Implants
- C. Tattoos
- D. All of the above

34. A portacath is used for:

- A. Drainage
- B. Dialysis
- C. Long-term venous access
- D. Blood pressure

35. The unit of absorbed dose is:

- A. Gray
 - B. Sievert
 - C. Becquerel
 - D. Rem
-

36. The safest contrast agent for renal patients is:

- A. Gadolinium
- B. High-osmolar iodine
- C. Barium
- D. Low-osmolar nonionic iodine

37. Teleradiology allows:

- A. Hardcopy printing
- B. Transmitting images remotely
- C. Manual film processing
- D. PACS data wipe

38. Seldinger technique is used for:

- A. Radiotherapy
- B. Surgical resection
- C. Vascular access
- D. Anesthesia delivery

39. Which modality provides best contrast resolution?

- A. X-ray
- B. CT
- C. MRI
- D. Ultrasound

40. Most repeat X-rays are due to:

- A. Patient movement
- B. Positioning error
- C. Exposure issues
- D. All of the above

41. CT scan uses:

- A. Radiofrequency waves
- B. Ionizing radiation
- C. Ultrasound
- D. Magnetic field

42. Lead apron minimum thickness:

- A. 0.25 mm Pb
- B. 0.35 mm Pb
- C. 0.5 mm Pb
- D. 1 mm Pb

43. The first line of immune defense:

- A. Antibodies
- B. Skin and mucosa
- C. Lymphocytes
- D. T-cells

44. PET imaging detects:

- A. Electrical activity
- B. Radioactive tracer uptake
- C. X-ray absorption
- D. Sound reflection

45. CT gantry contains:

- A. Patient table
- B. Image console
- C. Rotating tube and detectors
- D. PACS server

46. Gadolinium is eliminated via:

- A. Liver
- B. Spleen
- C. Kidneys
- D. Lungs

47. Which technique improves MRI SNR?

- A. Lower field strength
- B. Small coil
- C. High field strength
- D. Increasing TR

48. The purpose of a grid in radiography:

- A. Increase brightness
- B. Block primary beam
- C. Reduce scatter
- D. Filter contrast

49. Vertebroplasty is guided by:

- A. CT
- B. Ultrasound
- C. MRI
- D. Fluoroscopy

50. CT window level controls:

- A. Field of view
- B. Image contrast
- C. Image brightness
- D. Patient dose

Mock Exam – Set A: Answer Key

1. ✓A – Nephron is the kidney's functional unit.
2. ✓C – MRI targets hydrogen (abundant in water & fat).
3. ✓A – Compton scatter predominates in soft tissue at diagnostic energy.
4. ✓B – Jefferson fracture involves C1 (atlas).
5. ✓A – PACS stores/retrieves radiology images.
6. ✓B – Pitch affects radiation dose and scan speed.
7. ✓B – T2 MRI: fluid = bright (high signal).
8. ✓C – Coronal divides anterior/posterior.
9. ✓C – Chest X-ray is usually the first trauma image.
10. ✓C – Air has HU of -1000.

-
11. ✓B – Cochlear implants are contraindicated in MRI.
 12. ✓C – AEC minimizes dose by controlling exposure time.
 13. ✓B – Pixel = picture element (2D); voxel = 3D.
 14. ✓B – Waters view visualizes maxillary sinuses.
 15. ✓C – Air is most radiolucent (least dense).
 16. ✓B – Photoelectric effect favors low kVp + high Z (atomic number).
 17. ✓D – CT is better for PE due to speed and contrast resolution.
 18. ✓B – Line pair phantom measures spatial resolution.
 19. ✓C – Comminuted = multiple fracture fragments.
 20. ✓B – FLAIR suppresses CSF to highlight brain lesions.

-
21. ✓B – RIS handles scheduling, reporting, workflow.
 22. ✓C – Multislice CT allows fast scans and 3D images.
 23. ✓C – Decubitus chest best shows fluid when patient can't stand.
 24. ✓C – MRI is best for disc herniation.
 25. ✓C – C5–C6 is the most mobile and vulnerable cervical level.
 26. ✓C – SMPTE pattern tests monitor grayscale & sharpness.
 27. ✓B – Barium is contraindicated in suspected perforation.
 28. ✓B – Metal causes streak artifact in CT.
 29. ✓B – Simmons catheter is used in cerebral angio.
 30. ✓C – Ultrasound best for gallstones (radiolucent).

