MULTIPLE CHOICE
Select only one answer (letter) per question. Bubble your selection on the associated Scantron. Only selections on the Scantron will be scored (4 points per question; 100 points total).

1) The Jack in the Box outbreak of 1993 began in the state of Washington. Which of the following was the primary pathogen associated with this outbreak?
   a. *Clostridium perfringens*
   b. *Salmonella enterica*
   c. *Escherichia coli* O157:H7
   d. *Escherichia coli* O145

2) Which branch of the United States Department of Agriculture (USDA) is responsible for ensuring the wholesomeness of meat products?
   a. Agricultural Marketing Service
   b. Food Safety Inspection Service
   c. Food and Drug Administration
   d. Agricultural Research Service

3) What is the term for the time required to lapse between when an animal receives an antibiotic treatment and when the animal can be harvested to produce meat for consumption?
   a. Lairage
   b. Payout period
   c. Compensatory growth
   d. Withdrawal period

4) Which of the following is NOT a mode of action for beta-agonists?
   a. Increased protein production
   b. Decreased fat degradation
   c. Decreased protein degradation
   d. Decreased fat production

5) What is the approximate pH of muscle in a living animal?
   a. 9.0
   b. 7.4
   c. 5.6
   d. 5.2
6) When consumed in an amount to obtain 25 g of dietary protein, which of the following contains the fewest Calories?
   a. Beef sirloin steak
   b. Peanut butter
   c. Cheddar cheese
   d. Quinoa

7) Skeletal muscle is a highly organized structure. Which is the correct arrangement of skeletal muscle structures from most intact to least intact?
   a. Muscle fiber, Muscle bundle, Sarcomere
   b. Sarcomere, Muscle fiber, Muscle bundle
   c. Muscle bundle, Sarcomere, Muscle fiber
   d. Muscle bundle, Muscle fiber, Sarcomere

8) Which of the following is NOT a primal cut of a beef carcass?
   a. Shoulder
   b. Rib
   c. Plate
   d. Round

9) Which of the following is NOT used in the determination of USDA Quality Grade of a lamb carcass?
   a. Fat streaking in the flanks
   b. Marbling score
   c. Break joints vs. spool joints
   d. Leg conformation

10) Which of the following combinations of marbling score and maturity class should predict the most desirable level of eating quality in a beef carcass?
    a. Slightly abundant; E maturity
    b. Moderate; A maturity
    c. Modest; A maturity
    d. Slight; C maturity

11) Which of the following is NOT a recommended method of defrosting meat products?
    a. Leaving on the counter
    b. Placing in the refrigerator
    c. Placing in cold water
    d. Using the microwave
12) Which of the following is a parasite?
   a. *Clostridium botulinum*
   b. Norovirus
   c. *Vibrio vulnificus*
   d. *Trichinella spiralis*

13) What of the following is added to meat products to prevent growth of *Clostridium botulinum*?
   a. Sodium chloride
   b. Potassium lactate
   c. Ascorbic acid
   d. Sodium nitrite

14) Which of the following is synthetic hormone commonly incorporated into growth-promoting implants?
   a. Estradiol
   b. Testosterone
   c. Trenbolone acetate
   d. Progesterone

15) Which of the following types of fatty acids contain single bonds between carbon atoms?
   a. Omega-3 fatty acids
   b. Saturated fatty acids
   c. Monounsaturated fatty acids
   d. Polyunsaturated fatty acids

16) What protein comprises the thick filament of muscle?
   a. Calpain
   b. Troponin
   c. Myosin
   d. Actin

17) Which of the following must be present for meat to appear red in color?
   a. Water
   b. Nitrogen
   c. Oxygen
   d. Hydrogen

18) Which of the following is NOT characteristic of meat from mature animals in comparison to meat from young animals?
   a. Decreased tenderness
   b. More intense flavor
   c. Coarser texture
   d. Lighter and brighter color
19) Which of the following is responsible for the yellow fat on carcasses of grass-fed animals?
   a. Carotene  
   b. Lignin  
   c. Vitamin E  
   d. Calcium

20) What is the maximum amount of time that food can be safely held in the temperature danger zone of 40 °F to 140 °F before needing to be discarded?
   a. 2 hours  
   b. 4 hours  
   c. 6 hours  
   d. 8 hours

21) Bromelain is an enzyme extracted from pineapple. Which of the following is the primary use for bromelain in meat products?
   a. To increase the amount of marbling  
   b. To increase tenderness  
   c. To increase water holding capacity  
   d. To improve red color

22) What is the temperature at which meat begins to freeze?
   a. 32 °F  
   b. 30 °F  
   c. 28 °F  
   d. 0 °F

23) Which of the following pathogens is associated with miscarriages in pregnant women?
   a. Listeria monocytogenes  
   b. Escherichia coli  
   c. Clostridium botulinum  
   d. Campylobacter jejuni

24) What is the term for the removal of the internal organs during slaughter?
   a. Exsanguination  
   b. Scalding  
   c. Lairage  
   d. Evisceration

25) Which of the following is NOT required on the label of USDA-inspected retail product?
   a. Establishment number  
   b. Net weight  
   c. Sell-by date  
   d. Ingredient list
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