1. The start codon AUG codes for

(A) Arginine
(B) Lysin
(C) Methionine
(D) Glysine
(E) Answer not known

2. The enzyme involved in repair of both thymine dimers and deaminate cytosine in E.Coil is

(A) DNA Polymerase III
(B) DNA Polymerase I
(C) AP Endonuclease
(D) Uracil N-Glycosylase
(E) Answer not known

3. The kinetic models are used to describe specific growth rates of microorganism. Which one of the following models does not belong to kinetic model?

(A) Monod Model
(B) Micro Model
(C) Logistic Model
(D) Haldane Model
(E) Answer not known

4. A slime layer

(A) Is a water soluble glycocalyx
(B) Causes dental caries
(C) Is found in eukaryotes
(D) Is involved in microbial conjugation
(E) Answer not known

5. Impairment of the pentose phosphate pathway leads to

(A) Erythrocyte hemolysis
(B) Hypoglycemia
(C) Diabetic catract
(D) Ketosis
(E) Answer not known

6. In enzyme kinetics, the substrate concentration at which an enzyme reaches half saturation is denoted as

(A) K_m
(B) V_{max}
(C) K_i
(D) K_s
(E) Answer not known

7. Restriction Enzymes show relaxation in specificity of recognition sequence/site under non-optimal conditions is called

(A) Host controlled restriction and modification
(B) Methyltransferases activity
(C) Star activity
(D) Host controlled restriction
(E) Answer not known

8. The salvage pathway of nucleic acid synthesis involves an important enzyme, Hypoxanthine-Guanine Phosphoribosyl Transferage (HGPRT). Absence of HGPRT results in one of the following complications?

(A) Down Syndrome
(B) Lesch – Nyhan Syndrome
(C) Gout
(D) Tay Sachs disease
(E) Answer not known

9. Foreign DNA can be introduced into plant cells using indirect (vector mediated) method of Gene transfer through

(A) Lipofection

(B) Microinjection

(C) Electroporation

(D) Agrobacterium mediated transformation

(E) Answer not known

10. Identify the correct example for :

(i) Negative inducible operon.

(ii) Positive inducible operon.

(A) (i) lac and gal (ii) mal and ara

(B) (i) lac and trp (ii) arg and ara

(C) (i) arg and gal (ii) mal and ara

(D) (i) lac and arg (ii) mal and trp

(E) Answer not known

11. Alpha Linolenic Acid (ALA) is obtained from which of the following food source

(A) OIC of brown algae (B) Walnut

(C) Tuna (D) Organ meats like liver

(E) Answer not known

12. Find out the correct mineral from the following which is used in nervous tissue

(A) Potassium (B) Iron

(C) Chlorine (D) Zinc

(E) Answer not known

13. The enzyme which is responsible for browning reaction in fruits and vegetables is

(A) Phenolase
(B) Protease
(C) Oxidase
(D) Amylase
(E) Answer not known

14. Assertion [A] : Hydrogen Peroxide (H_2O_2) is used in food products as bleaching, oxidizing anti microbial agent.

Reason [R] : Hydrogen Peroxide (H_2O_2) gets decomposed into oxygen and water under normal condition and no toxic residues in it. It is Generally Recognised As Safe [GRAS].

(A) [A] is true but [R] is false
(B) Both [A] and [R] are true; [R] is the correct explanation of [A]
(C) [A] is false, [R] is true
(D) Both [A] and [R] are true; [R] is not the correct explanation of [A]
(E) Answer not known

15. Match correctly the microorganism with their functionality :

(a)	Proteolytic	1.	Arthrobacter
(b)	Lipolytic	2.	Bacillus Cereus
(c)	Saccharolytic	3.	Pseudomonas Fluorescens
(d)	Pectinolytic	4.	Clostridium Butyricum

	(a)	(b)	(c)	(d)
(A)	1	3	4	2
(B)	2	3	4	1
(C)	3	2	4	1
(D)	4	1	3	2

(E) Answer not known

16. Which of the following is not the part of sensory evaluation of foods?

(A) Appearance
(B) Colour
(C) Flavour
(D) Moisture content
(E) Answer not known

17. Freezing point helps to check which of the following adulteration in milk?

(A) Sugar
(B) Water
(C) Starch
(D) Colour
(E) Answer not known

18. An inflammation of the mammary gland caused from trauma or an inflection, leading to abnormal and decreased milk production is

(A) Bovine rhinotracheitis

(B) Bovine Mastitis

(C) Milk fever

(D) Bovine babesiosis (tick fever)

(E) Answer not known

19. An enzyme that naturally present in raw milk, which is used as an indicator of proper milk pasteurization

(A) Caseinases

(B) Alkaline phosphatase

(C) Lipase

(D) Serine protease

(E) Answer not known

20. Identify the correct option with respect to :

(i) Homofermentative and

(ii) Heterofermentative types

(A) (i) only produce CO_2 (ii) produce a mixture of products

(B) (i) only produce lactic acid (ii) produce a mixture of products

(C) (i) only produce formic acid (ii) only produce lactic acid

(D) (i) only produce lactic acid (ii) only produce ethanol

(E) Answer not known

21. Match correctly the food products (first column) with their food category name (second column), as per food category system of Indian food regulation :

(a)	Butter	1.	Beverages, excluding dairy product
(b)	Chewing gum	2.	Fats and oils and fat emulsions
(c)	Lactose	3.	Confectionery
(d)	Fruit nectar	4.	Sweeteners, including honey

	(a)	(b)	(c)	(d)
(A)	3	4	1	2
(B)	2	3	4	1
(C)	3	2	1	4
(D)	2	4	3	1

(E) Answer not known

22. As per Food Safety and Standards Regulations 2011, choose the foods from the list given below where Monosodium Glutamate is not allowed

(1) Alcoholic Beverages

(2) Foods for young children (weaning foods)

(3) Carbonated water

(4) Chocolate

(A) (1), (2), (3)
(B) (1), (3), (4)
(C) (2), (3), (4)
(D) (1), (2), (3), (4)
(E) Answer not known

23. Identify the flavouring agents from the list given below which are prohibited from their usage in food products :

(1) Estragole

(2) Ethyl Methyl Ketone

(3) Coumarin and dihydrocoumarin

(4) Malic acid (D–, L–)

(A) (1), (2) (B) (3), (4)

(C) (1), (2), (3) (D) (1), (2), (4)

(E) Answer not known

24. Choose the food products from the list given below where BIS certification is mandatory along with a licence or registration under Food Safety and Standards Act, 2006.

