



UNIVERSITI KUALA LUMPUR
ROYAL COLLEGE OF MEDICINE PERAK

FINAL EXAMINATION
MARCH SEMESTER 2026

COURSE CODE : RXD23002
COURSE NAME : RADIOGRAPHIC INSTRUMENTATION II
PROGRAMME NAME : DIPLOMA IN MEDICAL IMAGING
DATE : 26 JUNE 2026
TIME : 9.00 A.M – 10.30 A.M
DURATION : 1 HOUR 30 MINUTES

INSTRUCTIONS TO CANDIDATES

1. Please read CAREFULLY the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of TWO (2) section; Section A and Section B.
4. Answer ALL questions in Section A. For Section B, answer THREE (3) questions ONLY.
5. Please mark/write your answers on the OMR answer script or answer booklet provided.
6. Answer ALL questions in English language ONLY.

THERE ARE 7 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A: MULTIPLE CHOICE QUESTIONS (Total: 15 marks)**INSTRUCTION: Answer ALL questions.****Please use the objective answer sheet provided.**

1. Identify the main function of x-ray tube support.
 - A. To increase focus film distance (FFD).
 - B. To support x-ray tube movement in safe condition.
 - C. To hold the x-ray beam collimator.
 - D. To center the x-ray beam to table bucky.
2. Select the x-ray tube support for mobile fluoroscopy machine.
 - A. C-Arm
 - B. Attached to x-ray table
 - C. Floor mounted
 - D. Floor to ceiling
3. Identify the benefit of applying small field of view (FOV) in medical imaging.
 - A. Increase image resolution.
 - B. Increase optical density on radiograph.
 - C. Increase image sharpness.
 - D. Increase radiographic contrast.
4. What is the purpose of x-ray beam filtration in general radiography machine?
 - A. To eliminate low energy radiation before it strikes the patient.
 - B. To eliminate high energy radiation before it strikes the patient.
 - C. To absorb scatter radiation from the patient.
 - D. To produce low energy radiation before it strikes the patient.
5. Find the factor that contributes to grid ratio.
 - A. The height of interspace.
 - B. Total number of lead strips.
 - C. Thickness of lead strips.
 - D. The width of the interspace.

6. Which method can reduce scatter radiation production?
- A. Increase field size.
 - B. Increase kVp.
 - C. Apply compression to the patient.
 - D. Increase exposure time.
7. Which x-ray beam restrictor uses adjustable lead shutters?
- A. Cone
 - B. Cylinder
 - C. Collimator
 - D. Aperture diaphragm
8. Identify the ideal x-ray photon energy range for breast imaging.
- A. 5 – 10 keV
 - B. 17 – 24 keV
 - C. 30 – 40 keV
 - D. 40 – 50 keV
9. Why in mammography use very small focal spot size?
- A. Increase image sharpness and resolution.
 - B. Produce lower energy photons for fatty breasts.
 - C. Produce higher energy photons for dense breasts.
 - D. Reduce exposure factor mAs.
10. Select the **CORRECT** statement regarding indirect digital imaging in fluoroscopy.
- A. Incident x-ray photon is converted to light and then the light will be converted to electrical charge.
 - B. Incident x-ray photon is converted to electron and then the electron will be converted to electrical charge.
 - C. Incident x-ray photon is converted to electrical charge and then it will be converted to electron.
 - D. Incident x-ray photon is converted to light and then it will be converted to electron.

11. Identify the small focal spot size for magnification in mammography.
- A. 0.1 mm
 - B. 0.3 mm
 - C. 0.6 mm
 - D. 1.2 mm
12. Why was the input phosphor in the image intensifier constructed in concave shape?
- A. To magnify the image.
 - B. To increase the light intensity.
 - C. To reduce image distortion.
 - D. To increase the image resolution.
13. Identify the input phosphor material in image intensifier.
- A. Sodium and caesium iodide crystals
 - B. Antimony and caesium (CsSb) crystals
 - C. Argon bromide crystals
 - D. Antimony trisulfite crystals
14. Identify the function of position indicating device (PID) in dental x-ray intraoral.
- A. To direct the primary x-ray beam to the patient.
 - B. To filter the low energy radiation before strike the patient.
 - C. To absorb the scatter radiation.
 - D. To aim the laser light to patient.
15. What is the direct effect of breast compression in mammography?
- A. Increase subject contrast.
 - B. Increase optical density on image.
 - C. Reduce subject thickness.
 - D. Increase image resolution.

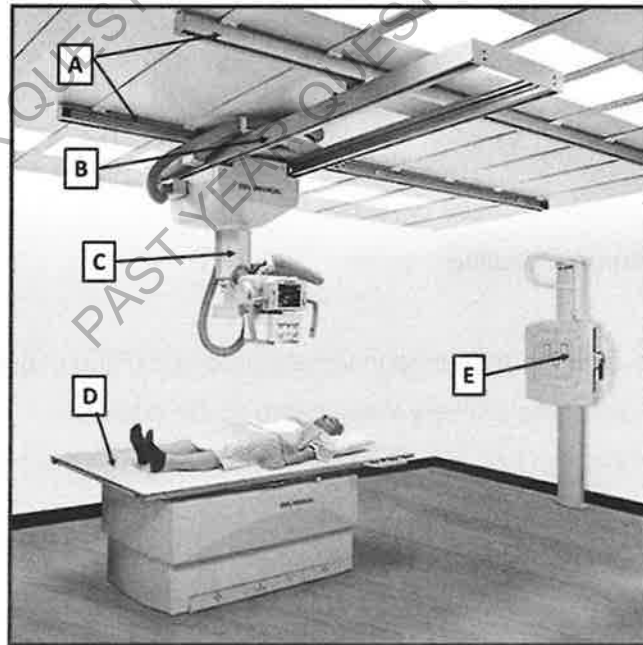
SECTION B: MODIFIED ESSAY QUESTIONS (MEQ) (Total: 60 marks)

INSTRUCTION: This section consists of **FOUR (4)** modified essay questions (MEQ). You are required to answer **ONLY THREE (3)** questions in the answer booklet provided.

