

1 Exam Prep

NFPA 99 Health Care Facilities

Questions and Answers

Part 1

1. A bulk nitrous oxide system has a storage capacity of _____ of nitrous oxide at normal temperature and pressure.

- A 3,200 pounds
- B More than 3,200 pounds
- C 29,000 feet
- D More than 29,000 feet

2. A hypobaric structure is used to house chambers and all auxiliary service equipment for medical applications and procedures?

- A That are affected by subtle changes in atmospheric pressure
- B At pressures below atmospheric pressures
- C At pressures above normal atmospheric pressures
- D At pressures that deviate from normal atmospheric pressures

3. No flammable materials, cylinders containing flammable gases or containers containing flammable liquids shall be stored?

- A Within the main facility of any commercial building
- B Within medical buildings
- C In rooms with gas cylinders
- D In rooms with medical gas cylinders

4. Cylinders in use and in storage shall be prevented from reaching temperatures in excess of?

- A 130 degrees Fahrenheit
- B 120 degrees Fahrenheit
- C 55 degrees Celsius
- D 50 degrees Celsius

5. Tubes used in medical gas systems shall be hard-drawn seamless copper ASTM B 819 medical gas tube, Type?

- A L
- B L or K
- C K or M
- D M

6. ASTM B 819 medical gas tube must be identified?

- A By the manufacturer's markings
- B By the universal identifiers "OXY", "MED", or "ACR/MED"
- C By the colors blue or green
- D By the manufacturer's markings in blue (Type L) or green (Type K)

7. Drops to individual station outlets and inlets in medical-surgical piping systems shall be not less than _____ size.

- A DN15
- B DN20
- C 3/80.D
- D 7/8 0.D

8. The minimum backfilled cover above the top of the enclosure for buried piping outside of a health care facility shall be _____ inches, where physical damage is otherwise prevented.

- A 36
- B 30
- C 24
- D 18

9. When pressure testing a medical gas or vacuum system, the test pressure?

- A Shall equal the system working pressure
- B Shall be not less than 150 PSI gauge
- C Is the standard measure
- D Shall be 1.5 times the working pressure but not less than 150 PSI gauge

10. A medical gas or vacuum system is verified by testing conducted by a _____ in the field of medical gas and vacuum pipeline testing.

- A Technician trained
- B Competent party
- C Party technically competent and experienced
- D Supervisor or manager trained

11. Where natural ventilation is permitted for enclosures for medical gas systems, louvered openings shall each have a total minimum free area of _____ inches ?

- A 5,184 inches
- B 10,368 inches
- C 20,736 inches
- D 72 inches

12. Where multiple pumps discharge through a common pipe in a medical piping system, each pump shall be?

- A Fitted with a check valve
- B Fitted with a manual isolation valve
- C Arranged to permit capping the individual pump exhausts when a pump is removed for service
- D Fitted with a check valve, a manual isolation valve, or arranged to permit capping the individual pump exhausts when a pump is removed for service

13. Flared and compression joint connections are prohibited throughout _____ medical gas pipeline systems.

- A Category 1 only
- B Category 2 only
- C Category 3
- D Category 2 or 3 only

14. Unions are prohibited throughout _____ medical gas pipeline systems.

- A Category 1 only
- B Category 2 only
- C Category 3
- D Category 2 or 3 only

15. A bulk nitrous oxide system is a storage facility of more than how many pounds?

- A 2,500
- B 3,200
- C 5,000
- D 7,500

16. When the facility, building or structure used to house chambers and all auxiliary service equipment for medical applications and procedures are at pressures below atmospheric pressure, the system is?