(1) Milk Powder

(2) Packaged Drinking Water

(3) Skimmed milk-powder, standard grade

(4) Hexane, Food grade

(A) (1), (3) (B) (1), (2), (3)

(C) (1), (3), (4) (D) (1), (2), (3), (4)

(E) Answer not known

25. Choose the correct choice for the Food Authority under FSSAI :

(i) Food Authority is a single person appointed by GOI.

(ii) Food Authority is assisted and advised by scientific panels, central advisory committee.

(iii) Food Authority brings time to time new regulations to regulate food activities.

(A) (i) only
(B) (ii) and (iii)
(C) (i) and (ii)
(D) (i) and (iii)
(E) Answer not known

26. The Food Safety and Standards for Contaminants, Toxins and Residues, Regulations 2011 defines "Crop Contaminant" as

(A) Infection by microbes
(B) Cross contamination in field by weed intensionally
(C) Contaminants not intentionally added to food in the process of their production
(D) Contamination during consumption by customers
(E) Answer not known

27. "FSSAI" is established by the Food Safety and Standards Act under the

(A) Ministry of Science and Technology
(B) Ministry of Health and Family Welfare
(C) Ministry of External Affairs
(D) Ministry of Trades and Commerce
(E) Answer not known

28. Assertion [A] : Definition for milk as per FSSAI regulations is "The normal mammary secretion derived from healthy milk producing animal with no adultrants and additives.

Reason [R] : Milk may have added with additives and adultrants before selling it to customers. Hence, FSSAI includes in the definition of milk considered with addition of adultrants.

(A) [A] is true, but [R] is false

(B) [A] and [R] are true, but [R] is not the correct explanation for [A]

(C) [A] and [R] are false

(D) [A] is false but [R] is true

(E) Answer not known

29. Examples of positive internalities :

(1) Exercise

(2) Healthy Eating

(3) Drinking sugary drinks

(A) Options (1) and (2) are correct

(B) Options (1) and (3) are correct

(C) Options (2) and (3) are correct

(D) (1), (2) and (3) are correct

(E) Answer not known

30. Identify the food safety and public health-related initiatives in WHO :

(1) Antimicrobial Resistance

(2) Climate Change

(3) Environmental Health, Water and Sanitation

(A) Options (1) and (2) only
(B) Options (1) and (3) only
(C) Options (2) and (3) only
(D) (1), (2) and (3)
(E) Answer not known

31. ACCC stands for

(A) American Competition and Consumer Commission
(B) Australian Competition and Consumer Commission
(C) Asian Competition and Consumer Commission
(D) American Competition and Consumer Council
(E) Answer not known

32. General principles of European food law includes :

(1) Risk Analysis

(2) Precautionary principle

(3) Food Product Recall

(4) Protection of consumers' interest

(A) Options (1), (2), (3) only
(B) Options (1), (2), (4) only
(C) Options (1), (3), (4) only
(D) Options (2), (3), (4) only
(E) Answer not known

33. IFPRI stands for

(A) Indian Food Policy Research Institute
(B) Indian Food Packaging Research Institute
(C) International Food Packaging Research Institute
(D) International Food Policy Research Institute
(E) Answer not known

34. The Community Trademark of Europe covers

(A) Europe and Asia
(B) 27 Countries
(C) Entire World
(D) 51 Countries
(E) Answer not known

35. The initiative developed by WHO "Five Keys to safer food" is for

(A) To implement a HACCP system

(B) To do microbiological food analysis of a food sample

(C) Educating consumers and food handlers about safe food handling to avoid food borne diseases

(D) Implementing GMP and GHP in food premises

(E) Answer not known

36. Statement I : Corn is the only GM grain sold on the market today.

Statement II : Canned foods do not contain GM ingredients

Choose the correct option :

(A) Both Statement I and II are true

(B) Both Statement I and II are false

(C) Statement I is true, but Statement II is false

(D) Statement II is true, but Statement I is false

(E) Answer not known

37. All the following are direct measures for monitoring the nutritional status of the general public except

(A) Parasitosis

(B) Anthropometric measures and surveys

(C) Dietary assessment

(D) Clinical assessment

(E) Answer not known

38. The highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the general population is called as

(A) Dietary Reference Intakes (DRIs)

(B) Adequate Intake (AI)

(C) Recommended Dietary Allowance (RDA)

(D) Tolerable Upper Intake Level (UL)

(E) Answer not known

39. Regarding recall bias

(A) It refers to inaccurate reporting by a study subject that leads to less accurate study results

(B) It is a variable that is related to both the exposure and the outcome, skewing the study results

(C) It is the ability of a variable in a study to be strongly linked to the result that it can be determined that the variable caused the result

(D) It occurs due to systematic differences between study groups in the number and the way participants are lost from a study

(E) Answer not known

40. Regarding food sovereignty

(A) It refers to consumers right to choose any food

(B) It refers to communities right to control their own food systems

(C) It is the control of food prices by the food industry

(D) It refers to the food preferences of individuals decided by the industry

(E) Answer not known

41. In Chromatography, the retention volume is best described as

(A) The volume of mobile phase required to elute a particular solute from the column

(B) The volume of stationary phase required to elute a particular solute from the column