-
31. ✓A – Fat HU \approx -100.
32. ✓B – Scapular Y view shows shoulder dislocation.
33. ✓D – All must be checked in MRI safety.
34. ✓C – Portacath gives long-term venous access.
35. ✓A – Gray is the SI unit for absorbed dose.
36. ✓D – Nonionic, low-osmolar iodine is safest for kidneys.
37. ✓B – Teleradiology allows remote image transmission.
38. ✓C – Seldinger technique = safe vascular access method.
39. ✓C – MRI offers superior contrast resolution.
40. ✓D – All these cause repeat exposures.

-
41. ✓B – CT uses ionizing X-rays.
42. ✓C – Minimum apron thickness = 0.5 mm Pb.
43. ✓B – Skin/mucosa = 1st immune defense.
44. ✓B – PET detects radioactive tracer uptake.
45. ✓C – Gantry contains rotating tube and detectors.
46. ✓C – Gadolinium is renally excreted.
47. ✓C – Higher field strength improves MRI SNR.
48. ✓C – Grid removes scatter, improves contrast.
49. ✓D – Vertebroplasty is guided with fluoroscopy.
50. ✓C – Window level controls image brightness in CT.

Your score :-

Mock Exam Simulation – Set B

- ☐ **50 Questions** | *Mixed topics from Practice Sets 1–10*
 - ☐ **Answers and explanations** will be shared after you finish.
-

1. The part of the brain that controls breathing is:

- A. Cerebrum
- B. Cerebellum
- C. Medulla oblongata
- D. Thalamus

2. Which imaging modality is safest in pregnancy?

- A. CT
- B. X-ray
- C. MRI (non-contrast)
- D. Fluoroscopy

3. The structure separating the thoracic and abdominal cavities is the:

- A. Liver
- B. Diaphragm
- C. Pleura
- D. Peritoneum

4. Photoelectric effect contributes most to:

- A. Image contrast
- B. Radiation dose
- C. Scatter
- D. Image blur

5. The heart shadow in a PA chest appears:

- A. Enlarged
- B. Normal size
- C. Overlapped by spine
- D. Rotated

6. A “double bubble” sign on pediatric X-ray indicates:

- A. Intussusception
- B. Duodenal atresia
- C. Pyloric stenosis
- D. Appendicitis

7. DICOM tag stores:

- A. Only contrast type
- B. Patient, image, and scan data
- C. Technician name
- D. Radiologist comments

8. Which pulse sequence best detects acute stroke in MRI?

- A. T1
- B. FLAIR
- C. DWI
- D. GRE

9. AEC chambers are located:

- A. Behind the grid
- B. In front of the cassette
- C. Inside the tube
- D. Under the patient table

10. Which imaging is best for detecting renal calculi?

- A. Ultrasound
- B. MRI
- C. CT (non-contrast)
- D. IVU

11. In PACS, an archive server provides:

- A. Image interpretation
- B. Monitor testing
- C. Long-term image storage
- D. Tube warm-up

12. Collimation in X-ray improves:

- A. Image noise
- B. Scatter reduction
- C. Exposure time
- D. Field size

13. Which of the following is a nephrotoxic risk?

- A. Oral contrast
- B. Iodinated IV contrast
- C. Gadolinium
- D. Normal saline

14. T1-weighted MRI shows CSF as:

- A. Bright
- B. Dark
- C. Gray
- D. No signal

15. Which part of the GI tract is retroperitoneal?

- A. Sigmoid colon
- B. Duodenum (2nd part)
- C. Stomach
- D. Transverse colon

16. Dose area product (DAP) reflects:

- A. Dose at skin level
- B. Dose \times field area
- C. Dose at detector
- D. Grid ratio