- A Hypobaric
- B Hyperbaric
- C Schizophrenic
- D Paranoid

17. In Category 1 systems, vacuum tubes shall be?

- A Soft-drawn seamless copper Type L, K or M ASTM B88 water tube
- B Hard-drawn seamless copper Type L, K, or DVW ASTM B88 water tube
- C Seamless copper Type L, K, or M ASTM B88 water tube
- D Hard-drawn seamless copper Type L, K, or M ASTM B88 water tube

18. There will be no chance of damage to the piping. The minimum backfill required is?

- A 18 feet
- B 30 inches
- C 1.5 feet
- D 3 feet

19. Category 1 standing pressure test for vacuum systems shall have a test pressure not less than?

- A 12 mm gage HgV
- B 300 mm gage HgV
- C 300 in. gage HgV
- D 12 in. gage VgH

20. All positive pressure central supply systems shall be provided with what type of regulators?

- A Duplex final line
- B Simplex 4HB 75E's
- C Integrated compound
- D Spring loaded

21. The number of headers required for oxygen manifold without reserve supply is?

- A 1
- B 2
- C 3
- D 4

22. Medical gas system alarms shall indicate if the vacuum pressure increases or decreases?

- A 20%
- B 25%
- C 30%
- D 50%

23. The maximum allowable pressure drop for the end of a vacuum system is what gauge Hg?

- A 25
- B 20
- C 15
- D 12

24. Exterior end of tubes shall be cleaned using?

- A Dry nitrogen
- B Shedding abrasive pads
- C Steel wool or sand cloth
- D Non-shedding abrasive pads

25. The ambient temperature surround WG medical gas piping is limited to?

- A 150 degrees F
- B 130 degrees F
- C 100 degrees C
- D 54 degrees F

26. The number of headers required for oxygen manifold with reserve supply is?

- A 1
- B 2
- C 3
- D 4

27. A facility, building or structure used to house chambers and all auxiliary service equipment for medical applications and procedures at _____ is termed "hypobaric".

- A Pressures above atmospheric pressures
- B Pressures below atmospheric pressures
- C Sea level
- D Abnormal pressures

28. Before vacuum exhausts from multiple pumps can be joined together to one common exhaust?

- A They must be cleaned thoroughly
- B The common exhaust must be sized to maximize pressure
- C Each pump must be capable of being isolated by manual or check valve, blind flange, or tube cap
- D The pump manufacturer(s) must condone or recommend such action

29. Joints prohibited throughout medical gas and vacuum distribution pipeline systems include?

- A Unions
- B Brazed joints
- C Special fittings
- D Couplings

30. The minimum backfilled cover above the top of an enclosure for buried piping (outside a building) can be reduced to _____ inches, if physical damage can be otherwise prevented.

- A 24
- B 18
- C 16
- D 12

31. When conducting a standing vacuum test on vacuum distribution piping, the test pressure must be no less than _____ inches gage HgV.
- A 10
 - B 11
 - C 12
 - D 13
32. Piping purity tests conducted on medical gas and vacuum piping systems must be performed with oil-free?
- A Compressed dry oxygen CO or the gas of system designation
 - B Compressed dry oxygen CO, the gas of system designation or the operating vacuum
 - C Dry Nitrogen NF or the gas of system designation
 - D Dry Nitrogen NF, the gas of system designation or the operating vacuum
33. Facilities that manage the existing inpatient or outpatient loads but do not plan to receive additional patients as a result of an emergency are?
- A Satellite Emergency Departments
 - B Category 2
 - C Under staffed
 - D Category 1
34. A bulk nitrous oxide system has a storage capacity of more than _____ pounds of nitrous oxide, at normal temperature and pressure.
- A 2,900
 - B 3,000
 - C 3,100
 - D 3,200
35. Gas and vacuum cylinders in use and in storage must be prevented from reaching temperatures in excess of _____ degrees Fahrenheit.
- A 125
 - B 130
 - C 135
 - D 140
36. Vacuum tubes (in gas or vacuum systems) can be ASTM B tube.
- A 288 ACR
 - B Type K, L or N
 - C 88 water
 - D 820 medical gas

37. Mains and branches in medical-surgical vacuum systems must not be less than inch (O.D.) size.

- A 1/2
- B 3/4
- C 5/8
- D 7/8

38. The test pressure for pressure gases in gas and vacuum systems must be times the system working pressure, but not less than a gage pressure of 150 psi.

- A 1.25
- B 1.50
- C 1.75
- D 2.00

39. Tests on vacuum distribution piping must be conducted by a(n) _____ in medical gas and vacuum pipeline testing. he field of

- A Technician who is certified
- B OSHA inspector who is certified
- C Licensed contractor who has experience
- D Party technically competent and experienced

40. Natural ventilation for medical gas supply systems must consist of two louvered openings, each having a minimum free area of _____ inches, squared.

