

Final Exam for IS302
- Modular Emergency Radiological Response
Transportation Training

1. Ionizing radiation is defined as:
 - a. Any type of energy.
 - b. Radiation that has enough energy to remove electrons from atoms.
 - c. Unstable atoms in an unwanted place.
 - d. Energy that will destroy atoms.

2. Radioactive **material** is defined as:
 - a. Any material that spontaneously emits ionizing radiation.
 - b. Material found readily in nature.
 - c. Energy in the form of particles or waves given off by unstable atoms.
 - d. Any material that has been exposed to gamma radiation.

3. What is radioactive contamination?
 - a. Radioactive material in an unwanted or uncontrolled location.
 - b. Any material that contains radioactive (unstable) atoms.
 - c. Radiation in an unwanted location.
 - d. Any material that gives off radiation.

4. Radiation is _____; contamination is _____.
 - a. medicine; material.
 - b. material; energy.
 - c. atom; energy.
 - d. energy; material.

5. A person who is exposed to radiation will become contaminated.
 - a. True.
 - b. False.

6. Some commonly transported sources of radioactive material are:
 - a. Radio waves and medical procedures.
 - b. X-rays and visible light.
 - c. Asbestos and chlorine.
 - d. Radiopharmaceuticals and smoke detectors.

7. An acute dose of radiation refers to:
 - a. A small amount of radiation dose received in a short period of time.
 - b. A large amount of radiation dose received in a short period of time.
 - c. A small amount of radiation dose over a long period of time.
 - d. A large amount of radiation dose over a long period of time.

8. A small dose of radiation received over a long period of time is called:

- a. A chronic radiation dose.
- b. A prompt radiation dose.
- c. An acute radiation dose.
- d. A somatic radiation dose.

9. Federal packaging and labeling regulations regarding radioactive material are such that the probability of an emergency responder receiving an ACUTE dose of radiation during response to a transportation incident is extremely:

- a. Probable.
- b. Low.
- c. High.
- d. Likely.

10. The doses we receive every day from natural background radiation and the doses received by people who work in nuclear and medical facilities are examples of:

- a. A large radiation dose.
- b. Heritable radiation doses.
- c. Stochastic radiation doses.
- d. Chronic radiation doses.

11. Inhalation, ingestion, injection, and absorption are all methods by which:

- a. The body removes poisons.
- b. Radioactive material enters the body.
- c. Somatic effects are identified.
- d. Radiation enters the body.

12. The potential health effects from exposure to radiation depend on how much radiation you receive and how fast you receive the dose.

- a. True.
- b. False.

13. Not all radioactive material packages require package markings.

- a. True.
- b. False.

14. Which of the following would NOT be found, as a package marking, on a radioactive material package?

- a. UN identification number.
- b. "Type A" or "Type B."
- c. Contamination levels.
- d. Orientation arrows.

15. Which of the package labels below would indicate the lowest external radiation hazard?

- a. Radioactive White-I.
- b. Radioactive Yellow-II.

c. Radioactive Yellow-III.

16. The standard placard for radioactive material is yellow on top and white on bottom with black lettering and a black radiation symbol in the yellow portion.

- a. True.
- b. False.

17. The Number “7” on the standard placard for radioactive material denotes:

- a. 7 times normal background radiation.
- b. The DOT hazard classification for radioactive material.
- c. The pH of the enclosed material.
- d. The number for hazard severity.

18. When dealing with radioactive material, the correct response guide in the Emergency Response Guidebook can be identified by using which of the following:

- a. UN Identification number.
- b. Proper shipping name.
- c. Shipment placards.
- d. All of the above.

19. The Emergency Response Guidebook (ERG) states that “medical problems take priority over radiological concerns.”

- a. True.
- b. False.

20. Which of the package types below is designed to transport material with the lowest levels of radioactivity?

- a. Type A packaging.
- b. Type B packaging.
- c. Intense packaging.
- d. Excepted packaging.

21. Type A packages contain potentially life-endangering amounts or radioactive material.

- a. True.
- b. False.

22. Type B packages must withstand a series of tests which simulate severe or “worst case” accident conditions.

- a. True.
- b. False.

23. Most radioactive material shipments involve small quantities of radioactive material that have been packaged in Industrial or Type A packages. These containers pose minimal risk to the First Responder.

- a. True.

b. False.

24. A patient who has only been exposed to radiation from an external source should be handled as follows:

- a. Made comfortable and provided with last rites while next of kin is notified.
- b. Thoroughly decontaminated and wrapped in sterile blankets prior to transport.
- c. No differently than a person who may have received radiation therapy or a person who has received a diagnostic X-ray.
- d. Left at the scene until qualified persons arrive to decontaminate.

25. When handling a potentially contaminated patient, which method below should be used to limit the spread of contamination?

- a. Patient should be wrapped in plastic, label as radioactive material, and left at the scene.
- b. Decontaminate patient by removing all of their outer clothing (gross decon).
- c. Induce vomiting just in case the patient got contamination in their mouth.
- d. Held inside the hot zone until the radiation authority can arrive.