17. Lead gloves are required during:

- A. CT
- B. MRI
- C. Fluoroscopy
- D. Ultrasound

18. Which CT artifact forms a concentric circle?

- A. Beam hardening
- B. Ring artifact
- C. Motion blur
- D. Streak artifact

19. MRI zone 4 refers to:

- A. Waiting room
- B. Console room
- C. Scanner room
- D. Dressing room

20. The liver lies in which quadrant?

- A. LUQ
- B. RUQ
- C. LLQ
- D. RLQ

21. PACS workstations are used for:

- A. Data backup
- B. Image interpretation
- C. Contrast injection
- D. Patient prep

22. The “scotty dog” sign in lumbar spine oblique view indicates:

- A. Fracture of vertebral body
- B. Pars interarticularis
- C. Transverse process
- D. Disc herniation

23. Pulmonary embolism is best detected using:

- A. MRI
- B. Chest X-ray
- C. CT pulmonary angiography
- D. Ultrasound

24. Linearity test in QA checks:

- A. Image size
- B. Radiation output at different mA
- C. Exposure time
- D. Detector speed

25. Tissues appear black on X-ray because they:

- A. Absorb radiation
 - B. Scatter radiation
 - C. Transmit radiation
 - D. Refract radiation
-

26. Which organ is most sensitive to ionizing radiation?

- A. Muscle
- B. Liver
- C. Gonads
- D. Pancreas

27. MRI provides:

- A. High spatial and contrast resolution
- B. Ionizing radiation
- C. Low soft tissue contrast
- D. High bone detail

28. Low pitch in CT leads to:

- A. Faster scan
- B. Lower dose
- C. Overlapping slices and higher dose
- D. Poor resolution

29. Ghost artifacts in CR are due to:

- A. Scatter radiation
- B. Partial erasure of IP
- C. Beam misalignment
- D. Low contrast

30. CT attenuation depends on:

- A. Distance
 - B. Atomic number and density
 - C. Field size
 - D. Detector shape
-

31. The MRI sequence most sensitive to hemorrhage is:

- A. T1
- B. T2
- C. Gradient Echo (GRE)
- D. FLAIR

32. The most radiosensitive cell type:

- A. Muscle
- B. Nerve
- C. Lymphocyte
- D. Cartilage

33. Fluoroscopy allows:

- A. Static imaging
- B. Real-time dynamic imaging
- C. Non-ionizing scan
- D. 3D reconstructions

34. CT number of compact bone is approximately:

- A. +100
- B. -500
- C. +1000
- D. 0

35. The contrast agent used in GI fluoroscopy is:

- A. Gadolinium
 - B. Iodinated non-ionic
 - C. Barium sulfate
 - D. Technetium
-

36. Posteroanterior (PA) chest X-ray reduces:

- A. Radiation to back
- B. Lung detail
- C. Heart magnification
- D. Contrast

37. In IVU, nephrogram phase is captured:

- A. Immediately after contrast injection
- B. 5 min after
- C. 15 min after
- D. 30 min after

38. MRI room shielding is made of:

- A. Lead
- B. Copper or aluminum
- C. Plastic
- D. Glass

39. Dose limits for the public (ICRP) per year:

- A. 10 mSv
- B. 5 mSv
- C. 1 mSv
- D. 50 mSv

40. An axial CT image is viewed as if looking:

- A. From the head down
- B. From the feet up
- C. From the side
- D. From behind

41. Ureteric calculi are best seen in:

- A. Chest X-ray
- B. Supine abdomen
- C. KUB
- D. IV contrast-enhanced CT

42. The best sequence for spinal cord lesion in MRI:

- A. T1
- B. T2
- C. FLAIR
- D. STIR

43. An open fracture involves:

- A. Ligament rupture
- B. Air in soft tissues
- C. Fracture with skin break
- D. Bone impaction

44. Automatic tube current modulation (ATCM) in CT adjusts:

- A. Field of view
- B. Scan range
- C. Dose according to patient size
- D. Image orientation

