

# Home Inspector Practice Test

---

1. Which of the following soils can support the least load-bearing pressure?
  - a. Poorly graded sands
  - b. Silt with high compressibility
  - c. Poorly graded gravel
  - d. Sedimentary rock
2. In general, the grading around a building should be positively sloped for how many feet away from the building?
  - a. 5 feet
  - b. 10 feet
  - c. 25 feet
  - d. 50 feet
3. Flashing is not required at which of the following locations?
  - a. At built-in gutters
  - b. Above projecting wood trim
  - c. At wall and roof intersections
  - d. Above projecting masonry
4. Under which of the following conditions is a two-coat stucco system acceptable on the exterior of a building?
  - a. If the system is installed in an arid climate
  - b. If the system is installed over masonry or concrete
  - c. If the first coat is allowed to cure for a minimum of three days before the second coat is applied
  - d. If the sand-to-cement volume ratio is higher than three for the finish coat
5. Which of the following locations is the worst place to cut a hole in an I-joist?
  - a. In the center of the web
  - b. Near the end of the joist in the web
  - c. In the flange
  - d. I-joists must never have holes cut in them.
6. Why must building footings extend below the frost line?
  - a. So that the water in the concrete will not freeze and cause spalling in the footing
  - b. So that the soil around the footing does not freeze, expand, and cause the footing to shift
  - c. Building footings are not required to extend below the frost line unless the building is located in a very cold climate.
  - d. Because the footing could crack when the soil around it freezes and expands if it is not below the frost line.
7. Which of the following locations does not require a GFCI outlet?
  - a. Receptacles on kitchen counters
  - b. Receptacles in bathrooms
  - c. Receptacles near utility sinks
  - d. Receptacles that serve appliances

**8. Which of the following is a way that many homes' electrical systems are grounded?**

- a. Through a connection to the cold water piping
- b. Through a connection to the foundation
- c. Through a connection to an antenna
- d. Through a connection to the electrical service panel

**9. What are the types of heat that must be taken into account when calculating the cooling loads for an HVAC system?**

- a. Sensible and radiant heat
- b. Radiant and conductive heat
- c. Conductive and latent heat
- d. Sensible and latent heat

**10. How many BTU's per hour is a ton of cooling capacity in HVAC equipment equal to?**

- a. 2,000 BTU/hr
- b. 10,000 BTU/hr
- c. 12,000 BTU/hr
- d. 30,000 BTU/hr

**11. A gas furnace is being installed in a brand-new building. What is the most likely reason that an outdoor air source would be required?**

- a. The building has unusually tight construction.
- b. The furnace has a capacity greater than 60,000 BTU.
- c. The furnace is classified as a high-efficiency furnace.
- d. The furnace is located in a closet.

**12. What is the purpose of an expansion tank in a hot water system?**

- a. It provides a location where additional components can be added to the system without having to dismantle the rest of the system.
- b. It houses a heat exchanger to preheat incoming cold water with the excess heat from hot water.
- c. It allows the water to expand as it warms without increasing the pressure in the system.
- d. It keeps the water in the system from getting hotter than a pre-determined temperature.

**13. Which of the following is not a code requirement for electric clothes dryer exhaust ducts?**

- a. The exhaust must be independent of other exhaust systems.
- b. The exhaust duct must terminate outside of the building.
- c. The exhaust duct must have a backdraft damper and no screens.
- d. The diameter of the duct must be per the manufacturer's requirements but not less than 6".

**14. The utility bills for heating and cooling a home are much higher than expected. Which of the following choices is probably not a reason for this increased cost?**

- a. The ductwork is poorly insulated.
- b. The HVAC system has not been balanced.
- c. The fresh air intake for the HVAC system is incorrectly sized.
- d. The ductwork is poorly sealed.

## Answer Key and Explanations

---

**1. B:** Of these choices above, silt has the smallest particle size, while sand is the second smallest, and gravel the third smallest. Rock is the largest. Generally, the smaller the particle size, the less load-bearing pressure a soil type can support. If a material has high compressibility, then it is not fully settled and can be compressed more, making it unstable and lowering the pressure that it can support. In addition, well-graded soils can support more pressure than poorly graded soils because well-graded soils contain a mixture of particles of all different sizes. Poorly graded soils have particles of uniform size, or a poor distribution of particle sizes. This is important because well-graded soils have particles that fit together better and fill in the gaps between particles better, thus allowing them to support higher pressures.

**2. B:** The top of the foundation wall should be located so that the grade can slope away from the building for at least 10 feet and be at least 12 inches above the street drain, plus 2% of the distance from the street drain. So, if a house is 50 feet from the street drain, the top of the foundation must be 24 inches above the drain ( $12" + 600" \times .02$ ). As a general rule, the final grade around the building should fall 6 inches within this first 10 feet, which allows the grade outside of the 10-foot distance to be more gradual. This 10-foot rule also takes into account that other buildings are often close by, and therefore longer slopes may be impractical. When a 10-foot long slope is impossible, a 5% slope to a swale is allowed. These measures ensure that water that runs along the surface will drain away from the building rather than toward it, thus minimizing the incidences of water entering the building.