Question 1

- (a) Identify the components labelled A to E in the diagram below:

(5 marks)



- (b) Identify **FIVE (5)** disadvantages of floor mounted x-ray tube support.

(5 marks)

- (c) Identify **FOUR (4)** benefits of the x-ray beam collimation in radiographic imaging.

(4 marks)

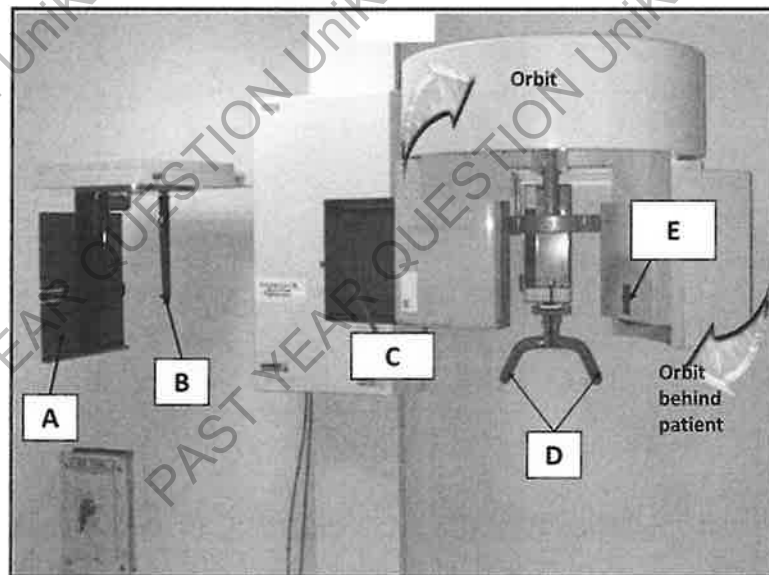
- (d) Describe **SIX (6)** characteristics of high-frequency generator in mammography.

(6 marks)

Question 2

- (a) Describe **FOUR (4)** construction features of fluoroscopy x-ray table for barium study. (4 marks)

- (b) Identify the components labelled A to E in the diagram below: (5 marks)

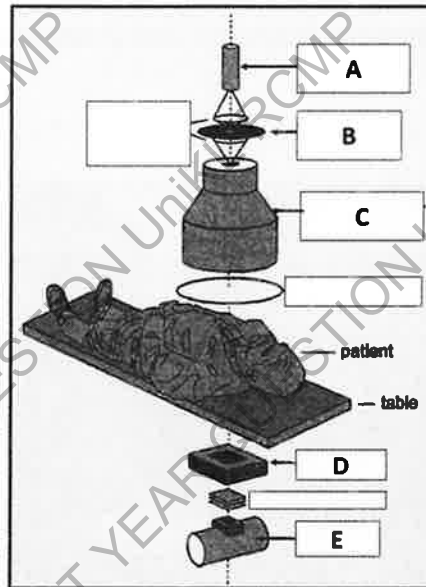


- (c) Identify **FIVE (5)** advantages of light beam diaphragm collimator. (5 marks)
- (d) Identify **THREE (3)** types of common grid errors in radiographic imaging. (6 marks)

Question 3

- (a) Identify the fluoroscopy components labelled A to E in the diagram below:

(5 marks)



- (b) Explain the image intensifier basic operation principle.

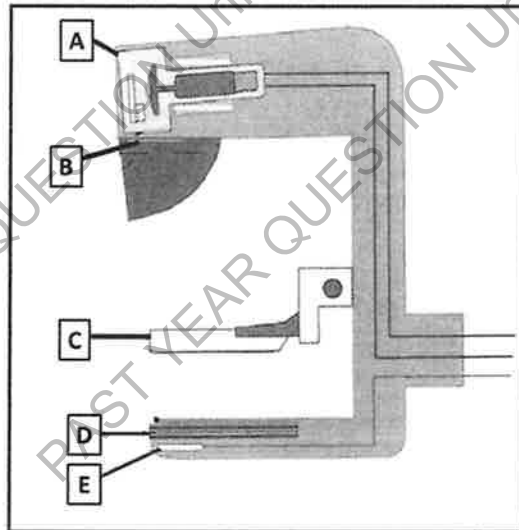
(10 marks)

- (c) Identify the advantages and disadvantages of battery-operated mobile x-ray machine.

(5 marks)

Question 4

- (a) Differentiate the characteristics of focus grid and parallel grid. (5 marks)
- (b) Identify the mammography components labelled A to E in the diagram below: (5 marks)



- (c) Identify the application of 'anode heel effect' principles in mammography machine. (5 marks)
- (d) Explain the image magnification process in image intensifier. (5 marks)

END OF EXAMINATION PAPER