

Exploring Greenhouse Structures

► Part One: Matching

Instructions: Match the term with the correct definition.

- | | |
|--------------|--------------------------------|
| a. bench | f. lean-to greenhouse |
| b. glass | g. polyethylene |
| c. glazing | h. retractable-roof greenhouse |
| d. headhouse | i. ridge-and-furrow greenhouse |
| e. hoophouse | j. rolling bench |

- ____ 1. Considered the best material for plant production as it provides the highest light transmission of any glazing material at 88% to 89%
- ____ 2. Structures with roofs that can be opened and closed
- ____ 3. Benches that rest on pipes for movement thus maximizing the growing space in the greenhouse
- ____ 4. Structure attached to the greenhouse that serves as a storage area and a work area
- ____ 5. Structure consisting of a number of greenhouses connected together along the length of the houses
- ____ 6. Most widely used glazing material consisting of flexible sheets, usually 6-mil in thickness
- ____ 7. The covering of a greenhouse
- ____ 8. The structure that holds the plants above the ground
- ____ 9. A greenhouse that shares a wall with a building and relies on the building structure to provide some support for the greenhouse roof
- ____ 10. A common even-span greenhouse that uses arching pipes for the framework

► Part Two: Multiple Choice

Instructions: Select the best answer to the question.

- ____ 1. What type of glazing material is widely used because it has good light transmission, it resists hail damage, and it is easy to work with?
- acrylic structured sheets
 - fiberglass
 - polycarbonate structured sheets
 - polyethylene sheets

- _____ 2. What type of greenhouse structure is opened when weather conditions are favorable to plant growth and closed when the crops need protection?
- headhouse
 - Quonset hut
 - retractable roof
 - shadehouse
- _____ 3. What greenhouse style has unequal pitches and widths and is used on hillsides?
- lean-to
 - even-span
 - ridge-and-furrow
 - uneven-span
- _____ 4. What supports the greenhouse covering material?
- glazing
 - greenhouse framework
 - polycarbonate structured sheets
 - expanded galvanized steel
- _____ 5. What is the structure that holds the plants above the ground?
- bench
 - framework
 - glazing
 - structured sheets

► **Part Three: Short Answer**

Instructions: Answer the following questions.

1. What are the four basic styles of greenhouse design?
2. What are the desirable qualities of the greenhouse framework?
3. What are four materials used for greenhouse framework?
4. What should be considered when selecting a glazing material?

5. What functions take place in the headhouse?

6. What are some materials used for greenhouse benches?

Controlling the Greenhouse Climate

► Part One: Matching

Instructions: Match the term with the correct definition.

- | | |
|-------------------------------|-----------------------|
| a. analog controls | f. hot-water system |
| b. computer controls | g. polyethylene tubes |
| c. energy curtains | h. steam heat |
| d. environmental controls | i. thermostats |
| e. fan-and-pad cooling system | j. vents |

- ____ 1. Involves boilers that bring water to a boil and the resulting steam flows through pipes in the greenhouse
- ____ 2. Attached to the unit heaters, these help to evenly distribute the airflow
- ____ 3. Automated systems using fabrics that can insulate a greenhouse at night and shade the crops during the day
- ____ 4. Involves cellulose or aspen pads at one end of the house that are kept wet, while fans at the other end of the house pull outside air through the pads
- ____ 5. Natural cooling is made possible with this system that consists of panels that open and allow air exchange with the outside.
- ____ 6. Involves heating water in a boiler and pumping the hot water through pipes located in the greenhouse
- ____ 7. Devices used to turn greenhouse systems on and off, including heating and cooling systems
- ____ 8. Uses microprocessors to make complex judgments based on information from a number of sensors
- ____ 9. Uses proportioning thermostats to run amplifiers and electronic circuitry
- ____ 10. Low cost and easy to install environmental controls

► Part Two: Multiple Choice

Instructions: Select the best answer to the question.

- _____1. What type of heaters heat air within the heater and then blow the air throughout the greenhouse?
 - a. infrared heaters
 - b. hot-water heaters
 - c. steam heaters
 - d. unit heaters

- _____2. What involves an atomizer so as to produce water vapor that cools the greenhouse as it quickly evaporates?
 - a. fan-and-pad cooling systems
 - b. fog systems
 - c. swamp coolers
 - d. vents

- _____3. _____ although expensive, are accurate and can control all the automated systems together.
 - a. analog controls
 - b. computerized environmental management systems
 - c. on-off thermostats
 - d. proportioning thermostats

- _____4. What produce heat energy that is absorbed by the plants, media, and benches?
 - a. infrared heaters
 - b. hot-water heaters
 - c. steam heaters
 - d. unit heaters

- _____5. What function to provide darkness that simulates a short-day effect?
 - a. energy curtains
 - b. long-day curtains
 - c. short-day curtains
 - d. shade cloth

► Part Three: Short Answer

Instructions: Answer the following questions.

1. List four methods of heating a greenhouse.

2. What are three methods used to cool or ventilate a greenhouse?

3. How do short-day curtains differ from energy curtains?

4. List four environmental controls used in the greenhouse.