(C) The volume of sample required to elute a particular solute from the column

(D) The ratio of solute to solvent used

(E) Answer not known

42. If a solute is applied to the center of a column, the band would broaden as the molecules diffuse. This is best described as

(A) Column diffusion

(B) Zonal diffusion

(C) Band diffusion

(D) Longitudinal diffusion

(E) Answer not known

43. Chromatographic columns have their own lifetime of injections. What is the typical lifetime of HPLC columns?

(A) Less than 50 injections

(B) 50 – 100 injections

(C) 5000 – 10,000 injections

(D) 500 – 2,000 injections

(E) Answer not known

44. The detectors have the limit of detection of 0.001 – 0.01 ng is considered as

(A) Ultraviolet detectors

(B) Refractive index detectors

(C) Fluorescence detectors

(D) Electrochemical detectors

(E) Answer not known

45. The carrier gas plays an important role in Gas chromatography. All the following are commonly used carrier gas in GC, Except

(A) Nitrogen
(B) Oxygen
(C) Helium
(D) Argon
(E) Answer not known

46. One among the following detectors have a Limit of Detection (LOD) of 100 fg/s

(A) Photoionization
(B) Nitrogen – Phosphorus
(C) Electron capture
(D) Flame ionization
(E) Answer not known

47. Capillary columns are classified with respect to column diameters. A column diameter of < 0.1 mm is called as

(A) Wide bore
(B) Microbore
(C) Narrow bore
(D) Submicrobore
(E) Answer not known

48. Most gas chromatography columns bear two temperature limits; lower and higher temperature. The high temperatures decompose the stationary phase and cause;

(A) Column bleeding
(B) Column cracking
(C) Column breaking
(D) Column disintegration
(E) Answer not known

49. One among the following technique suitable for the detection of pesticides present in food that decomposed at normal exposure to different gases with varying temperature levels

(A) HPLC
(B) GC
(C) FTIR
(D) TGA
(E) Answer not known

50. Assertion [A] : MS is the only technique used for the determination of molecular formula from molecular weight.

Reason [R] : In MS, samples conversion into an ionized state, with or without fragmentation. Which is then characterized by its mass to charge ratio.

(A) [A] is true, but [R] is false
(B) Both [A] and [R] are true, and [R] is the correct explanation of [A]
(C) [A] is false [R] is true
(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]
(E) Answer not known

51. In LCMS analysis of food sample for Post-Translational Modifications (PTMs), the following functional diversities in protein can be detected except,

(A) Phosphorylation
(B) Glycosylation
(C) Methylation
(D) Hybridization
(E) Answer not known

52. Identify the following food samples suitable for SEM analysis

(A) Myonnaise (Oil in water emulsion)
(B) Alcoholic beverages
(C) Methane presence in liquor
(D) Carbonated drinks
(E) Answer not known

53. Wavelength for Near-IR absorption bands of water

(A) 1400-1450, 1920-1950 nm
(B) 1420-1460, 1930-1960 nm
(C) 1440-1470, 1940-1970 nm
(D) 1450-1480,1950-1980 nm
(E) Answer not known

54. Infrared spectroscopy has become an important tool used by the chemists to identify the functional groups in ———— compounds

(A) Organic
(B) Inorganic
(C) Heterogeneous
(D) Heterocyclic
(E) Answer not known

55. Ultrasound can be used to assess the ———————— content of animal carcasses

(A) Protein
(B) Fat
(C) Mineral
(D) Vitamin
(E) Answer not known

56. FTIR is used to study the organization of foods and the stability of ————————, and to identify and quantitate extraneous matter

(A) Emulsions
(B) Elements
(C) Constituents
(D) Compounds
(E) Answer not known

57. The Polymerase Chain Reaction (PCR) consisting of 3 cyclic steps termed as denaturation, annealing and extension followed by stopping the reaction are operated at specific temperatures using a thermocycler. List out the correct sequence of temperatures used for setting up a PCR

(A) 4 to 10°C – 95°C – 50°C – 68 to 72°C
(B) 68 to 72°C – 50°C – 95°C – 4 to 10°C
(C) 50°C – 95°C – 68 to 72°C – 4 to 10°C
(D) 95°C – 50°C – 68 to 72°C – 4 to 10° C
(E) Answer not known

58. The gene expression studies are performed by using a technique called

(A) Polymerase chain reaction

(B) Real time polymerase chain reaction

(C) Gel electrophoresis

(D) Spectrophotometry

(E) Answer not known

59. Radappertization without heating is known to sterilize foods there by extending the shelf life of sea foods, fruits and vegetables. It involves the process of

(A) Usage of safe chemicals to treat food

(B) Usage of acids to sterilize foods

(C) Usage of radiation sterilization

(D) Usage of peroxides for sterilization

(E) Answer not known

60. Hepatitis A virus transmitted by fecal contamination of food, drink or shell fish reproduce in ———————— organ of the human body

(A) Liver

(B) Small intestine

(C) Kidney's

(D) Spleen

(E) Answer not known

61. The standard determined for standardised whole Milk by EU legislation is

(A) Milk with its natural fat content

(B) Milk which has not been heated above 40°C

(C) Milk with a fat content of 3.5 g/100 g

(D) Milk with a fat content of minimum 1.5 g/100 g

(E) Answer not known

62. The most important factor that determines nutritional quality of milk is

(A) Fat

(B) SNF

(C) Both (A) and (B)

(D) Lactose

(E) Answer not known

63. FSSAI prohibits the sale of

(1) Cream not prepared, exclusively from milk

(2) Dahi or curd prepared from boiled, pasteurized or sterilized milk

(3) Skimmed milk as milk

(4) Cream which contains 30% of milk fat

(A) (1), (2), (3) and (4)

(B) (1), (3) and (4)

(C) (1) and (3)

(D) (1) and (4)

(E) Answer not known

64. Cleanliness of milk is determined by which of the following test

(A) Sediment test
(B) Visual test
(C) Organoleptic test
(D) Alcohol test
(E) Answer not known