**3. D:** Flashing is not required above projecting masonry because it is unnecessary to protect the top of the masonry from getting wet. Oftentimes, there is masonry above the projecting masonry, and a line of grout that seals the joint between the two lines of masonry. Water should not be able to easily penetrate the grout. If a different material is above the masonry, it is likely that that material should be flashed underneath in order to prevent water from entering the wall system from below. Flashing is required for all of the other conditions because there are joints around them that, if left unflashed, could easily allow water to enter the wall system.

**4. B:** This answer is correct because with a masonry or concrete backup, the substrate itself has a texture that allows the stucco to bond to it. When the substrate is a different material, such as plywood, the first coat acts as the bonding surface, and then two layers are applied over top of it. In short, the masonry or concrete can act as the first layer. The other answers do not affect the necessary number of layers, though stucco may perform better in drier climates. Answers C and D can affect the quality of the finished product, but do not change the stucco system needed.

**5. C:** An I-joist has a thicker member that makes up the top and bottom flanges. This is because these are the locations where the forces acting on the joist are the greatest. By concentrating material in these locations, the joist can be strengthened, as the forces that act in the center of the joist are much lower in magnitude than at the flanges. Because the forces acting on the web are lower, holes can be cut in the web (up to a certain size) (Answer A) without affecting the load carrying performance of the joist substantially. One must take care in cutting holes near the ends of joists (Answer B), but this area is still not as critical as the flange. Answer D is incorrect because I-joists can have holes cut in them.

**6. B:** Soil has high water content, so when it freezes, the water in it expands. If the soil below the footing were to freeze and expand, it would raise the footing up and potentially shift the entire



building. Consequently, footings must be built in soil that should never freeze. The depth of the frost line depends on the climate of the building location. For example, the frost line will be a lot shallower in Florida than it will be in Minnesota.

**7. D:** GFCI (Ground Fault Circuit Interrupter) outlets are required in locations where water may be present. GFCI outlets work by measuring the amount of current flowing through a circuit and stopping the current if the amount returning into the outlet is less than the amount going out through the outlet. This situation would occur if the electricity began flowing through a person and, therefore, not returning through the outlet, which would most likely happen in situations where water is present. GFCI outlets must be used in locations where water is present (Answers A, B, and C) in order to save lives. There is no reason to put appliances on GFCI circuits, and this could be a nuisance in a situation where the circuit tripped accidentally and cut off power to the outlet without anyone noticing (for example, in the case of a refrigerator full of food).

**8. A:** Electrical systems are often grounded through a connection to the cold water piping in a house because the piping nearly always runs out of the house and is in contact with the earth (since it is buried in the earth back to the main water line). This serves as the way for current to flow safely to the earth in the event of a fault. Metal piping works well because it is a good conductor of electricity. Homes with PVC piping may be grounded using buried grounding rods instead. The foundation is also in contact with the ground (Answer B), but concrete does not conduct electricity well. Both Answers C and D are incorrect because these connections are not related to the earth for grounding.

**9. D:** Sensible heat is energy that causes a change in temperature. Latent heat is energy that comes from matter changing its state, but not its temperature. For example, when ice melts, it absorbs latent heat because energy is required for the phase change. HVAC systems must deal with both of these types of heat loads in order to make the indoor environment comfortable for occupants. The terms “radiant” and “conductive” (Answers A, B, and C) refer to types of heat transfer, or ways that heat can be gained or lost, but not to an actual value of heat gain or loss.

**10. C:** One ton of cooling capacity is equal to 12,000 BTU's per hour of cooling capacity. One ton of cooling capacity in a cooling system is the equivalent amount of cooling that would be provided by one ton of ice. Most residential systems are on the order of one to five tons. A very rough way to estimate the size of the HVAC system needed is that one ton is needed for every 400-600 square feet of floor area. Note that this is a very rough estimate, and exact loads should be calculated by the system designer.

**11. A:** Normally combustion air for a gas furnace can be taken in from the interior space, with the idea being that this air is replaced by air that infiltrates into the building through gaps in the wall construction. If a building has unusually tight construction, it is harder for this “makeup” air to enter the building, and the fan on the furnace will have to work harder to bring in combustion air. This is only an issue in newer buildings, as the construction of older buildings is loose enough to allow plenty of air infiltration.

**12. C:** When water is heated, it expands. If one is dealing with a closed loop system, there would typically be no room for the water to expand, which would increase the pressure in the system. This could lead to a potentially unsafe situation. An expansion tank is a tank that has an air cushion in it. As the water heats up and expands, the additional volume is taken care of in the expansion tank because the air cushion becomes compressed. As the water temperature drops, the air cushion in the tank can return to its normal size.