

**National FFA Career Development Event
Food Science and Technology
2012 Exam**

1. Many foods are designed to be heated in a microwave oven which delivers electromagnetic waves to transmit energy to food. Which of the following statements is correct?
 - a. The longer the wavelength, the greater the energy
 - b. The shorter the wavelength, the lower the energy
 - c. The shorter the wavelength, the greater the energy**
 - d. There is no change in energy as wavelength changes

2. Unflavored _____ is polar molecule derived from animal protein used to stabilize liquids in food manufacturing and can bind 100 times its weight in water.
 - a. myoglobin
 - b. hemoglobin
 - c. actomyosin
 - d. gelatin**

3. _____ is an example of a heterogeneous mixture.
 - a. Salt water
 - b. Potato soup**
 - c. Cola
 - d. White vinegar

4. For a food scientist to formulate new products, they must be familiar with ingredients that could be used in a formulation. A food scientist was asked to develop a seasoning using coriander leaves that could be used in Latin American, Asian, and Middle Eastern products. Another name for coriander leaves is _____.
 - a. cilantro**
 - b. bay leaves
 - c. chervil
 - d. savory

5. Large pressure canners used for commercial canning are called _____.
 - a. vertical condensers
 - b. kettle agitators
 - c. retorts**
 - d. comitrols

6. A monounsaturated fat lacks two hydrogens, creating one double bond between carbon atoms, and tends to lower LDL cholesterol without affecting HDL levels. _____ is a food that is naturally high in monounsaturated fat.
 - a. Avocado**
 - b. Ground beef
 - c. Coconut oil
 - d. Cheddar cheese

7. Sensory evaluation panels that use discrimination tests are obtaining information about products to describe _____.

a. if the products are different

b. if the products are different, how are they different

c. what is the acceptability of the products

d. if one of the products is preferred over another

8. _____ is a common term for the osmotic process that causes some water-soluble components in vegetable to leave the vegetables for the surrounding medium during the canning process.

a. Blanching

b. Pickling

c. Leaching

d. Marinating

9. Frozen carbon dioxide is preferable for pre-cooling some food products because it does not go through a liquid state, but goes from a solid state to a gaseous state in a process is known as _____.

a. condensation

b. deposition

c. deionization

d. sublimation

10. When fruits and vegetables are dried, they should contain _____ percent of their original moisture, otherwise the finished product quality will not be acceptable.

a. 5-10

b. 10-15

c. 15-20

d. 20-25

11. Maltose, a disaccharide found in cereals and sprouting grains consists of _____.

a. glucose and fructose

b. two glucose units

c. glucose and galactose

d. two fructose units

12. A food scientist would _____ to draw a general conclusion from specific facts or experiences.

a. develop a hypothesis

b. use inductive reasoning

c. use deductive reasoning

d. develop a theory

13. A company that manufactures bread should use hard wheat flour rather than soft wheat flour because the hard wheat would have a _____.

- a. higher protein-to-starch ratio**
- b. lower protein-to-starch ratio
- c. higher fat content
- d. lower water content

14. The essential fatty acid, alpha-linolenic acid, is also considered an _____ which may reduce the risk of coronary heart disease

- a. omega-6 fatty acid
- b. omega-12 fatty acid
- c. omega-9 fatty acid
- d. omega-3 fatty acid**

15. HACCP is a systematic, science based process control system for _____.

- a. food safety and quality
- b. food safety**
- c. food quality
- d. sanitation

16. One of the reasons that a company such as Kellogg's would add _____ to some of their products is that it absorbs water after the food is consumed. This in turn facilitates moving food through the digestive tract which may help prevent colon cancer as well as lower blood cholesterol levels.

- a. protein
- b. fat
- c. sugar
- d. fiber**

17. _____ degrees separates freezing and boiling points on the Celsius scale.

- a. 50
- b. 100**
- c. 150
- d. 200

18. When sodium nitrite is added to a formulation to manufacture a frankfurter, the thermally processed frankfurter color is pink due to the formation of _____.

- a. nitrosohemochrome**
- b. metmyoglobin
- c. nitric oxide myoglobin
- d. myoglobin

19. Early explorers fed food to _____ to determine if the food was potentially safe for human consumption.
- a. cows
 - b. chickens
 - c. pigs**
 - d. goats
20. The nonnutritive sweetener called sucralose, also known by the brand name Splenda, is _____ times sweeter than sugar.
- a. 200
 - b. 300
 - c. 600**
 - d. 4,000
21. To estimate basal metabolic rate of a woman weighing 130 pounds to know how much energy she needs to consume for breathing, digesting food, growing new cells, and other basic processes, first convert her mass to kilograms. Then, calculate the kcalories she would use per hour by multiplying her mass by a BMR factor of 0.9 to learn her BMR. Finally, multiply her BMR by 24 since there are 24 hours/day to find her estimated daily basal kcalorie needs. Her estimated daily basal kcalorie needs would be _____ kcalories/day.
- a. 2808
 - b. 1276**
 - c. 1106
 - d. 2071
22. It is important for food scientists to be aware of where to source ingredients for food products. Approximately three-quarters of the world's supply of cocoa come from _____.
- a. West Africa**
 - b. Brazil
 - c. Indonesia
 - d. Ecuador
23. HTST milk refers to the use of _____ procedures for the production of this product.
- a. high throughput short time
 - b. high transition small time
 - c. homogenous throughput short treatment
 - d. high temperature short time**
24. Food chemists must have MSDS or _____ sheets accessible for all chemicals stored in their lab.
- a. manufacturers safety data specifications
 - b. material safety data sheets**
 - c. material specification data sheets
 - d. manufacturers support data sheets

25. During the manufacture of many breakfast cereals, B vitamins are added to the formulation to achieve a specific dietary purpose since they are not normally found in this food. This is an example of _____.