65. The nitrogen content in ice cream sample was estimated as 0.63 g. Determine the protein content

(A) 3.93 g
(B) 3.96 g
(C) 4.01 g
(D) 4.52 g
(E) Answer not known

66. Cream samples should be stored at a temperature of

(A) –5°C to 0°C
(B) 0°C to 5°C
(C) 5°C to 10°C
(D) 10°C to 15°C
(E) Answer not known

67. The starch content in ice cream is determined by multiplying total reducing sugars with

(A) 0.4
(B) 0.5
(C) 0.7
(D) 0.9
(E) Answer not known

68. State the reagent used for the enumeration of coliforms in dairy industry

(A) Glacial acetic acid
(B) Tryptone
(C) Violet red Bile Agar
(D) Manual pipette peptone
(E) Answer not known

69. Reagents required to detect the Ammonium compounds in milk are

(A) 1% sodium hydroxide, 2% sodium hypochlorite and 3% phenol solution
(B) 2% sodium hydroxide, 2% sodium hypochlorite and 5% phenol solution
(C) 4% sodium hydroxide, 2% sodium hypochlorite and 2% phenol solution
(D) 5% sodium hydroxide, 4% sodium hypochlorite and 4% phenol solution
(E) Answer not known

70. Milk fat agar is used for the enumeration of

(A) Lipolytic organisms
(B) Lactic organisms
(C) Non-lactic organisms
(D) Yeast and molds
(E) Answer not known

71. Heat stable proteolytic and lipolytic extracellular enzymes are produced by some of the psychotropic organisms leading to increase in bitterness, rancidity, in milk. Which organism is primarily involved?

(A) Escherichia coli
(B) Yersinia enterocolitica
(C) Salmonella typhi
(D) Pseudomonas fluorescens
(E) Answer not known

72. Which pathogenic bacteria serves as an indicator species for pasteurization of milk ensuring the other less heat resistant pathogens are readily destroyed by pasteurization

(A) Coxiella burnetti
(B) Chlamydia psitacci
(C) Serratia marcescens
(D) Legionella pneumophila
(E) Answer not known

73. The LP system exhibiting the bacteriocidal activity is present in high concentrations in Bovine milk. Identify the full form of LP system

(A) Lipo polysaccharide system
(B) Lipid protein system
(C) Lactoperoxidase/Thiocyanate/Hydrogen peroxide system
(D) Lactic acid-propionic acid system
(E) Answer not known

74. Alcohol test for milk, used to test the suitability for high heat process is referred as

(A) LTST

(B) Condensing and UHT

(C) High heat treatment

(D) Boiling

(E) Answer not known

75. What is the primary purpose of microbiological standards in dairy products?

(A) To ensure taste

(B) To ensure quality and safety of end products

(C) To ensure quantity

(D) To increase production of milk

(E) Answer not known

76. Which of the following is a standard for waste water treatment in dairy industries?

(A) Total suspended solids ≤100 mg/l

(B) Biological oxygen demand ≤50 mg/l

(C) Chemical oxygen demand ≤50 mg/l

(D) pH 6-8

(E) Answer not known

77. The oldest non-culture based diagnostic method used in microbiology is

(A) Compound microscopy
(B) Light microscopy
(C) X-ray microscopy
(D) Fluorescence microscopy
(E) Answer not known

78. State the estimated number of microorganisms in Aseptically drawn milk

(A) 500-1000 standard plate counts/ml
(B) 600-800 standard plate counts/ml
(C) 1000-10,000 standard plate counts/ml
(D) 6000-20,000 standard plate counts/ml
(E) Answer not known

79. The actual fluid milk shelf life is determined at the temperature of

(A) 8°C
(B) 7°C
(C) 10°C
(D) 20°C
(E) Answer not known

80. Adding cane sugar to curd (Dahi) can enhance its

(A) Acidity level
(B) Keeping quality
(C) Colour
(D) Thickness
(E) Answer not known

81. Identify the correct statements

A Sustainable food value chain is

(1) Profitable throughout all of its stages

(2) Broad benefits for society

(3) Has positive or neutral impact on the environment

(A) (1) and (2)

(B) (1) and (3)

(C) (2) and (3)

(D) (1), (2) and (3)

(E) Answer not known

82. Traceability in the food supply chain is beneficial in which of the following ways?

(1) Increased transparency

(2) More effective recalls

(3) Enhanced logistics

(A) (3) only

(B) (1) and (2)

(C) (1), (2) and (3)

(D) (2) and (3)

(E) Answer not known

83. When the sustainability in the food supply chain is measured in terms of labour conditions, pay scale, fair and ethical pricing, it is known as

(A) Economic sustainability
(B) Environmental sustainability
(C) Social sustainability
(D) Both (A) and (B)
(E) Answer not known

84. The food processors in the supply chain are facing which of the following challenges?

1. Scarcity of resources such as water and energy
2. Availability of fresh food from the producers

(A) (1) only
(B) (2) only
(C) Both (1) and (2)
(D) No challenges
(E) Answer not known

85. Expand HACCP

(A) Health Analysis and Critical Control Points
(B) Hazard Analysis Critical Control Points
(C) Hazard Analysis and Contamination Control Point
(D) Health Analysis and Critical Criteria Point
(E) Answer not known

86. Identify the correct pair

(1) IFS – International featured standards

(2) GFSI – Global food safety initiative

(3) QCI – Quality control institution

(A) (1) and (2)

(B) (1) only

(C) (1), (2), (3)

(D) (3) only

(E) Answer not known

87. The ERP system is build on a ———— utilizing a common computing platform.

(A) Centralised database

(B) Individual database

(C) Modular database

(D) Centralised layout

(E) Answer not known

88. Identify the web portal/App developed by FSSAI for consumers to raise concerns related to food safety and hygiene

(A) Food connect

(B) Food safety connect

(C) Food security connect

(D) Food quality connect

(E) Answer not known

89. The following is not a benefit of an ERP system

(A) Information integration
(B) Better customer satisfaction
(C) Reduced inventory
(D) Program management
(E) Answer not known

