

01	☐ A	☐ B	☐ C	☐ D	☐ E
02	☐ A	☐ B	☐ C	☐ D	☐ E
03	☐ A	☐ B	☐ C	☒ D	☐ E
04	☐ A	☐ B	☒ C	☐ D	☐ E
05	☐ A	☐ B	☐ C	☒ D	☐ E
06	☐ A	☐ B	☒ C	☐ D	☐ E
07	☐ A	☐ B	☒ C	☐ D	☐ E
08	☐ A	☐ B	☒ C	☐ D	☐ E
09	☐ A	☒ B	☐ C	☐ D	☐ E
10	☐ A	☐ B	☒ C	☐ D	☐ E
11	☐ A	☐ B	☒ C	☐ D	☐ E
12	☐ A	☒ B	☐ C	☐ D	☐ E
13	☐ A	☐ B	☒ C	☐ D	☐ E

14	☒ A	☐ B	☐ C	☐ D	☐ E
15	☐ A	☒ B	☐ C	☐ D	☐ E
16	☐ A	☐ B	☒ C	☐ D	☐ E
17	☐ A	☐ B	☒ C	☐ D	☐ E
18	☐ A	☒ B	☐ C	☐ D	☐ E
19	☐ A	☒ B	☐ C	☐ D	☐ E
20	☐ A	☐ B	☐ C	☐ D	☒ E
21	☐ A	☐ B	☒ C	☐ D	☐ E
22	☐ A	☐ B	☐ C	☐ D	☒ E
23	☐ A	☐ B	☒ C	☐ D	☐ E
24	☐ A	☒ B	☐ C	☐ D	☐ E
25	☒ A	☐ B	☐ C	☐ D	☐ E
26	☐ A	☐ B	☒ C	☐ D	☐ E

27	☐ A	☐ B	☐ C	☐ D	☒ E
28	☐ A	☒ B	☐ C	☐ D	☐ E
29	☐ A	☐ B	☒ C	☐ D	☐ E
30	☐ A	☒ B	☐ C	☐ D	☐ E
31	☒ A	☐ B	☐ C	☐ D	☐ E
32	☐ A	☐ B	☐ C	☐ D	☒ E
33	☐ A	☐ B	☐ C	☐ D	☒ E
34	☒ A	☐ B	☐ C	☐ D	☐ E
35	☐ A	☐ B	☒ C	☐ D	☐ E
36	☐ A	☐ B	☐ C	☒ D	☐ E
37	☐ A	☒ B	☐ C	☐ D	☐ E
38	☐ A	☒ B	☐ C	☐ D	☐ E
39	☐ A	☐ B	☐ C	☐ D	☒ E

PRACTICE QUESTIONS

Saudi Commission For Health Specialties (SCFHS)

NUMT

Nuclear Medicine Technologist

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Saudi Commission For Health Specialties (SCFHS) NUMT , each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, NUMT
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1

SINGLE CHOICE

A patient is administered 370 MBq of Tc-99m MDP for a bone scan. According to ALARA principles, which instruction provides the most effective reduction in radiation dose to the patient's family members after discharge?

- ☐ A Advise the patient to remain in bed for 24 hours
- ☒ B Encourage frequent voiding and good oral hydration for the first several hours
- ☐ C Instruct the patient to wear a lead apron for the remainder of the day
- ☐ D Recommend that the patient sleep in a separate room from the spouse for one week

ANSWER B

WHY Tc-99m MDP is cleared primarily by renal excretion. Frequent voiding and hydration accelerate clearance of unbound Tc-99m pertechnetate and reduce the effective half-life, lowering dose to others. Bed rest is unnecessary, lead aprons are not effective for the 140 keV photons of Tc-99m, and a one-week sleeping separation is excessive for a Tc-99m study (which is relevant for I-131 therapy but not diagnostic Tc-99m).

QUESTION 2

SINGLE CHOICE

During the daily QC of a dose calibrator, the technologist performs a constancy test using a long-lived reference source (e.g., Cs-137). The measured activity is 5% lower than the expected value. What is the most appropriate first action?

- ☐ A Immediately recalibrate the dose calibrator using the manufacturer's high-voltage adjustment
- ☒ B Repeat the constancy measurement; if still outside $\pm 10\%$, schedule service; document the result
- ☐ C Discard the reference source and order a replacement
- ☐ D Release the dose calibrator for patient use since 5% is clinically acceptable

ANSWER B

WHY Regulatory and professional standards (e.g., ACR, NRC, manufacturer guidance) require that constancy be within $\pm 10\%$; a single out-of-range reading is first repeated to rule out a random error or geometry/positioning mistake. Out-of-range results and corrective actions must be documented. The technologist is not authorized to perform internal high-voltage recalibration (a medical physicist or service engineer does that), the source is presumed valid, and 5% being 'acceptable' is not a substitute for the documented procedure.

QUESTION 3

SINGLE CHOICE

When preparing a Tc-99m HMPAO (Ceretek) kit for a brain SPECT study, which preparation step is essential to preserve the lipophilic complex needed for blood-brain barrier crossing?

- ☐ A Adding the generator eluate within 30 minutes of elution
- ☒ B Using a freshly eluted (<2 hours), high-activity Tc-99m pertechnetate
- ☐ C Adding a stabilizing excipient such as methylene blue before injection
- ☐ D Incubating the reconstituted vial at room temperature for 60 minutes

ANSWER B

WHY Tc-99m HMPAO must be labeled with freshly eluted Tc-99m pertechnetate because the lipophilic d,l-HMPAO complex is unstable and converts to the meso form (which does not cross the intact BBB) over time; the labeling efficiency is highest with low-Tc-99m-old eluate. Methylene blue is used for some kits (e.g., certain sulfur colloid preparations) but is not part of standard HMPAO labeling. Long room-temperature incubation degrades the product.