26. The four basic types of ionizing radiation are:

- a. Alpha particles, gamma rays, microwaves, and X-rays.
- b. Alpha particles, beta particles, gamma rays, and neutron particles.
- c. Neutron particles, gamma rays, radar waves, alpha particles.
- d. Microwaves, gamma rays, radar waves, and X-rays.

27. Fissile Material is a material whose atoms are capable of nuclear fission (capable of being split).

- a. True.
- b. False.

28. What is the Transport Index (TI)?

- a. An index that can be used to identify hazardous materials.
- b. An index that can be used to identify transport companies.
- c. The maximum radiation level in mrem per hour 1 meter away from the package.
- d. The hazard class for the type of material being transported inside the package.

29. A sealed radioactive source used in radiography operations would be an example of a special form radioactive material.

- a. True.
- b. False.

30. The “rem” is a unit used to measure:

- a. Radioactive contamination.
- b. The number of nuclear decays that occur during a specific time.
- c. Rapid energy movement.
- d. Radiation exposure.

31. The curie (Ci), and becquerel (Bq), are units used to measure:
- Activity level.
 - Radiation dose rate.
 - Nuclear fission probability.
 - A package's Transport Index.
32. Contamination survey instruments are very sensitive and typically report results in counts per minute (CPM).
- True.
 - False.
33. Contamination survey instruments commonly read out in mrem/hour or rem/hour.
- True.
 - False.
34. Exposure rate survey instruments typically measure in mrem/hour or rem/hour.
- True.
 - False.
35. Which instrument type would be most beneficial to the responder when entering a field of radiation?
- A contamination survey instrument.
 - A Thermo detector.
 - An oxygen concentration meter.
 - An exposure rate survey instrument.
36. The object behind a radiation exposure rate survey is to identify sources of radiation and determine general radiation fields. This will be useful for establishing hot zone boundaries.
- True.
 - False.
37. When approaching the incident scene, the survey instrument should be set on the _____ scale.
- Highest.
 - Lowest.
 - x 10.
 - x 100.
38. While surveying with a contamination monitor, if you hear an increase in count rate. What should you do?
- Stop surveying, cover the area, leave, and wait for State Radiological Control Personnel to advise.
 - Pause for 5-10 seconds over the area to provide adequate time for instrument response.
 - Turn the contamination monitor up to the next scale and continue the survey.
 - Finish the survey with audible turned off to avoid distraction.

39. Dosimetry devices such as the Self-Reading Dosimeter (SRD) or Electronic Dosimeters can provide Responders with information concerning their total accumulated dose.

- a. True.
- b. False.

40. While working in the Hot Zone area you are using an SRD to track your dose. When you read your SRD, a higher than expected reading is indicated. What should you do?

- a. Notify the Incident Commander of the situation and continue working.
- b. Warn everyone to leave the area and decontaminate immediately.
- c. Perform a thorough radiation survey while your co-workers continue their tasks.
- d. Notify co-workers, have every-one in the area check their dosimeters, and exit the area immediately.

41. A Radioactive White-I label indicates that extremely _____ levels of external radiation can be expected.

- a. High.
- b. Low.
- c. Damaging.
- d. Risky.

42. For a Radioactive Yellow-II label, what is the maximum radiation level (in mrem/hour) on contact with the package?

- a. 0.5
- b. 50
- c. 200
- d. 10

43. If a radiation survey instrument is available, the transport index is a good initial indicator for determining whether or not damage has occurred to the package.

- a. True.
- b. False.

44. Under normal transport conditions, the maximum radiation level at any point on the outer surfaces or outer plane of a transport vehicle should not exceed 200 mrem/hour.

- a. True.
- b. False.

45. A good way to assess whether or not a package is externally contaminated is to:

- a. Perform a detailed radiation survey on the exterior of the package.
- b. Take a wipe or smear sample on the exterior of the package.
- c. Take a direct reading on the exterior of the package with a contamination survey instrument.
- d. Touch the package and see if it is warm.

46. Response personnel could potentially become contaminated with radioactive material by:

- a. Changing gloves after handling contaminated equipment or victims.
- b. Sleeving or wrapping equipment prior to entry into the hot zone.
- c. Eating, drinking or smoking in the hot zone.
- d. Not touching unprotected skin areas.

47. To avoid the need for decontamination of critical hand-held equipment, a common practice is to place equipment in clear poly bags then remove and dispose of the bag on exit from the contaminated area.

- a. True.
- b. False.

48. Many commonly shipped radioactive materials have very short half-lives. Rather than decontaminating items that may become contaminated with these materials, the items can be sealed in a bag and allowed to decay to a stable or non-radioactive state.

- a. True.
- b. False.

49. The preferred method for personnel decontamination (skin and/or other body surfaces) involves the use of:

- a. Mild soap and hot water.
- b. A soft brush and hot water.
- c. Abrasive cleaners and lukewarm water.
- d. Mild soap and lukewarm water.

50. It is not necessary to use the wet decon method to decontaminate everyone exiting the hot zone at a radioactive material transportation incident. Removing the outer layer of PPE or clothing will often eliminate the contamination. A contamination survey will determine if further decontamination is necessary.

- a. True.
- b. False.