90. ERP use software application to ———————— the processes of an organization

(A) Automate
(B) Speed
(C) Grow
(D) Regulate
(E) Answer not known

91. Customer specific products are also known as

(A) Make-to-stock
(B) Make-to-order
(C) Goods
(D) Expected products
(E) Answer not known

92. The heart of an ERP system is

(A) Information
(B) Employees
(C) Customers
(D) Database
(E) Answer not known

93. A program designed to verify or examine a product a manufacturing process overtime is called as

(A) Quality control
(B) Quality audit
(C) Quality evaluation
(D) Quality assurance
(E) Answer not known

94. The sequence of a typical manufacturing supply chain is

(A) Storage-supplier-manufacturing-storage-distributor-Retailer-customer
(B) Supplier-storage-manufacturing-storage-distributor-retailer-customer
(C) Supplier-storage-manufacturing-distributor-storage-retailer-customer
(D) Supplier-storage-manufacturing-storage-retailer-distributor-customer
(E) Answer not known

95. The entities that purchase goods or services for their own use and their actions ripple throughout the supply chain. Identify this supply chain actor

(A) customer
(B) Manufacturer
(C) Retailer
(D) Wholesaler
(E) Answer not known

96. The practice of combating smaller shipments into a larger shipment to reduce transportation costs is

(A) Consolidation
(B) Cross-docking
(C) Direct shipping
(D) Pooling
(E) Answer not known

97. Market data analysis is done under

(A) Execution
(B) Strategy and planning
(C) Analysis
(D) Demand and supply chain management
(E) Answer not known

98. The sensor used in-line to continually monitor for potential problems in products is

(A) Electronic nose sensor
(B) Fill-level sensors
(C) Pack-dimension sensor
(D) Light-transmission sensor
(E) Answer not known

99. Importance of physical distribution system

(A) Creates time and place utility

(B) Stabilizes cost

(C) Improved customer services

(D) All of the above

(E) Answer not known

100. The distribution channel that helps the consumer goods to receive in hands is

(A) Manufacturer/producer to retailer to consumer

(B) Manufacturer/producer directly to consumer

(C) Manufacturer/producer to wholesaler to retailer to consumer

(D) Manufacturer/producer to agents to wholesaler to retailer to consumer

(E) Answer not known

101. The two main enzymes that rennet consists are

(A) Lipase and rennin

(B) Chymosin and pepsin

(C) Rennin and phosphotase

(D) Phosphotase and pepsin

(E) Answer not known

102. Accelerated flavour production without bitterness in cheddar type cheese is facilitated by the addition of ———— and ———— enzymes.

(A) Proteinases and peptidases
(B) Lipase and proteinases
(C) Lipase and α – amylase
(D) Serine proteases and α - amylase
(E) Answer not known

103. Raw milk contains several natural inhibitors of bacterial growth,

(i) Lactoperoxidase
(ii) Immunoglobulins
(iii) Lysozyme
(iv) Lactoferrin

Choose the correct option below

(A) Only (i) and (ii)
(B) Only (i) and (iii)
(C) Only (ii) and (iii)
(D) All (i), (ii), (iii) and (iv)
(E) Answer not known

104. Rennet coagulation

(i) Casein $\xrightarrow[\text{enzymatic phase}]{}$ Para casein + small peptides

(ii) Para casein + Small peptides $\xrightarrow[\text{non–enzymatic phase}]{}$ Coagulum (gel).

(A) Only (i) is correct
(B) Only (ii) is correct
(C) Both (i) and (ii) are correct
(D) Both (i) and (ii) are wrong
(E) Answer not known

105. The melting point of milk fat varies normally between

(A) 20 – 25°C
(B) –10°C to 10°C
(C) –40°C to 40°C
(D) 40 – 45°C
(E) Answer not known

106. The difference in UHT pasteurized milk and extended shelf life treated pasteurized milk is of

(A) Temperature of heating
(B) Holding time
(C) Microbial filteration
(D) Microbial contamination
(E) Answer not known

107. A ———— test helps in detecting the acidity in milk.

(A) Alcohol
(B) Lactometer
(C) Organoleptic
(D) Protein
(E) Answer not known

108. The inactivation of ———— is the main objective of commercial thermal processing of milk after the 1880s.

(A) Mycobacterium tuberculosis
(B) Streptococcus pneumoniae
(C) Escherichia coli
(D) Yersinia
(E) Answer not known

109. Choose the correct statements about centrifugal cream separation process

(i) The centrifuge consist of upto 120 discs stacked togather

(ii) Disc angle is 80 to 90 degree

(iii) Separation channel is maintained with 0.2 to 0.4 mm gap

(A) (i) only
(B) (i) and (ii) only
(C) (ii) and (iii) only
(D) (i) and (iii) only
(E) Answer not known

110. CIP liquids used in industrial sanitation process are expected to remove ———————— from the pipelines.

(A) Residual milk from the tanks and pipes.
(B) Solid deposits and Bacteria
(C) Trapped gases
(D) Unspent milk from storage vessels
(E) Answer not known

111. Match the following cheese varieties with their mode and characteristics of ripening

(a)	Cheshire cheddar	1.	Hard and mould ripening
(b)	Stilton	2.	Semi hard and bacterial ripening
(c)	Gouda Edam	3.	Soft and unripened
(d)	Cottage cheese	4.	Hard and bacterial ripening

	(a)	(b)	(c)	(d)
(A)	3	2	4	1
(B)	4	1	2	3
(C)	1	3	2	4
(D)	2	4	1	3

(E) Answer not known

112. Choose the right answer among type.

Which of the following statements are true about bactofugation process?

(i) Bactofugation is a non thermal technique, thus, different from pasteurisation.

(ii) Bactofugation will increase the shelf life of milk upto two to five days.