45. Axial shoulder projection best demonstrates:

- A. AC joint
- B. Clavicle
- C. Glenoid cavity
- D. Scapular spine

46. In trauma, which radiograph can detect pelvic bleeding early?

- A. Skull
- B. Supine abdomen
- C. Pelvis AP
- D. Chest lateral

47. MR-safe implant means:

- A. Fully ferromagnetic
- B. Partially radio-opaque
- C. Non-magnetic and safe in MRI field
- D. Detachable under anesthesia

48. MRI contrast enhances:

- A. Air spaces
- B. Vascular and soft tissue structures
- C. Bone cortex
- D. Skin folds

49. Which software protocol allows RIS-PACS communication?

- A. DICOM
- B. HL7
- C. SMPTE
- D. HIPAA

50. Bone windows in CT enhance visualization of:

- A. Liver
- B. Lung
- C. Skull and spine
- D. Spleen

Mock Exam – Set B: Answer Key & Explanations

1. ✓C – Medulla oblongata controls breathing.
 2. ✓C – MRI without contrast is safest in pregnancy.
 3. ✓B – Diaphragm separates thoracic and abdominal cavities.
 4. ✓A – Photoelectric effect increases image contrast.
 5. ✓B – PA chest minimizes heart magnification = true size.
-
6. ✓B – “Double bubble” indicates duodenal atresia in neonates.
 7. ✓B – DICOM tags store image + patient metadata.
 8. ✓C – DWI is highly sensitive for acute stroke.

9. ✓A – AEC chambers are between grid and image receptor.

10. ✓C – CT (non-contrast) is best for kidney stones.

11. ✓C – Archive server stores images long-term.

12. ✓B – Collimation reduces scatter and dose.

13. ✓B – Iodinated contrast (IV) is nephrotoxic.

14. ✓B – CSF appears dark on T1 MRI.

15. ✓B – 2nd part of duodenum is retroperitoneal.

16. ✓B – DAP = dose \times irradiated field area.

17. ✓C – Lead gloves are required in fluoroscopy.

18. ✓B – Ring artifact = detector malfunction in CT.

19. ✓C – Zone 4 is the MRI scanner room.

20. ✓B – Liver lies in the right upper quadrant (RUQ).

21. ✓B – PACS workstations are used for interpretation.

22. ✓B – “Neck” of Scotty dog = pars interarticularis.

23. ✓C – CTPA is gold standard for pulmonary embolism.

24. ✓B – Linearity checks consistent output across mA stations.

25. ✓C – Radiolucent = transmits X-rays (appears black).

26. ✓C – Gonads are highly radiosensitive.

27. ✓A – MRI has high spatial and contrast resolution.
28. ✓C – Low pitch = overlap = higher dose, better detail.
29. ✓B – Ghosting = incomplete IP erasure in CR.
30. ✓B – CT attenuation depends on atomic number + density.
-

31. ✓C – GRE is sensitive to hemorrhage/iron.
32. ✓C – Lymphocytes are most radiosensitive.
33. ✓B – Fluoroscopy provides real-time dynamic imaging.
34. ✓C – Bone HU = +1000 approx.
35. ✓C – Barium is used in GI fluoroscopy.
-

36. ✓C – PA chest reduces heart magnification.
37. ✓A – Nephrogram phase is immediate post-injection.
38. ✓B – MRI shielding is RF (copper, aluminum).
39. ✓C – Public dose limit = 1 mSv/year (ICRP).
40. ✓A – CT axial viewed from head down.
-

41. ✓D – Non-contrast CT best detects ureteric stones.
42. ✓B – T2 shows spinal cord lesions (fluid sensitivity).
43. ✓C – Open fracture = bone + overlying skin breach.
44. ✓C – ATCM modulates mA based on patient thickness.
45. ✓C – Axial shoulder = glenoid cavity best seen.

-
46. ✓C – AP pelvis shows pelvic trauma/bleeding.
47. ✓C – MR-safe = no magnetic interaction.
48. ✓B – MRI contrast enhances vessels and soft tissue.
49. ✓B – HL7 allows RIS ↔ PACS data communication.
50. ✓C – Bone window = spine, skull, joints.
-

You score :-



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