

NC Well Contractors Certification Examination
Sample Questions

====Sample Questions (answers to follow)=====

1. How many hours of continuing education are required each year to be able to renew Level B certification when the well contractor has been certified less than 3 years?
 - a. 6
 - b. 8
 - c. 2
 - d. 0

2. A certification as a well contractor issued by the Commission *shall be valid*:
 - a. only in counties with well construction programs
 - b. only in counties you have registered with
 - c. in every county in the state
 - d. in North and South Carolina

3. An opening in the well casing or well head installed for the primary purpose of determining the position of the water level in the well or to facilitate disinfection is:
 - a. access port
 - b. well system
 - c. annular space
 - d. vent

4. What is the minimum amount of granular calcium hypochlorite required to disinfect a newly drilled 6" well that is 310 feet deep with a 30 foot static level? [a 6" diameter holds 1.5 gal/ft of water]
 - a. 9 ounces
 - b. 3 ounces
 - c. 13 ounces
 - d. 28 ounces

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5. A Closed-Loop Geothermal Well System is:
- a. A system of continuous piping, part of which is installed in the subsurface, through which moves a fluid that does not exit the piping, and which is used to transfer heat energy between the subsurface and the fluid.
 - b. A system and attendant processes used for improving the quality of contaminated groundwater by collecting or pumping groundwater, treating the groundwater to reduce the concentration of or remove contaminants, and reintroducing the treated water beneath the surface in such a manner that the treated groundwater will be recaptured by the collecting or pumping portion of the system.
 - c. Any excavation which is cored, bored, drilled, jetted, dug, or otherwise constructed, whose depth is greater than its largest surface dimension and which is used, or intended to be used, for the injection of fluids or solids into the subsurface or groundwaters.
 - d. Any well constructed for the primary purpose of obtaining samples of groundwater or other liquids for examination or testing, or for the observation or measurement of groundwater levels.
6. The purpose or function of a well seal is:
- a. to prevent hydrostatic collapse caused by the heat of hydration
 - b. to center the pump in the borehole
 - c. to maintain equilibrium hydrostatic pressure at the interstitial plane
 - d. to prevent pollutants from entering the well at the upper terminal
7. How is hypochlorous acid effected by pH?
- a. is more effective at higher pH levels
 - b. is effective only at a pH of 3-5
 - c. is less effective at higher pH levels
 - d. not effected by pH levels
8. A volatile organic chemical that may contaminate groundwater in areas around sources of gasoline or jet fuel:
- a. arsenic
 - b. benzene
 - c. radon
 - d. radionuclide salts
9. The *Drawdown* of a well:
- a. is the difference between the Static and Pumping water levels
 - b. is the difference between the ground surface and the pumping water level
 - c. is measured shortly after stopping the pump
 - d. increases as distance from the well increases

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10. Deep-well jet pumps can be utilized down to a depth of approximately:
- a. 50 feet
 - b. 150 feet
 - c. 500 feet
 - d. 1000 feet
11. You have a residential well with 119 feet of lift pressure, household pressure is 60 PSI, and friction loss adds 25 feet. How many feet of head must the pump work against? [1 PSI = 2.3 feet of head]
- a. 283
 - b. 327
 - c. 350
 - d. 400

National Electrical Code (NEC) 2011 (Chapters 1-4, 9)

12. Which of the following is not a means of connection when grounding equipment?
- (A) Listed pressure connector.
 - (B) Sheet metal screw.
 - (C) Machine screw.
 - (D) Connections that are a part of a listed assembly.

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====Answers =====

Chapter 27- Well Contractor Certification Rules

1. How many hours of continuing education are required each year to be able to renew Level B certification when the well contractor has been certified less than 3 years?
- a. 6
 - b. 8
 - c. 2
 - d. 0
- 15A NCAC 27 .0801(a)**

General Statutes

2. A certification as a well contractor issued by the Commission *shall be valid*:
- e. only in counties with well construction programs
 - f. only in counties you have registered with
 - g. in every county in the state **G.S. 87-98.5**
 - h. in North and South Carolina

NCAC 2C.0100- Well Construction

3. An opening in the well casing or well head installed for the primary purpose of determining the position of the water level in the well or to facilitate disinfection is:
- a. access port **2C.0102(2)**
 - b. well system
 - c. annular space
 - d. vent
4. What is the minimum amount of granular calcium hypochlorite required to disinfect a newly drilled 6" well that is 310 feet deep with a 30 foot static level? [a 6" diameter holds 1.5 gal/ft of water]
- a. 9 ounces
 - b. 3 ounces
 - c. 13 ounces **2C.0111(b)(1)(A)**
 - d. 28 ounces