- A 72
- B 84
- C 96
- D 108

41. Facilities that remain operable to provide advanced life support service to injured responders and disaster victims are?

- A Few and far between
- B Category .1
- C Understaffed
- D Category 2

42. Factory-installed copper inlet tubes on station outlets shall extend no farther than how many inches from the body of the terminal when the copper tube is 3/8 inches OD or greater?

- A 3
- B 5
- C 8
- D 12

43. A bank of cylinders is commonly referred to as a/an _____?

- A Header
- B Compound
- C Cluster
- D Manifold

44. Openings in Medical Gas Rails not occupied by station outlets/inlets shall be capped or plugged so that a _____ is required for removal?

- A Torch
- B Blowgun
- C Vice grip
- D Special tool

45. Category 1 systems under a cross-connection test shall be charged with oil-free dry nitrogen to a gauge pressure of how many psi?

- A 30
- B 50
- C 75
- D 100

46. At the conclusion of a Category 3 initial standing pressure test for positive-pressure gas piping the vacuum shall not have reduced to less than _____ PSI.

- A 3
- B 5
- C 10
- D 25

47. Factory-installed copper inlet tubes on station inlets shall extend no farther than 8 inches from the body of the terminal if the OD is how many inches or greater?

- A 1
- B 3/4
- C 1/2
- D 1/4

48. Manifolds shall consist of at least how many equal headers?

- A 1
- B 2
- C 3
- D 4

49. Tests shall be conducted by?

- A Qualified technicians
- B Building inspectors
- C Authorized inspectors
- D A party other than the installing contractor

50. Nitrous Oxide when stored in quantities greater than _____ are considered bulk nitrous oxide systems.

- A 3,000 pounds
- B 4,000 pounds
- C 28,000 square feet
- D 28,000 cubic feet

51. Storage rooms for medical gases when made of construction materials shall have a fire rating of at least how many hours?

- A 1
- B 2
- C 3
- D 4

52. Where Category 1 vacuum exhausts from multiple pumps are used, which of the following should not be used?

- A Manual valves
- B Check valves
- C Blind flanges
- D Flow meters

53. Category 3 vacuum piping shall not be tested with compressed gas when made of?

- A PVC
- B Copper
- C Steel
- D Metal

54. Compressor intakes shall be located at least how many feet above the ground?

- A 5
- B 10
- C 15
- D 20

55. Openings for future use in medical gas rails shall be capped or plugged requiring the use of?

- A Pliers
- B A screwdriver
- C Special tool
- D A torch

56. Where underground piping is installed through a wall, the ends of the sleeve shall be?

- A Tapered
- B Sealed
- C Crimped
- D Locked

57. Surgical vacuum exhausts shall be located at all of the following except?

- A Outdoors
- B At a level higher from air intakes
- C At least 10 feet from any window
- D Where topography would not divert the exhaust into occupied areas

58. Chambers for medical applications and procedures at pressures below atmospheric pressure are facilities.

- A Hyperbaric
- B Hypobaric
- C Category 1
- D Category 3

59. When cleaning exterior surfaces of tube ends, use?

- A Steel wool
- B Hot soapy water
- C Clean, non-shedding abrasive pads
- D Dry nitrogen

60. Category 1 piping systems shall be subject to a standing vacuum test for hours?

- A 12
- B 24
- C 32
- D 48

61. A work space room for Category 1 installations shall have a fire resistance rating of how many hours?

- A 1
- B 2
- C 3
- D 4

62. After brazing, all joints shall be cleaned on the outside with?

- A Ammonia
- B Dry nitrogen
- C Steel wool
- D Water and a wire brush

Part 2

1. According to *NFPA 99 Health Care Facilities*, fire originating in or involving inhalation anesthesia apparatus generally involves combustibles such as _____.

- A. Plastic
- B. Rubber
- C. Nylon
- D. Rayon

2. According to *NFPA 99 Health Care Facilities*, the pressure relief valve, set at _____ above normal line pressure, should be tested to assure proper function prior to use of the system for patient care.

- A. 25%
- B. 40%
- C. 60%
- D. 50%

Note: Not found in 2012 Edition

3. According to *NFPA 99 Health Care Facilities*, which of the following statements is false with regard to surface mounted medical gas rail assemblies?