QUESTION 4

SINGLE CHOICE

For a Tc-99m sestamibi (MIBI) myocardial perfusion rest/stress study, what is the most likely cause of subdiaphragmatic activity ('uptake below the diaphragm') that can mimic or obscure inferior wall perfusion defects?

- ☐ A Free Tc-99m pertechnetate in the preparation
- ☒ B Hepatic and gastrointestinal activity adjacent to the inferior wall
- ☐ C Diffuse lung uptake from elevated pulmonary capillary wedge pressure
- ☐ D Splenic uptake from reticuloendothelial system labeling

ANSWER B

WHY Tc-99m sestamibi is excreted via the hepatobiliary system; prominent liver and bowel activity adjacent to the inferior myocardial wall is the classic source of attenuation-like artifacts (and is mitigated by delayed imaging or food). Free pertechnetate would localize in stomach and thyroid, not the liver. Lung uptake relates to severe CAD/CHF. Splenic uptake is from leukocyte labeling, not sestamibi.

QUESTION 5

SINGLE CHOICE

A pregnant technologist works in a nuclear medicine department. According to standard radiation protection guidance, what is the recommended dose limit to the embryo/fetus during the declared pregnancy?

- ☐ A 0.5 mSv per month
- ☐ B 5 mSv total over the gestation period
- ☒ C 1 mSv total over the gestation period
- ☐ D 50 mSv total over the gestation period

ANSWER C

WHY ICRP and most regulatory bodies (e.g., NRC, IAEA) recommend an occupational dose limit to the embryo/fetus of 1 mSv (100 mrem) once pregnancy is declared, with a monthly equivalent not exceeding 0.5 mSv in some guidance; the total gestational limit is 1 mSv. 5 mSv is the occupational annual limit for the whole body, and 50 mSv is far above the embryonal limit.

QUESTION 6

SINGLE CHOICE

A technologist sustains a minor skin contamination while eluting a Mo-99/Tc-99m generator. Which is the most appropriate immediate decontamination procedure?

- ☒ **A** Wash the area gently with mild soap and lukewarm water, monitoring with a survey meter, repeat if needed; do not use harsh scrubbing
- ☐ **B** Apply a strong bleach solution and scrub vigorously
- ☐ **C** Cover the area with an occlusive dressing to prevent spread
- ☐ **D** Wait 24 hours for physical decay before cleaning

ANSWER A

WHY Standard decontamination for skin contamination is gentle washing with mild soap and lukewarm water, with survey-meter monitoring; abrasion should be avoided because it increases skin permeability and systemic uptake. Harsh chemicals and scrubbing damage the skin barrier. Occlusive dressings are not used for decontamination. Delay is inappropriate when prompt decontamination reduces dose.

QUESTION 7

SINGLE CHOICE

A Mo-99/Tc-99m generator is eluted and yields a Tc-99m eluate that contains a high percentage of Mo-99 breakthrough. The most clinically significant consequence of this is:

- ☐ **A** Decreased image quality due to inferior photon energy
- ☒ **B** Increased unnecessary radiation dose to the patient from long-lived parent contamination
- ☐ **C** Loss of diagnostic specificity because Tc-99m is bound to plasma proteins
- ☐ **D** Premature generator failure due to alumina column exhaustion

ANSWER B

WHY Mo-99 has a half-life of ~66 hours and emits high-energy beta particles and photons; breakthrough raises the patient's absorbed dose without contributing useful diagnostic information. Regulatory limits (e.g., <0.15 µCi Mo-99 per mCi Tc-99m at calibration per USP) exist for this reason. Image quality is not primarily affected by Mo-99 photons at typical imaging energies; binding to plasma proteins is unrelated; column 'exhaustion' is not the principal safety concern.

QUESTION 8

SINGLE CHOICE

In the evaluation of a thyroid scan using Tc-99m pertechnetate, a 'cold' nodule is identified in the right lobe. Which statement best characterizes the clinical interpretation?

- ☒ **A** A cold nodule has a high likelihood of malignancy and warrants further evaluation (e.g., FNA)
- ☐ **B** A cold nodule indicates autonomously functioning tissue consistent with a toxic adenoma
- ☐ **C** A cold nodule represents diffuse thyroiditis
- ☐ **D** A cold nodule is benign and requires no follow-up

ANSWER A

WHY A 'cold' (non-functioning) nodule has a higher likelihood of malignancy (about 5–15%) compared with 'hot' nodules, which are usually benign. It requires further work-up, typically ultrasound and fine-needle aspiration. A hot nodule on a Tc-99m scan corresponds to functioning tissue (toxic adenoma); diffuse thyroiditis shows decreased uptake throughout, not a focal cold defect; cold nodules are not dismissed without work-up.

QUESTION 9

MULTIPLE CHOICE

Which of the following are components of the radiation protection program in a nuclear medicine department? (Choose two.)

- ☒ **A** Use of time, distance, and shielding to minimize exposure
- ☐ **B** Routine administration of potassium iodide (KI) to all staff members
- ☒ **C** Personnel monitoring with dosimeters and maintaining occupational dose records
- ☐ **D** Routine whole-body CT scanning of staff for radiation dose assessment

ANSWER A - C

WHY The core of radiation protection is the time-distance-shielding triad plus personnel dosimetry and dose-record keeping (ALARA program). KI prophylaxis is for radioiodine (e.g., I-131) exposure of the thyroid, not routine for staff of diagnostic nuclear medicine. CT is not used to measure occupational dose; dosimeters and bioassay (when indicated) are the appropriate methods.