

50 QUESTION RADIATION SAFETY PRACTICE EXAMINATION

THE FOLLOWING QUESTIONS ARE SIMILAR TO ONES WHICH WILL BE ASKED ON STATE RADIATION SAFETY EXAMS. PLEASE ATTEMPT TO ANSWER THESE QUESTIONS WITHOUT REFERENCING NOTES AND BOOKS. THE STATE EXAMS REQUIRE 70 PERCENT CORRECT RESPONSES TO PASS. IF YOU ARE NOT ABLE TO SCORE AT LEAST THAT ON THIS EXAM, YOU SHOULD CONTINUE YOUR STUDY. THESE QUESTIONS DO NOT COVER EVERY TOPIC TESTED. THIS EXAM IS A STUDY AID AND NOT INTENDED TO REPLACE OTHER STUDY MATERIAL.

1. A curie is a unit of
 - a. Activity
 - b. Radiation dose
 - c. Dose rate
 - d. Distance
2. The radiation dose may be reduced by
 - a. wearing a dosimeter badge
 - b. moving farther from the source
 - c. wearing an alarming dosimeter
 - d. using a shorter head nose
3. What must the operator do after each exposure?
 - a. perform a radiation survey
 - b. disconnect the pump or crank
 - c. disconnect the head hose
 - d. place the camera on the ground
4. Gamma rays have a shorter wavelength than light and heat; therefore, they are
 - a. non penetrating
 - b. very penetrating
 - c. very attenuating
 - d. very absorbing
5. Which of the following is more sensitive to radiation
 - a. unborn child
 - b. child
 - c. adolescent
 - d. adult
6. All operators should be familiar with their operating and emergency manual and if an emergency occurs the most important step to take is
 - a. contact local health authorities
 - b. contact your RSO/RPO
 - c. stop and think before acting
 - d. retrieve the source as fast as possible
7. The most common survey instrument used in isotope surveys is
 - a. Ion chamber
 - b. Scintillation counter
 - c. Geiger-Mueller

- d. Proportional counter
8. Chronic exposure is relatively low level exposure received over a long period of time
 - a. True
 - b. False
 9. A TVL (Tenth Value Layer) is the amount of shielding sufficient to
 - a. reduce the radiation emitted from the source by 10%
 - b. attenuate a beam of radiation to one-tenth its initial value
 - c. reduce the source strength by one-tenth
 - d. reduce the source strength to one-tenth its initial value
 10. In the event that an exposure device is stolen, the operator should immediately
 - a. notify the RSO/RPO
 - b. notify the fire department
 - c. notify the NRC
 - d. notify the local authorities
 11. In the event of a road accident that involves an exposure device where the survey meter is damaged, the operator should immediately
 - a. notify the responsible user and the AECB
 - b. notify the civil authorities of the possibility of radiation
 - c. assume the source is fully exposed and restrict and post the area
 - d. contact the responsible user for a new meter
 12. People and metal objects exposed to sealed radiography sources emitting gamma rays become radioactive:
 - a. True
 - b. False
 13. If the sealed source is damaged and it is suspected that it is leaking, the operator should immediately
 - a. cease all radiographic operations, and restrict the area
 - b. notify the local health authorities
 - c. continue to operate but measure and record leakage to report to the RSO/RPO
 - d. measure and record leakage and report to the NRC
 14. The sievert (Sv) replaces the rem and one sievert equals
 - a. 100 rem
 - b. 10 rem
 - c. 37 rem
 - d. 1 rem
 15. All radiation injuries result in death
 - a. True
 - b. False
 16. The reason for the use of 2 lithium fluoride chips (thin and thick) in the thermoluminescent dosimeters is:
 - a. measurement of skin and body dose
 - b. measurement of low and high dose
 - c. measurement of x-ray and gamma rays
 - d. none of the above

17. Effects of radiation that are evident in the individual are
 - a. somatic effects
 - b. genetic effects
 - c. generic effects
 - d. all of the above

18. Effects of radiation that are observed in the children of an individual who was exposed are:
 - a. somatic effects
 - b. genetic effects
 - c. generic effects
 - d. all of the above

19. 1 Roentgen per hour is approximately equal to:
 - a. 20mR per hour
 - b. 1 rem per hour
 - c. 10 rem per hour
 - d. 100 rem per hour

20. The three main factors to be considered in radiation protection are:
 - a. Shielding time and allowable dose
 - b. Time distance and shielding
 - c. Survey meter, TLD, and dosimeter
 - d. None of the above

21. Maximum allowable dose for adult radiographer is
 - a. 5 R per year
 - b. 3 rem per year
 - c. 500 millirem per year not to exceed 300millirem per quarter
 - d. 30 millirem per year not to exceed 50 mR per quarter

22. A HVL (Half Value Layer) is the amount of shielding sufficient to:
 - a. reduce the radiation emitted from the source by half
 - b. attenuate a beam of radiation to one half of its initial value
 - c. reduce the source size by 50%
 - d. reduce the source strength by 50%

23. A rem is a unit of:
 - a. Activity
 - b. Radiation dose
 - c. Dose rate
 - d. Source size

24. The source tag that is attached to the exposure device must be made of?
 - a. Aluminum
 - b. Steel or brass
 - c. Plastic
 - d. Paper

25. You are performing radiography on a bridge structure directly above a highway. Each shot will last 30 minutes and the dose rate at road level is 50mr/hour. What do you do?
 - a. stop traffic during the exposure
 - b. erect warning signs warning drivers of the presence of radiation