First calculate how many gallons of water in the wellí
310 - 30= 280 ft water column
280ft x 1.5gal/ft = 420 gallons
Then,
(3 oz. needed per 100 gallons)
420/100= 4.20 4.20 *3oz =12.6

**NC Well Contractors Certification Examination
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NCAC 2C.0200- Well Construction, Injection Wells

5. A Closed-Loop Geothermal Well System is:
- a. **A system of continuous piping, part of which is installed in the subsurface, through which moves a fluid that does not exit the piping, and which is used to transfer heat energy between the subsurface and the fluid.** 2C.0204 (6)
 - b. A system and attendant processes used for improving the quality of contaminated groundwater by collecting or pumping groundwater, treating the groundwater to reduce the concentration of or remove contaminants, and reintroducing the treated water beneath the surface in such a manner that the treated groundwater will be recaptured by the collecting or pumping portion of the system.
 - c. Any excavation which is cored, bored, drilled, jetted, dug, or otherwise constructed, whose depth is greater than its largest surface dimension and which is used, or intended to be used, for the injection of fluids or solids into the subsurface or groundwaters.
 - d. Any well constructed for the primary purpose of obtaining samples of groundwater or other liquids for examination or testing, or for the observation or measurement of groundwater levels.

NCAC 2C.0300- Permitting and Inspection of Private Drinking Water Wells

6. The purpose or function of a well seal is:
- a. to prevent hydrostatic collapse caused by the heat of hydration
 - b. to center the pump in the borehole
 - c. to maintain equilibrium hydrostatic pressure at the interstitial plane
 - d. **to prevent pollutants from entering the well at the upper terminal**
15A NCAC 02C .0302 (17)

Manual of Water Well Construction Practices, 2nd edition

7. How is hypochlorous acid effected by pH?
- a. is more effective at higher pH levels
 - b. is effective only at a pH of 3-5
 - c. **is less effective at higher pH levels** MWWCP, 2nd ed., pg. 10-2, section 10.1
 - d. not effected by pH levels
8. A volatile organic chemical that may contaminate groundwater in areas around sources of gasoline or jet fuel:
- a. arsenic
 - b. **benzene** MWWCP, 2nd ed., pg.11-1, section 11.1.1
 - c. radon
 - d. radionuclide salts

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Groundwater and Wells, 3rd edition -Levels A & B only

9. The *Drawdown* of a well:
- a. **is the difference between the Static and Pumping water levels**
GW&W, 3rd Ed. pg.180 fig. 6.1
 - b. is the difference between the ground surface and the pumping water level
 - c. is measured shortly after stopping the pump
 - d. increases as distance from the well increases
10. Deep-well jet pumps can be utilized down to a depth of approximately:
- a. 50 feet
 - b. **150 feet** GW&W, 3rd Ed. pg 590
 - c. 500 feet
 - d. 1000 feet

The Pump Book -Levels C & D only

11. You have a residential well with 119 feet of lift pressure, household pressure is 60 PSI, and friction loss adds 25 feet. How many feet of head must the pump work against? [1 PSI = 2.3 feet of head]
- a. **283** TPB, pg 34
 - b. 327
 - c. 350 $60 \times 2.31 = 139$ + **119** +25 = **283**
 - d. 400
- convert household pressure from PSI to feet of head lift pressure friction loss

Total pressure required of the pump:

For each foot in elevation above the tank, you loose 0.433 PSI, 1 PSI = 2.3 ft of head

Convert ÷feet of head÷ to PSI by multiplying by 0.433

Convert PSI to feet of head by multiplying by 2.3

You can use either term to express pressure but you must be consistant in your formulas.

Lift pressure= measured in ÷feet of head÷. Ex.- The pumping level is x feet below the pressure tank.
(the static water level in the well is x feet below the pressure tank + y feet further of draw down)

Household Pressure= measured in PSI (pounds per square inch)

The pressure switch turn-off pressure (60 PSI if using a 40/60 pressure switch). Used to calculate the household pressure.

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National Electrical Code (NEC) 2011 (Chapters 1-4, 9)

12. Which of the following is not a means of connection when grounding equipment?
- (E) Listed pressure connector.
 - (F) Sheet metal screw. -2011 NEC 250.8**
 - (G) Machine screw.
 - (H) Connections that are a part of a listed assembly.