(iii) Bactofugation will not remove any aerobic spores

(A) (i) only
(B) (ii) only
(C) (ii) and (iii) only
(D) (i) and (ii) only
(E) Answer not known

113. An example of red seaweed from which carrageenans can be extracted?

(A) Gracilaria
(B) Gelidium
(C) Both (A) and (B)
(D) Laminaria
(E) Answer not known

114. A mixture of water and the wheat protein gluten that when cooked has a meat-like look and texture is known as

(A) Tofu
(B) Tempeh
(C) Lentil
(D) Seitan
(E) Answer not known

115. Starch derivatives like sorbitol and maltodextrin are used in the confectionary industry because they confer special characteristics like

(A) Improvement of shelf life
(B) Increase of nutritive value
(C) Both (A) and (B)
(D) Increase in drying rate
(E) Answer not known

116. The protein and fat % of the fermented milk product, kefir are

(A) 2.2 and 1.9 respectively
(B) 3 and 0.2 respectively
(C) 5 and 7.5 respectively
(D) 5 and 3.5 respectively
(E) Answer not known

117. A Greyish-White, chalky accumulation of dried milk solids and salts from hard water and washing solution is called as

(A) Milk layer
(B) Milk bubble
(C) Milk stone
(D) Milk bud
(E) Answer not known

118. A complex community of bacteria that get irreversibility attached to surface materials

(A) Biofilms
(B) Biomarkers
(C) Biopolymers
(D) None of the above
(E) Answer not known

119. The protein digested corrected Amino Acid Score of whey protein is

(A) 0.14
(B) 1.00
(C) 2.14
(D) 2.24
(E) Answer not known

120. Heat treatment of fat milk soil causes

(A) Caramelization, more difficult to clean
(B) Polymerization, more difficult to clean
(C) Denaturation, more difficult to clean
(D) Denaturation, easy to clean
(E) Answer not known

121. The processing time 12-D will reduce the amount of bacteria by ———————— level.

(A) 10^{12} bacteria per gram (B) 10^{20} bacteria per gram

(C) 10^{30} bacteria per gram (D) 10^{40} bacteria per gram

(E) Answer not known

122. Choose the right matches among the followings

(1) Cashew wine – Ancardium occidentale

(2) White grape wine – Vitis vinifera

(3) Red grape wine – Artocarpus heterophyllus

(4) Palm wine – Raphia vinifera

(A) (1), (2) and (3) are correct (B) (1), (2) and (4) are correct

(C) (2), (3) and (4) are correct (D) (1), (3) and (4) are correct

(E) Answer not known

123. Assertion [A] : Most aseptic packaging systems use hydrogen peroxide as sterilant.

Reason [R] : Heat, chemicals and radiation have been used for sterilization of aseptic packaging materials.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

124. The thermal death time of staphylococcus aureus is ———— at 60°C.

(A) 19 minutes
(B) 18 minutes
(C) 19 minutes 30 seconds
(D) 18 minutes 35 seconds
(E) Answer not known

125. Refrigeration influences agricultural and marketing practices by

(A) Increasing the nutrient value
(B) Maintaining the food supply uniformly throughout the year
(C) Denaturation of proteins
(D) Reduce post harvest losses
(E) Answer not known

126. The most important closure type used for metal containers is

(A) Single seam
(B) Double seam
(C) Triplet seam
(D) Quadruplet seam
(E) Answer not known

127. The film that is used for tamper-evident shrink bands is

(A) Polyethylene films
(B) Polypropylene films
(C) Edible films
(D) Printed PVC films
(E) Answer not known

128. A computer developed diagram shows that retailers how and where the products within a category should be displayed on a shelf at an individual stores is

(A) Monograms
(B) Planograms
(C) Hologram
(D) Hexagram
(E) Answer not known

129. Foil is annealed in an oven to control its ductility after ———— process.

(A) Coating
(B) Laminating
(C) Rolling
(D) Pressing
(E) Answer not known

130. Low density polyethylene is used in the packaging of foods for

(A) Being good barrier to gases
(B) Having low permeability to water vapour
(C) Its high tensile strength
(D) Its permeability to gases is high
(E) Answer not known

131. Paper made from cellulose type of pulp is weak and dull compared to the alternative chemical pulp because

(A) Ingredients are dissolved during digestion and removed in washing
(B) Due to weak hydrogen bonding
(C) Breakdown of sugars
(D) Low density and specific gravity
(E) Answer not known

132. The packaging format that is followed for breakfast cereals is

(A) Plastic laminated cartonboard
(B) Plastic film
(C) Tinplate cans
(D) Multi-wall paper sacks
(E) Answer not known

133. Food products like crisps and snack foods are packed in

(A) Polyethylene films
(B) Polypropylene films
(C) Polyvinylchloride films
(D) Polyvinylidene chloride films
(E) Answer not known

134. Without the preservatives ———————— would contaminate the juice, grows in the ambient storage conditions.

(A) Yeasts
(B) Moulds
(C) Yeasts and Moulds
(D) Bacteria
(E) Answer not known

135. The following technique is referred as intelligent packaging system is

(A) Biosensors
(B) Nanosensors
(C) Vacuum package
(D) Microwaveable package
(E) Answer not known

136. 5% Montmorilonites (MMT), a type of Nanofiller reduces water permeability upto ————————%

(A) 50%
(B) 60%
(C) 80%
(D) 90%
(E) Answer not known

137. The packaging material used in flexible packaging are

(A) Glass, Metal, Plastic container
(B) Lined carton, Glass, Metal
(C) Lined carton, Aluminium foil, Folding carton
(D) Plastic container, Aluminium foil, Lined carton
(E) Answer not known

138. For hurdle technology preserving fruits, the products are pasteurized in ———————— films and then enclosed in Al foil laminate packs to provide barrier against oxygen.

