

Environmental Health & Safety

New Mexico State University

MSC 3578, Box 30001

Las Cruces, NM 88003-8001

**Score**

(For EH&S use only)

**NMSU Analytical X-Ray Exam**

**Instructions:** To receive credit, complete the following exam. Please email the exam to the Radiation Safety Manager at dschoep@nmsu.edu, or you may send the exam via campus mail to Radiation Safety, MSC 3578. Please check [Training Central](https://trainingcentral.nmsu.edu/Saba/Web/Main) for your score. **To pass the exam you must score 80% or higher**. This is an “open-book” exam meaning you can use any reference materials you choose including the NMSU Radiation Safety Manual.

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| --- | --- |
| **Name:**  | **Email:**   |
| **Department:**  | **Date:**  |
| **AGGIE ID #:**  | **Authorized User/****URSC Permit Holder:**  |

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1. Are x-rays considered directly or indirectly ionizing radiation?

[ ]  a. Directly

[ ]  b. Indirectly

2. Gamma rays and x-rays are distinguished primarily by where they originate.

[ ]  a. True

[ ]  b. False

3. Radiation levels near the exterior of the x-ray cabinet must be below millirem per hour.

[ ]  a. 25

[ ]  b. 2.5

[ ]  c. 0.25

[ ]  d. 500

4. Standard Operating Procedure (SOP) must be written and available to x-ray operators.

[ ]  a. True

[ ]  b. False

5. The **NMSU administrative control dose** limit for the whole body is:

[ ]  a. 5 mrem per hour

[ ]  b. 500 mrem per year

[ ]  c. 5000 mrem per year

[ ]  d. 50,000 mrem per year

6. The **NMSU administrative control dose** limit for extremities is:

[ ]  a. 5 mrem per hour

[ ]  b. 500 mrem per year

[ ]  c. 5000 mrem per year

[ ]  d. 50,000 mrem per year

7. What is the largest contributor of background radiation to the general public?

[ ]  a. Cosmic radiation

[ ]  b. Nuclear medicine

[ ]  c. Radon gas

[ ]  d. Medical x-rays

8. One method for reducing external exposure from an x-ray source is to:

[ ]  a. Minimize the distance between you and the x-ray

[ ]  b. Minimize the amount time spent near the x-ray

[ ]  c. Minimize the amount of shielding used around the x-ray

9. X-rays are different from many other types of electromagnetic radiation because x-rays are

[ ]  a. electrons

[ ]  b. ionizing

[ ]  c. nonionizing

[ ]  d. atoms

10. Which of the following type of radiation is the most similar to x-rays?

[ ]  a. microwaves

[ ]  b. infrared

[ ]  c. ultraviolet

[ ]  d. gamma rays

11. A primary purpose of posting areas where x-rays are located is to:

[ ]  a. prevent workers from entering radiological areas

[ ]  b. inform workers of the radiological conditions in the area

[ ]  c. allow EHS Radiation Safety personnel to measure the dose

[ ]  d. eliminate all occupational doses at NMSU

12. Ionizing radiation causes damage to living tissues is by the breaking chemical bonds, producing free radicals and the production of new chemical bonds which can form new, potentially toxic chemical compounds.

[ ]  a. True

[ ]  b. False

13. One of the first visible signs that a worker was exposed to a high dose of x-rays is:

[ ]  a. loss of hair

[ ]  b. cancer

[ ]  c. nausea

[ ]  d. reddening of the skin

14. Acute effects from radiation exposures occur in a period; chronic effects occur over a period.

[ ]  a. long, longer

[ ]  b. long, short

[ ]  c. short, long

[ ]  d. short, short

15. Which of the following is classified as an analytical x-ray system at NMSU?

[ ]  a. x-ray diffraction system

[ ]  b. medical radiography x-ray machine

[ ]  c. industrial radiography machine

[ ]  d. none of the above

16. The maximum radiation dose limit measured 5 cm from the x-ray shutter is:

[ ]  a. 2.5 mrem / hour

[ ]  b. 0.5 mrem / hour.

[ ]  c. 25 mrem / hour

[ ]  d. 5 mrem / hour

17. Generally, x-ray systems require all of the following, except

[ ]  a. warning lights

[ ]  b. shielding

[ ]  c. weekly dose rate surveys

[ ]  d. interlocks

18. “Soft x-rays” are hazardous because they are easily absorbed by soft tissues.

[ ]  a. True

[ ]  b. False

19. Who is responsible for students or visitors in an area where an x-ray is operating?

[ ]  a. Department Chair

[ ]  b. Radiation Safety Officer

[ ]  c. College Dean

[ ]  d. X-ray operator

20. Are radiation induced cancers an example of a prompt effect or a delayed effect?

[ ]  a. Prompt

[ ]  b. Delayed

21. Bypassing built-in equipment interlocks or safety devices is not allowed unless approved in writing by the NMSU RSO.

[ ]  a. True

[ ]  b. False

22. Dose rate surveys must be performed:

[ ]  a. Upon installation of the equipment and at least every twelve months thereafter.

[ ]  b. Following any change in the number, type, or arrangement of components in the system.

[ ]  c. Following any maintenance requiring the disassembly or removal of a system component.

[ ]  d. All the above

[ ]  e. None of the above