



PRACTICE SET
End Semester Examination, May 2026

Program: BMRIT

Semester: II

Subject: Conventional Radiography and Equipment

Subject Code: 42BBMRIT012

Course Outcome:

On the completion of the Course, the students will be able to:

Course Outcomes	Description
CO1	Describe the structure and working of x-ray tube, production of x-rays, types of x-ray tube and heat dissipation methods.
CO2	Describe the x-ray generator circuits and different circuit types.
CO3	Explain the list the control of scattered radiation.
CO4	Describe the meters and exposure timers.
CO5	Describes about the fluoroscopy and explains about the care and maintenance of x-ray equipment's.

UNIT I

Section A (10 marks)

1. Define "Thermionic Emission" in the context of X-ray production. [CO1, Remember, LOT]
2. Identify the ideal properties required for a target material in a diagnostic X-ray tube. [CO1, Remember, LOT]
3. Explain the significance of "Anode Angulation" in the Line Focus Principle. [CO1, Understand, LOT]
4. Analyze how the "Heel Effect" results in non-uniform intensity of the X-ray beam. [CO1, Analyze, HOT]
5. Describe the role of the focusing cup in the cathode assembly. [CO1, Understand, LOT]
6. Compare the cooling requirements of a stationary anode versus a rotating anode. [CO1, Analyze, HOT]

Section B (20 marks)

7. Evaluate the structural differences and operational advantages of a Grid Controlled X-ray tube. [CO1, Evaluate, HOT]
8. Create a detailed explanation of the X-ray production efficiency and the factors that influence it. [CO1, Create, HOT]

UNIT II

Section A (10 marks)

9. State the primary function of an auto-transformer in an X-ray circuit. [CO2, Remember, LOT]
10. Differentiate between half-wave and full-wave rectification in terms of voltage ripple. [CO2, Analyze, HOT]
11. Explain the purpose of a "Space Charge Compensator" in the filament circuit. [CO2, Understand, LOT]
12. Identify the role of a "Mains Voltage Compensator" in an X-ray machine. [CO2, Remember, LOT]
13. Analyze the benefit of using a high-frequency generator over a single-phase generator. [CO2, Analyze, HOT]
14. Describe the function of semiconductor diodes in modern rectification circuits. [CO2, Understand, LOT]

Section B (20 marks)

15. Evaluate the working principle of a Three-Phase generator (6-pulse vs 12-pulse) regarding power efficiency. [CO2, Evaluate, HOT]
16. Design a conceptual circuit layout illustrating the integration of an Automatic Exposure Control (AEC) system. [CO2, Create, HOT]

UNIT III

Section A (10 marks)

17. Define "Grid Ratio" and its relationship with clean-up efficiency. [CO3, Remember, LOT]
18. Explain the construction and function of a Light Beam Collimator (LBC). [CO3, Understand, LOT]
19. Analyze the causes of "Grid Cut-off" in focused grids. [CO3, Analyze, HOT]
20. Identify the difference between inherent filtration and added filtration. [CO3, Remember, LOT]
21. Describe the use of heavy metal filters in diagnostic radiography. [CO3, Understand, LOT]
22. Compare the performance of stationary grids versus moving Potter-Bucky diaphragms. [CO3, Analyze, HOT]

Section B (20 marks)

23. Create a Quality Assurance (QA) protocol to verify the alignment of the light beam and the X-ray field. [CO3, Create, HOT]
24. Analyze how beam limiting devices (cones and diaphragms) contribute to patient radiation safety. [CO3, Analyze, HOT]

UNIT IV

Section A (10 marks)

25. Describe the construction and working principle of a Moving Coil Galvanometer. [CO4, Understand, LOT]
26. Identify the clinical application of a Pre-reading kV meter. [CO4, Remember, LOT]
27. Explain the function of an Electronic Timer in achieving millisecond exposure accuracy. [CO4, Understand, LOT]
28. Analyze the advantages of Digital Panel Meters over analog meters in a modern console. [CO4, Analyze, HOT]
29. Define the working principle of a Synchronous Motor Timer. [CO4, Remember, LOT]
30. Differentiate between a Milli-ammeter and an mAs meter in a high-tension circuit. [CO4, Analyze, HOT]

Section B (20 marks)

31. Create a troubleshooting guide for timer inaccuracies in a diagnostic X-ray room. [CO4, Create, HOT]
32. Evaluate the technical factors that influence the choice of exposure time in pediatric vs. adult radiography. [CO4, Evaluate, HOT]

UNIT V

Section A (10 marks)

33. State the difference between fluorescence and phosphorescence. [CO5, Remember, LOT]
34. Describe the layers of a typical fluoroscopic screen construction. [CO5, Understand, LOT]
35. Analyze the physiological importance of "Dark Adaptation" for a radiologist. [CO5, Analyze, HOT]
36. Explain the general care and maintenance required for H.T. cables and tube stand. [CO5, Understand, LOT]

37. Identify the functional tests used to assess the performance of exposure timers. [**CO5, Remember, LOT**]
38. Analyze the importance of checking mechanical brakes and locks for patient safety. [**CO5, Analyze, HOT**]

Section B (20 marks)

39. Evaluate the methodology for the measurement of the focal spot size of an X-ray tube. [**CO5, Evaluate, HOT**]
40. Create a comprehensive maintenance and Quality Assurance (QA) schedule for a fluoroscopic unit. [**CO5, Create, HOT**]

Summary Sheet

CO Wise

CO	Q. No	Marks
CO1	1,2,3,4,5,6,7,8	100
CO2	9,10,11,12,13,14,15,16	100
CO3	17,18,19,20,21,22,23,24	100
CO4	25,26,27,28,29,30,31,32	100
CO5	33,34,35,36,37,38,39,40	100
Total		500

Unit Wise

Unit	Q. No	Marks
Unit 1	1,2,3,4,5,6,7,8	100
Unit 2	9,10,11,12,13,14,15,16	100
Unit 3	17,18,19,20,21,22,23,24	100
Unit 4	25,26,27,28,29,30,31,32	100
Unit 5	33,34,35,36,37,38,39,40	100
Total		500

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No	Marks
LOT	1, 2, 3, 5, 9,11,12,14,17,18,20,21,25,26,27,29,33,34,36,37	200
HOT	4, 6, 7, 8, 10,13,15,16,19,22,23,24,28,30,31,32,35,38,39,40	300
Total		500

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Disclaimer: -This is a Practice set. The Question in End term examination will differ from the Practice set. This Practice set is meant for practice only.