(A) Polyethylene films
(B) Polyvinyl films
(C) Polypropylene films
(D) Polyester films
(E) Answer not known

139. The following compound that is not used in ethylene scavenging mechanism of active packaging system

(A) Potassium permanganate
(B) Activated carbon
(C) Activated clay/zeolites
(D) Organic acids
(E) Answer not known

140. The ———————— method is followed to prevent spoilage of milk before distributed to the consumers.

(A) Boiling
(B) Sterilization
(C) Broiling
(D) Pasteurization
(E) Answer not known

141. Identify the wrong statement regarding entropy of steam

(A) Increases with addition of heat
(B) Increases during evaporation
(C) Super heating reduce the entropy
(D) Decreases with removal of heat
(E) Answer not known

142. The isothermal lines are drawn

(A) Below the saturation line only
(B) Above saturation line only
(C) Vertically
(D) Below and above saturation line
(E) Answer not known

143. The specific volume of water will ———————— when heated from 0°C.

(A) Increases steadily

(B) Decreases steadily

(C) First decreases and then increase

(D) First increase and then decrease

(E) Answer not known

144. The ratio of mass of actually dry steam to the mass of same quantity of wet steam is

(A) Wetness fraction

(B) Dryness fraction

(C) Critical point

(D) Dew point

(E) Answer not known

145. The difference between temperature of superheated steam and saturation temperature at given pressure is

(A) Dryness fraction

(B) Degree of super heat

(C) Degree of saturated heat

(D) Wetness fraction

(E) Answer not known

146. The enthalpy of wet steam is given by

(A) $h = h_f + xh_{fg}$

(B) $h = h_f + h_{fg}$

(C) $h = h_f + h_{fg} + c_p (t_{\text{sup}} - t)$

(D) $h = h_g + c_p\ (t_{\text{sup}} - t)$

(E) Answer not known

147. Calculate the dryness fraction of steam which has 1.5 kg of water in suspension with 50 kg of steam

(A) 0.83
(B) 0.97
(C) 0.68
(D) 1
(E) Answer not known

148. Vaporization in milk processing refers to

(A) Conversion of milk to steam for sterilization
(B) Evaporation of water content from milk
(C) Ultra rapid heating for instant pasteurization
(D) Separation of cream from milk
(E) Answer not known

149. The process of removing suspended particles in milk by applying centrifugal force is refered as

(A) Standardisation
(B) Collection
(C) Clarification
(D) Storage
(E) Answer not known

150. The minimum time to accomplish destruction of the micro organisms in milk is refered as

(A) Optimal Death Time
(B) Thermal Growth Time
(C) Optimal Growth Time
(D) Thermal Death Time
(E) Answer not known

151. Homogenization of milk is achieved by using temperature

(A) 10–20°C
(B) 15.7–16.7°C
(C) 55–70°C
(D) 70–95°C
(E) Answer not known

152. Recombined milk is made by

(A) Homogenizing whole milk
(B) Sterilizing milk at ultra high temperature
(C) Pasteurizing milk at low temperature
(D) Adding milk powder and buffer fat to water
(E) Answer not known

153. Stassanization in milk processing is refers to

(A) A form of pasteurization involving extremely high pressure
(B) The process of adding vitamins to milk
(C) An old form of sterilization
(D) A method of homogenization of milk
(E) Answer not known

154. A closed vessel used for generation of steam at desired temperature is

(A) Steam condenser
(B) Steam injector
(C) Steam boiler
(D) Steam engine
(E) Answer not known

155. Cornish boiler has ———————— flue tube/s.

(A) 1
(B) 2
(C) 3
(D) 4
(E) Answer not known

156. Feed check valve is

(A) A return valve
(B) Used to blow off mud
(C) Used to empty the boiler
(D) Used to regulate the supply of water into a boiler
(E) Answer not known

157. An economiser is a device used to

(A) Heat the feed water by utilizing the heat in exhaust flue gas
(B) Heat the feed water by utilizing the heat in the super heated steam
(C) Super heat the steam
(D) Heat the air
(E) Answer not known

158. Benson boiler is a

(A) High pressure fire tube boiler
(B) Low pressure water tube steam boiler
(C) High pressure water tube steam boiler
(D) High pressure natural circulation boiler
(E) Answer not known

159. Lancashire boiler is a

(A) Vertical water tube boiler
(B) Horizontal water tube boiler
(C) Vertical fire tube boiler
(D) Horizontal fire tube boiler
(E) Answer not known

160. A device attached to the steam chest for preventing explosions due to excessive internal pressure of steam is called

(A) Safety value
(B) Pressure gauge
(C) Fusible plug
(D) Water level indicator
(E) Answer not known

161. Neural network model is an example of

(A) Black box modelling
(B) Stochastic modelling
(C) Predictive modelling
(D) Inductive modelling
(E) Answer not known

162. Which of the following is a discrete distribution?

(A) Normal distribution
(B) Gamma distribution
(C) Poisson distribution
(D) Inverse gamma distribution
(E) Answer not known

163. Identify the correct statement

(A) In a system in equilibrium the properties are time variance

(B) In a system under steady state the properties are time invariance

(C) The properties of a system at equilibrium do not have propensity to change

(D) The time derivatives of all properties are non–zero in a steady state system

(E) Answer not known

164. A mechanistic model is one which is

(A) Based on underlying phenomena

(B) Based on input–output

(C) Dependent variables not function of special position

(D) Based on cause–effect analysis

(E) Answer not known

165. A very important difference between linear and non linear Internal Model Control (IMC) is

(A) Superposition principle

(B) Fick principle

(C) Fourier principle

(D) Distraction principle

(E) Answer not known

166. The method in which model equations are treated as non linear functions and a numerical method can be used to compute the inverse of these functions at each sampling instant is

(A) ANN
(B) Fourier Transform
(C) Wavelet Transform
(D) Dataset Transform
(E) Answer not known