- A. Assemblies shall be entirely visible.
- B. Openings for station outlet assemblies shall be gas-specific.
- C. Assemblies shall be made of materials with a melting point at least 550°C.
- D. Station outlets or inlets shall not be placed on the ends of medical gas rails assemblies.

4. According to *NFPA 99 Health Care Facilities*, when installing gas and vacuum systems, the joints being brazed shall be continuously purged with _____ to prevent the formation of copper oxide on the inside surface of the joint.

- A. Nitrogen
- B. Flux
- C. Dry flux
- D. Oil free dry nitrogen NF

5. According to *NFPA 99 Health Care Facilities*, brazed joints shall be visually examined after cleaning of the outside of the joint. Which of the following is not true concerning joints that are found to be defective?

- A. A joint must be replaced if there are cracks in the component.
- B. A joint may be repaired no more than twice.
- C. A joint maybe repaired if there is flux residue.
- D. A joint must be replaced if excessive oxidation of the joint is found.

6. According to *NFPA 99 Health Care Facilities*, a device used for producing an aerosol of water and/or medication within inspired gas supply is known as a (an)_____.

- A. Manifold
- B. Oxidizer
- C. Nebulizer
- D. Isolator

7. According to *NFPA 99 Health Care Facilities*, where bulk system cryogenic reserved vessels are used; they shall include a means to conserve the gas produced by the evaporation of cryogenic liquid in the reserve vessel and discharge the gas into the line upstream of the _____ assembly.

- A. Final line filtering system
- B. Final line regulator
- C. Check valve
- D. Manifold header

8. According to *NFPA 99 Health Care Facilities*, medical dew point high alarm from each compressor site for master alarm system be monitored and alarmed to indicate the line pressure dew point above_____.

- A. +32°
- B. +35°
- C. +39°
- D. +43°

9. According to *NFPA 99 Health Care Facilities*, ventilation for central systems and storage of less than 3,000 cu. ft. total capacity shall be vented outside. If natural venting is used the vent opening(s) shall be a minimum of _____ in total free area.

- A. 65 sq. in.
- B. 72 sq. in.
- C. 85 sq. in.
- D. 85 m

10. According to *NFPA 99 Health Care Facilities*, when flow testing outlets, oxygen, nitrous oxide, and air outlets shall deliver 3.5 SCFM with a pressure drop of no more than _____psig.

- A. 2
- B. 3
- C. 4
- D. 5

11. According to *NFPA 99 Health Care Facilities*, essential electrical emergency lighting in limited care facilities shall be capable of providing_____ foot candles to exits.

- A. 1
- B. 5
- C. 50
- D. 100

Note: Not found in 2012 Edition

12. According to *NFPA 99 Health Care Facilities*, The minimum ventilation rate for a class A chamber shall be _____ actual cubic feet per minute per occupant.

- A. 1
- B. 2
- C. 3
- D. 4

13. According to *NFPA 99 Health Care Facilities*, NFPA 99B refers to _____.

- A. Hazardous Chemicals Data
- B. Standard for Hypobaric Facilities
- C. Life Safety Code
- D. Health Care Facilities

14. According to *NFPA 99 Health Care Facilities*, which of the following agents is nonflammable?

- A. Cyclopropane
- B. Ethyl Chloride
- C. Fluroxene
- D. Enflurane

15. According to *NFPA 99 Health Care Facilities*, medical gas cylinders of style M contain _____cubic inches.

- A. 293
- B. 1337
- C. 2370
- D. 2660

16. According to *NFPA 99 Health Care Facilities*, silk, wool, or synthetic textile materials, except _____ , shall not be permitted in flammable anesthetizing locations unless electrostatic safeguard are in place.

- A. Rayon Note: Not found in 2012 Edition
- B. Nylon
- C. Teflon
- D. Polyester

17. According to *NFPA 99 Health Care Facilities*, Class B fires involve flammable liquids and should be fought with a fire extinguisher marked and identified with a _____.

- A. Square or blue square Note: Not found in 2012 Edition
- B. Square or yellow square
- C. Square or green square
- D. Square or red square

18. According to *NFPA 99 Health Care Facilities*, if electrical life support equipment is required for other health care facilities, the essential electrical distribution system shall conform to a _____ system.

