Radiation Safety and XRF technology Evaluation

Name: _____ Date: _____

Company: _____

Address: _____

_____

Please answer the following questions:

1. True or False. Radiation is a form of energy.
2. True or False. X-rays are electromagnetic radiation.
3. True or False. X-ray energy is a function of its frequency.
4. True or False. Microwaves are considered to be ionizing radiation.
5. A radioactive material is any material/element that is:
   A. Unstable
   B. Disintegrating
   C. Emitting radiation
   D. All of the above
6. True or False. Half-life is the amount of time that it will take for a radioactive material to decay to half of its original strength.
7. True or False. Radioactive decay is a constant process.

Please choose the correct definition:

8.1 Byproducts are: _____

8.2 NARMS are: _____

   A. Radioactive materials made in a reactor.
   B. Radioactive materials made in accelerators.
   C. Radioactive materials made for XRF application.
   D. Radioactive materials used in medical field.

9.1 True or False. Curie and Becquerel are both units of radioactivity.

9.2 True or False. The unit of energy used for radiation is kilowatt.

10. True or False. All types of radiation deposit energy to the body and any media as they go through.
11. True or False. Alpha rays penetrate into our skin deeper than x-rays.
12. The radiation absorption per unit mass is called: _____
    A. Dose B. Dose Rate C. Dose Equivalent
13. The unit for Dose equivalent is:
    A. Erg B. Rad C. Rem
14. True or False. The International unit (SI) for Dose is RAD.
15. True or False. Obtaining a radioactive source or a device containing one requires a license or a registration in most States.
16. True or False. It is OK to transfer a device containing a radioactive material across the Sates lines without notification and reciprocity license.
17. True or False. Radiation regulations are published in 10CFR20.
18. The whole body Maximum Permissible Dose (MPD) for an Occupational Exposure Individual in one year is:
    A. 5 Rem B. 500 mRem C. 50 Rem
19. True or False. Radiation causes ionization of the body's cells.
20. True or False. A film badge is an active device.

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21. True or False. It is Ok to store your badge in the XRF case.
22. True or False. It is Ok to loan the XRF to a person who is not licensed.
23. True or false. It is Ok to sell your XRF to a person who does not possess a license.
24. Radiation drops in intensity as a function of:
    A. Time B. Distance C. Inverse Square of distance
25. The factors that influence radiation exposure are:
    A. Time
    B. Shielding
    C. Distance
    D. All of the above
26. True or False. Transportation of radioactive materials in the US is regulated under 49CFR.
27. True or False. Radioactive materials are considered Category 7 hazardous materials.
28. Packaging category of a package containing a radioactive material is a function of:
    A. The source Activity and measured dose at the surface of the package
    B. State regulations
    C. The labels used for the package
    D. Dangerous good declaration
29. The _____ is in charge of enforcing the transposition of radioactive materials.
    A. Nuclear Regulatory Commission
    B. Department of Energy
    C. Department of Transportation
30. True or False. All States' regulation for storage and safe keeping of a device when in transit are the same.
31. The LPA-1 or LTR-1000 XRF system shipping package category is:
    A. Radioactive level II
    B. Excepted package
    C. Declared package
32. True or False. DOT requires training and certification for shipping a device containing a radioactive material.
33. XRF is:
    A. Continuous x-rays
    B. Characteristic x-rays
    C. Medical x-rays
34. True or False. K-shell x-rays have higher energy than L-shell x-rays.
35. Substrate problem in XRF technique is due to:
    A. Bad detector
    B. Compton Scattering
    C. Paint Density
36. True or False. L-shell x-rays of lead can be influenced by the interference from other constituents in paint.
37. True or False. One can perform exact measurements of lead in paint by XRF and other lab methods without any variation.
38. True or False. 95% confidence level means a 2 Sigma variation range around a measured lead value.
39. True or false. XRF is a comparative technique and requires calibrating standards.
40. True or False. A XRF device's source should be disposed by qualified manufacturer.