- c. retract the source each time a vehicle approaches
 - d. watch for any vehicle that stops in the area above 10 mR/h; if a car stops retract the source
26. You are operating an exposure device when you notice that your direct reading dosimeter goes off scale. What do you do?
- a. reset it to zero
 - b. continue working
 - c. stop work and contact RSO/RPO
 - d. go to the nearest hospital for a blood test
27. A gamma radiation survey meter must be suitable for measuring gamma radiation emitted by the source in use in the range of:
- a. 2 mR to 1 R within 20%
 - b. 20 mR to 1 R within 20%
 - c. 2 mR to 1 R within 10%
 - d. 2 R to 100 mR within 20%
28. What is the maximum dose rate allowable at the barriers?
- a. no greater than 10 mR per hour
 - b. no greater than 2 mR per hour
 - c. no greater than 20 mR per hour
 - d. no greater than 1 mR per hour
29. Direct reading dosimeters must be read at least
- a. Daily
 - b. After each shot
 - c. Weekly
 - d. Bi-weekly
30. weekly allowable dose of ionizing radiation received from radiography operations by the general public is:
- a. 0.1 millisievert
 - b. 0.5 millisievert
 - c. 1 millisievert
 - d. 10 microsieverts
31. What is the maximum permissible quarterly whole body dose for a radiation worker?
- a. 3R
 - b. 2.5R
 - c. 300mR
 - d. 250mR
32. If you pass this examination, will you be
- a. a certified radiographer
 - b. a radiation safety officer
 - c. a trainee supervisor
 - d. qualified to work as a radiographer trainee
33. A survey meter must be used

- a. at the end of the day to ensure the source is properly shielded
 - b. each time the source is returned to the shielded position in the exposure device
 - c. each time the source is moved
 - d. all of the above
34. Leak tests on Cobalt-60 source must be performed
- a. once a year, and after any incident that may have damaged the source capsule
 - b. every six months
 - c. quarterly
 - d. every six months and after any incident that may have damaged the source capsule
35. What is the permissible annual whole body dose of radiation for the general public?
- a. 5 rem
 - b. 50 rem
 - c. 0.5 rem
 - d. 0.05 rem
36. You are working on a job with a trainee assisting you. You need to buy some food at a nearby fast food outlet, and bring it back to the job site without interrupting the exposures, which are 1/2 hour's duration each. Which of the following is acceptable?
- a. You don't go for the food during radiographic operations
 - b. You send the trainee for the food
 - c. You both go for the food during one of the exposures with signs and barricades erected
 - d. You both go for food during one of the exposures
37. Licenses must be
- a. posted at place of business
 - b. posted in vehicles carrying radioactive materials
 - c. posted at all work sites
 - d. posted at the place of business and copies available at all work sites
38. Survey instruments must be calibrated at least:
- a. every month
 - b. every three months
 - c. once per year
 - d. when they become inoperable
39. Which one of the following items of equipment is most important from the point of view of radiation safety:
- a. emergency tongs
 - b. radiation warning signs
 - c. survey meter
 - d. safety manual

40. You must not operate an exposure device if the dose rate on its surface exceeds:
- 50 milliroentgen per hour at six inches
 - 100 milliroentgen per hour at six inches
 - 200 milliroentgen per hour at the surface
 - 1000 milliroentgen per hour at the surface
41. An alarming dosimeter (e.g. "RAD TACT") is an acceptable alternative to a survey meter
- True
 - False
42. The use of 3 tenth value layers of shielding will reduce the radiation intensity by a factor of:
- 9
 - 30
 - 1000
 - 3000
43. the dose rate from a gamma source is 100 mR/h at 12 feet, what is the approximate dose rate at 9 feet
- 200 mR/hr
 - 177 mR/hr
 - 120 mR/hr
 - 250 mR/hr
44. If a Cobalt-60 source has an activity of 10 Ci initially, what is its approximate activity 10 years later?
- 5 Ci
 - 2.5 Ci
 - 20 Ci
 - 4 Ci
45. What is the radiation intensity at 30 feet from an unshielded 60 Ci Iridium-192 source?
- 360 mR/hr
 - 330 mR/hr
 - 36 mR/hr
 - 660 mR/hr
46. The use of 3 half value layers of shielding will reduce the radiation intensity by a factor of:
- 4
 - 8
 - 3
 - 6
47. What is the radiation intensity at 6 feet from an unshielded 60 Ci Iridium-192 source?
- 91.6 mR/h
 - .916 mR/h
 - 916 mR/h
 - 196 mR/h
48. If the tenth value layer of lead for Cobalt-60 gamma rays is 1.5 inches, and the dose rate from an unshielded cobalt source is 2 R/h, what is the thickness of the lead shielding required to reduce the dose rate to 20 mR/h:

- a. 1.5 inches
- b. 3 inches
- c. 5 inches
- d. 4 inches

49. If an Iridium-192 source has an activity of 12 Ci after 150 days, what was its approximate initial activity:

- a. 50 Ci
- b. 25 Ci
- c. 35 Ci
- d. 48Ci

50. If the radiation intensity at 6 feet from an unshielded Iridium-192 source is 5 mR/h, what is the approximate activity of the radioisotope:

- a. 0,327 Ci
- b. 32.7 Ci
- c. 327 Ci
- d. 3.27 Ci