BLDE (DEEMED TO BE UNIVERSITY)

B.Sc. in Medical Imaging Technology

Jan-26

[Time: 3 Hours] [Max. Marks: 80]

VI SEMESTER

PAPER I - (Quality Assurance in Medical Imaging)

QP CODE: 8625

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions **10X1 = 10 Marks**

1. Explain in detail about the layout and basic requirements of an X-ray department.

Short Essays: (Any – 8) **5 X 8 = 40 Marks**

2. What are the aims and importance of Quality Assurance in Radiology?
3. Describe the functions of grids and collimators in improving image quality.
4. Write about film and chemical storage in the darkroom.
5. What is a water phantom? Explain its use in Quality Assurance.
6. Explain the purpose and structure of a Potter-Bucky diaphragm.
7. Discuss the different types of patient positioning aids used in Radiology.
8. What steps should be taken while installing new X-ray equipment?
9. Explain the role of lead aprons and gloves in radiation protection.
10. Describe the uses of measuring calipers in radiographic procedures.

Short Answers: (Any – 10) **3 X 10 = 30 Marks**

11. What is x ray Generator and its types?
12. What is an aluminum step wedge?
13. What is the function of the viewing box in Radiology?
14. Write any two beam limiting devices.
15. What should be the location of the patient waiting area?
16. Name any two accessories used in radiology quality control.
17. What are the functions of intensifying screens?
18. What are the basic criteria for a good portable X-ray unit?
19. Define the term "Tomography test tools."
20. What are the adjacent departments to the Radiology section?
21. How does the X-ray tube quality affect the image?

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PAPER II - (Modern Technologies in Imaging)

QP CODE: 8626

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions **10X1 = 10 Marks**

1. Explain the Construction of Ultrasound transducer?

Short Essays: (Any – 8) **5 X 8 = 40 Marks**

2. What is T2 relaxation?
3. Explain the types of Spin echo sequence?
4. What is Helical CT Artifact?
5. What is K-space?
6. Write about Patient dose in CT scan?
7. What are the characteristics of piezoelectric effect?
8. Explain slip ring technology?
9. What is Precession, Lamour equation and Resonance?
10. Write about Data Acquisition System (DAS)?

Short Answers: (Any – 10) **3 X 10 = 30 Marks**

11. What are the ingredients of USG Gel?
12. What is shimming in MRI?
13. Write the important facts about K-space?
14. What are Stair Step and Cone Beam Artifact in CT scan?
15. What is Aliasing Artifact in CT scan?
16. Write the difference between T1 and T2 relaxation?
17. What is Filtered back projection in CT scan?
18. What are the factors affecting SNR?
19. What is Gantry cooling?
20. What is Patient Motion Artifact in CT scan?
21. What are the three major systems of CT scan and draw a diagram of imaging system?

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VI SEMESTER

PAPER III - (Radiation Physics & Radiation Protection)

QP CODE: 8627

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions **10X1 = 10 Marks**

1. Explain about natural radiation sources and man-made settings. Describe their contribution to radiation exposure.

Short Essays: (Any – 8) **5 X 8 = 40 Marks**

2. Write about Acute Radiation Syndrome (ARS)
3. Explain the types of radiation quantities and units.
4. Describe stochastic vs. non-stochastic (deterministic) effects with an examples.
5. Explain the cardinal principles of radiation protection, with simple sketches.
6. Write a note on half-value layer (HVL) and tenth-value layer (TVL) with simple calculations.
7. Explain the construction and working principle of TLD badge.
8. What are regulatory bodies? And List the ICRP annual dose limits for occupational workers and the public.
9. Describe barrier design with neat diagrams, and explain primary and secondary barriers.
10. Explain good work practices in a diagnostic radiology room to reduce patient and staff dose.

Short Answers: (Any – 10) **3 X 10 = 30 Marks**

11. Define radioactivity and half-life.
12. What is KERMA?
13. Write a note on somatic and genetic effects of radiation.
14. Draw and label the radiation trefoil symbol (show basic dimensions).
15. State uses of gonadal shielding and thyroid shielding.
16. What is the principle of ICRP regulatory body.
17. Define workload and calculate the factors.
18. What are ideal features of a personal monitoring device?
19. What is leakage radiation and scatter radiation?
20. Draw a neat labelled diagram of TLD DISC and write its construction
21. Sketch a simple X-ray room layout showing tube, table, control console, and barriers.

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VI SEMESTER

PAPER IV - (BMIT Directed Clinical Education-IV)

QP CODE: 8628

Your answer should be specific to the questions asked.
Write Question No. in left side of margin.

Long Questions **10X1 = 10 Marks**

1. Draw a neat labelled diagram of the heart and explain the flow of blood through the chambers and great vessels.

Short Essays: (Any – 8) **5 X 8 = 40 Marks**

2. Explain interaction of X-rays with matter (photoelectric, Compton, pair production) in brief.
3. Write the radiographic technique for Wrist joint—AP, Lateral, and Scaphoid (ulnar deviation) view.
4. Describe patient preparation and procedure steps for Barium Enema.
5. What is a grid? Write types of grids and their functions.
6. Explain the Anode Heel Effect and how to use it during positioning.
7. Write short notes on Darkroom layout—safelight, dry bench, wet bench, and chemical handling.
8. Mention the role of Ultrasound in 1st trimester of pregnancy.
9. Explain MRI artifacts (any five) and how to reduce them.
10. Draw a neat labelled diagram of the Hepato-biliary system and explain bile flow

Short Answers: (Any – 10) **3 X 10 = 30 Marks**

11. What is a control panel/console in an X-ray room?
12. Draw and label an intensifying screen and state its purpose.
13. What are autotransformer, step-up transformer, and step-down transformer?
14. List two medico-legal points to follow while taking radiographs.
15. Draw a neat labelled diagram of the lungs.
16. Name the lobes of the brain and the fissures separating them.
17. List the positioning and films taken in HSG.
18. Draw a labelled USG transducer and mention typical frequencies.
19. Write patient preparation and positioning for Knee AP view.
20. Write indications and contraindications for Cervical spine AP view.
21. Name the four components of PACS.