- A. Type 1 Note: Not found in 2012 Edition
- B. Type 2
- C. Type 3
- D. Type 4

19. According to *NFPA 99 Health Care Facilities*, back up battery powered lights in nursing homes shall be effective for at least _____ hour(s).

- A. 1 Note: Not found in 2012 Edition
- B. 1.5
- C. 2
- D. 2.5

20. According to *NFPA 99 Health Care Facilities*, many substances, when subjected to a fire, undergo chemical changes resulting in a new toxic product. This is especially true of many _____ substances.

- A. Galvanized Note: Not found in 2012 Edition
- B. Pressure treated
- C. Plastic
- D. Metal

21. According to *NFPA 99 Health Care Facilities*, sustained skin contact with surfaces of equipment that have temperatures in excess of _____ can cause burns.

- A. 100°F Note: Not found in 2012 Edition
- B. 107°F
- C. 117°F
- D. 120°F

22. According to *NFPA 99 Health Care Facilities*, precautionary signs for cylinders and container storage shall be readable from a distance of _____ .

- A. 30 feet
- B. 20 feet
- C. 10 feet
- D. 5 feet

23. According to *NFPA 99 Health Care Facilities*, electrical equipment in an oxygen enriched atmosphere shall not have hot surfaces over _____ .

- A. 545°F
- B. 555°F
- C. 573°F
- D. 583°F

24. According to *NFPA 99 Health Care Facilities*, travel distance between any point in a laboratory unit and an exit access door shall not exceed _____.

- A. 100 feet
 - B. 75 feet
 - C. 50 feet
 - D. 25 feet
- Note: Not found in 2012 Edition

25. According to *NFPA 99 Health Care Facilities*, the purpose of NFPA 99 is to establish criteria to minimize the hazards of _____.

- A. Fire
 - B. Explosion
 - C. Electricity
 - D. All of the above
- Note: Not found in 2012 Edition

26. According to *NFPA 99 Health Care Facilities*, pressures above 200 PSIG are called _____.

- A. Hypobaric
- B. Vacuum
- C. Ambient
- D. High

27. According to *NFPA 99 Health Care Facilities*, electrical wiring fixed systems of _____ volts or less shall be ungrounded.

- A. 30
- B. 20
- C. 10
- D. 0

28. According to *NFPA 99 Health Care Facilities*, the component of impedance contributed by inductance or capacitance is known as _____.

- A. Endotrache
- B. Detonation
- C. Ampacity
- D. Reactance

29. According to *NFPA 99 Health Care Facilities*, the lowest ignition temperature in air of any of the anesthetic agents mentioned in Appendix C is _____.
- A. Trichloroethylene
 - B. Chloroform
 - C. Isoflurane
 - D. Diethyl ether
30. According to *NFPA 99 Health Care Facilities*, all brazed joints should have a brazing alloy exhibiting a melting temperature in excess of _____ to retain the integrity of the piping system in the event of fire exposure.
- A. 800°F
 - B. 900°F
 - C. 1000°F
 - D. 360°F
31. According to *NFPA 99 Health Care Facilities*, after installing a vacuum system, it must have a standing pressure test for _____.
- A. 12 hours
 - B. 24 hours
 - C. 36 hours
 - D. 48 hours
32. According to *NFPA 99 Health Care Facilities*, when storing cylinders or compressed gases, the temperature of the cylinders shall not exceed _____.
- A. 120°F
 - B. 130°F
 - C. 135°F
 - D. 145°F
33. According to *NFPA 99 Health Care Facilities*, the piping purity test performed on medical air piped gas systems cannot have a variation of more than _____ for Halogenated Hydrocarbons.
- A. 1 PPM
 - B. 2 PPM
 - C. 5 PPM
 - D. 10 PPM