- a. enrichment
- b. enhancement
- c. fortification**
- d. augmentation

26. With the _____ on a Nutrition Facts panel, consumers can determine how the nutrients in a food serving fit into what they could consume for the day.

- a. Recommended Daily Allowance
- b. Daily Value**
- c. Recommended Dietary Allowance
- d. calories per serving

27. _____ is a naturally occurring chemical in chili peppers that makes them hot.

- a. Glucosinolate
- b. Nitrate
- c. Ascorbic acid
- d. Capsaicin**

28. _____ is a corrosion-resistant surface that should not be used for direct food contact in a food production environment because it can discolor some foods and is highly reactive with acids.

- a. Galvanized iron**
- b. Stainless steel
- c. High density polyethylene
- d. Titanium

29. The major objective of _____ is to control pests economically through environmentally sound techniques in a food processing facility.

- a. TQM
- b. MPN
- c. IPM**
- d. TQC

30. A food scientist is conducting a study that involves measuring the volume of a liquid using a graduated cylinder. The volume of liquid is read from the _____.

- a. meniscus
- b. meniscus**
- c. mendelevium
- d. mesomerism

31. The method of heat transfer where heat energy is passed by the collision of molecules is called _____.

- a. radiation
- b. convection
- c. conduction**
- d. microwave

32. Corn, soybeans, and canola improved by _____ could produce oils that have a better balanced saturated/unsaturated fat content.

- a. blanching
- b. proteolysis
- c. hydrogenation
- d. biotechnology**

33. An ingredient that is GRAS has been shown to be safe under the conditions of its intended use according to the _____.

- a. FDA**
- b. USDA FSIS
- c. EPA
- d. FSMA

34. The detection of an odor when it is released from food in your mouth during chewing, exhalation, or swallowing is called _____ olfaction.

- a. orthonasal
- b. retronasal**
- c. chemonasal
- d. sensoronasal

35. _____ means access to enough food for people to maintain an active, healthy lifestyle.

- a. Food safety
- b. Food insecurity
- c. Food security**
- d. Food biodefense

36. Soft drinks are _____ formulations with a pH less than 7.0

- a. neutral
- b. acidic**
- c. basic
- d. caustic

37. By federal law, baking powder must yield at least _____ CO₂ for every 100 g of powder.

- a. 7 g
- b. 12 g**
- c. 19 g
- d. 25 g

38. _____ is a microorganism that is found on the skin of many people and can form a heat stable toxin in temperature abused food.
- a. *Clostridium botulinum*
 - b. *Listeria monocytogenes*
 - c. *Escherichia coli* O157:H7
 - d. *Staphylococcus aureus***
39. Ice cream and pudding are examples of food that may contain alginate, a type of polysaccharide that occurs naturally in _____ as a skeletal component of their cell walls.
- a. deciduous trees
 - b. potatoes
 - c. corn
 - d. brown seaweed**
40. When oxygen reacts with _____ in freshly cut banana, the bananas turn brown.
- a. sugars
 - b. enzymes**
 - c. proteins
 - d. fats
41. Mixing boiling water with gelatin forms a(n) _____.
- a. colloidal dispersion**
 - b. immiscible dispersion
 - c. true solution
 - d. precipitate
42. A product development team is developing a new product. What would be the usual order for taking the product from concept to production?
- a. bench top formulation → prototype → pilot plant formulation → full scale production
 - b. bench top formulation → pilot plant formulation → prototype → full scale production
 - c. prototype → bench top formulation → pilot plant formulation → full scale production**
 - d. prototype → pilot plant formulation → bench top formulation → full scale production
43. Collagen is a _____ found in connective tissue of animals that can be solubilized and dried to form a powder used in gelatin.
- a. fat
 - b. protein**
 - c. carbohydrate
 - d. mineral
44. Which of the following items would NOT be considered a physical hazard in a food product?
- a. glass fragment
 - b. piece of metal that is 1 cm in length
 - c. strand of hair**
 - d. plastic chip that is 2 cm in length

45. The concentration of a 23 g of sugar in 105 g of water would be _____.
a. 18%
b. 20%
c. 22%
d. 28%
46. In the manufacture of popsicles, what phase change would a liquid sugar solution go through to become a solid?
a. vaporization
b. condensation
c. melting
d. freezing
47. _____ is added to many breakfast cereals to increase consumption of this nutrient which is important to help prevent birth defects of the brain and spinal cord.
a. Biotin
b. Niacin
c. Folic acid
d. Thiamin
48. Acetic acid is a _____ ingredient.
a. hydrophobic
b. hydrophilic
c. non-polar
d. long chain fatty acid
49. A product that is capable of being stored at room temperature for a prolonged or indefinite period of time with little deterioration in quality is a _____ product
a. perishable
b. unstable
c. fresh
d. shelf stable
50. _____ is not a reliable indicator of doneness when ground beef patties are prepared for consumption.
a. Texture
b. Color
c. Cooking time
d. Aroma