1 Exam Prep

NFPA 99 Health Care Facilities

Answers

<u>Part 1</u>	<u>2005</u>	<u>2012</u>
1	B	3.3.19.1
2	B	3.3.75
3	D	5.1.3.2.4
4	A	5.1.3.3.1.7
5	B	5.1.10.1.4
6	C	3.3.118
7	A	5.1.10.10.1.4
8	D	5.1.10.10.5.5
9	D	5.1.12.2.3.4, 5.3.12.2.3.5
10	C	5.1.12.3.1.3, 5.3.12.3.1.4
11	A	5.3.3.3.6.4
12	D	5.3.3.6.4.8
13	C	5.3.10.8.1(1)
14	C	5.3.10.8.1(2)
15	B	3.3.19.1
16	A	3.3.75
17	D	5.1.10.2.1
18	C	5.1.10.11.5.5
19	B	5.1.12.2.7.3
20	A	5.1.3.5.5.1
21	B	5.1.3.5.10.4(1)
22	A	5.1.9.3.2
23	D	5.1.9.3.3
24	D	5.1.10.4.3.5
25	B	5.1.10.11.3.3
26	C	5.1.3.5.11.5
27	B	3.3.7.9
28	C	5.1.3.7.7.5(2)
29	A	5.1.10.10

30	B		5.1.10.11.5.5
31	C		5.1.12.2.7.3
32	C		5.1.12.3.8.1
33	B		Table 12.3
34	D	3.3.19.1	3.3.21.2
35	B		5.1.3.3.1.7
36	C		5.1.10.2.1
37	D		5.1.10.11.1.3
38	B		5.1.12.2.3.4
39	D		5.1.12.3.1.3
40	A		9.3.7.5.2.1
41	B		Table 12.3
42	C		5.1.5.11
43	A		5.1.3.5.9
44	D		5.1.7.7
45	B		5.1.12.2.4.3
46	B		5.3.9.2.8.5
47	C		5.1.5.12
48	B		5.1.3.5.10.4
49	D		5.1.12.3.1.3
50	D		3.3.21.2
51	A		5.1.3.3.2(4)
52	D		5.1.3.7.7.5(2)
53	A		5.3.9.2.4.1
54	D		5.1.3.6.3.12
55	C		5.1.7.7
56	B		5.1.10.11.5.10*
57	B		5.3.8.3.11
58	B		3.3.79
59	C		5.1.10.4.3.5
60	B		5.1.12.2.7.2
61	B		5.1.3.3.2(4)
62	D		5.1.10.4.7.1

<u>Part 2</u>	<u>2005</u>	<u>2012</u>
1. B	Annex C 13.4.4.1	B.11.3.4
2. D	Annex C 5.1.1	N/A
3. C	5.1.7	5.1.7
4. D	5.1.10.5.5.1	5.1.10.4.5.1
5. B	5.1.10.5.7.6	5.1.10.4.7.6
6. C	3.3.118	3.3.116
7. B	5.1.3.4.13.8(5)	5.1.3.5.12.3
8. C	5.1.9.5.4(3)	5.1.9.5.4(3)
9. B	5.1.3.3.3.1(E)	9.3.7.5.2.1
10. D	5.1.12.3.10.2	5.1.12.3.10.2
11. A	18.3.4.2.2(3)	N/A
12. C	20.2.4.1.1	14.2.4.1.1
13. B	Annex G.1.1	D.1.1
14. D	Annex A.3.3.127	A.3.3.125
15. C	Table C.13.5	Table A.9.3.7.5.1
16. A	Annex E.6.6.10.4	N/A
17. D	Annex C.13.4.4.3.2	N/A
18. A	14.3.4.2.1	N/A
19. B	17.3.4.2.2(3)	N/A
20. C	Annex B.4.2	N/A
21. B	Annex B.5.3.1	N/A
22. D	9.4.4.1	11.3.4.1
23. C	10.2.9.3(4)(a)	10.5.4.1(4) a)
24. B	11.3.2.3	N/A
25. D	1.1.1	N/A
26. D	3.3.148.4	3.3.147.4
27. A	4.3.2.2.5(1)	6.3.2.2.5(1)
28. D	3.3.154	3.3.152
29. D	Annex C.13.1.3.3.4	N/A
30. C	5.3.10.7.1.1	5.1.10.4.1.3
31. B	5.1.12.2.6.3	5.1.12.2.6.3

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|-----|---|---------------------|---------------------|
| 32. | B | 5.1.3.3.1.7 | 5.1.3.3.1.7 |
| 33. | B | Table 5.1.12.3.12.3 | Table 5.1.12.3.12.3 |