167. A platform independent and can be used to develop either stand alone or web–based applications is

(A) FORTRAN
(B) C
(C) Pascal
(D) Java
(E) Answer not known

168. Programmers can define both the type of data structure and the types of operations with the data structure in

(A) Object oriented programming
(B) Linear programming
(C) Regression
(D) Non linear programming
(E) Answer not known

169. The quality attributes of beef used for classification are all of the following except

(A) Tenderness

(B) Flavour

(C) Water holding capacity

(D) Hardness

(E) Answer not known

170. The major advantage of electronic noses over conventional sensory panels is

(A) Sensitivity of analysis

(B) Continuous measurement

(C) Precision

(D) Reliability

(E) Answer not known

171. Identify the incorrect statement with regard to Partial Lease Squares (PLS)

(A) PLS algorithm uses score matrices to represent the data matrix

(B) Smaller components are left out as noise

(C) PLS model consists of regression between the scores of X and Y

(D) The number of components to be used is not important

(E) Answer not known

172. The method based on the presumption that "if a rule cannot classify properly on the original data used to build the rule, then there is a poor chance of doing well with a new data set" is

(A) Holdout method
(B) Cross validation method
(C) Resubstitution method
(D) Canonical correlation method
(E) Answer not known

173. Choose the right data set

(a)	Food quality process control	(1)	Image analysis
(b)	Food quality classification	(2)	Dynamic analysis
(c)	Pixel value	(3)	Static analysis

	(a)	(b)	(c)
(A)	3	2	1
(B)	2	3	1
(C)	1	2	3
(D)	3	1	2

(E) Answer not known

174. A classic tool used in signal preprocessing and analysis is

(A) Fourier transform
(B) Wavelet transform
(C) Xavier transform
(D) Fick's transform
(E) Answer not known

175. A tool to show qualitatively the connection between inputs and outputs is called

(A) Regression analysis
(B) Correlation analysis
(C) Colinear analysis
(D) linear analysis
(E) Answer not known

176. Identify the following which is not related to image intensity measurements

(A) Mean of image intensity
(B) Sample standard deviation of image intensity
(C) Total pixel count
(D) Ratio of Euclidean to linear distance of image intensity
(E) Answer not known

177. Identify the physical measurement method for the evaluation of food product quality

(A) Moisture
(B) pH
(C) Fiber
(D) Consistency
(E) Answer not known

178. The quantities of food quality indications can be predicted in one – step ahead or multiple step ahead modes based on

(A) Dynamic analysis
(B) Sampling
(C) Prediction
(D) Models
(E) Answer not known

179. If human operators are involved in the process control, they may be subject to ———————— to normal process variability

(A) dependent
(B) biased
(C) over correction and over reaction
(D) surrection
(E) Answer not known

180. The subjective methods for evaluation of food quality involve the following

(A) Trained panel
(B) Instrument
(C) Chemical
(D) Enzymes
(E) Answer not known

181. The 4 P's of marketing mix

(A) Product, price, place, promotion

(B) Product, position, place, promotion

(C) Packaging, publicity, place, price

(D) People, product, price, place

(E) Answer not known

182. If a company is measuring the success of the new product on a smaller scale before launching it on a rational or global scale, the process is termed as

(A) Commercialization

(B) Tent marketing

(C) Product launch

(D) Prototyping

(E) Answer not known

183. A company wants to know about people's knowledge, attitude, preference, buying behaviour. The tool that can be used is

(A) Survey

(B) Focus group interview

(C) Case study

(D) Interview

(E) Answer not known

184. The course of a products sales and profits over its life time

(A) Product life cycle
(B) Shelf life
(C) Market potential
(D) Product acceptance period
(E) Answer not known

185. Which of the following metallic ions has a potential for antimicrobial effect and is used in active packaging?

(A) Fe
(B) Ag
(C) Na
(D) Mg
(E) Answer not known

186. Identify the method

Delibrate inoculation of a food with relevant micro organisms followed by growth studies under controlled laboratory conditions.

(A) Challenge testing
(B) Shelf life trial
(C) Microbial trial
(D) Clinical trial
(E) Answer not known

187. If the number of samples is 10, what would be the degree of freedom for t–test?

(A) 9 (B) 8

(C) 7 (D) 6

(E) Answer not known

188. Which of the following is correctly paired in packaging?

(1) FFS – Form, fill and seal

(2) MAP – Modified atmospheric packaging

(3) CAS – Controlled air packaging

(A) (1) and (2) only

(B) (2) and (3) only

(C) (1) and (3) only

(D) (1), (2) and (3)

(E) Answer not known

189. The primary goal of food product development is

(A) To increase shelf life

(B) To create new and innovative food products

(C) To reduce production costs

(D) To enhance food safety

(E) Answer not known

190. Identify the main purpose of conducting market research in food product development

(A) To identify potential competitors of the product
(B) To analyze the production process of a food product
(C) To understand consumer needs and preferences
(D) To determine the nutritional value of the product
(E) Answer not known

191. The method used to ensure uniformity and consistency in food product quality during production is

(A) Sensory evaluation
(B) Quality control
(C) Market research
(D) Packaging design
(E) Answer not known

192. An interview with a customer to gather data usually takes

(A) One to two hours
(B) Four to five hours
(C) Whole day
(D) Many days
(E) Answer not known

193. The major carbonyl decomposition product of auto oxidised, polyunsaturated lipid materials is

(A) Maleic acid

(B) Malonaldehyde

(C) Butyric acid

(D) Butyraldehyde

(E) Answer not known

194. Kavitha is doing a test that consists of three food samples, two of which are the same and one that is different.

Choose the kind of sensory evaluation test Kavitha should opt for determining the odd one out

(A) Triangle test

(B) Duo–trio

(C) Single sample

(D) 9–point hedonic scale

(E) Answer not known

195. Match List I with List II :

List I	List II
(a) Chi–square	1. is used to determine the significance between group means
(b) t–test	2. A procedure to decompose variation into two or more independent variables
(c) ANOVA	3. Analyses the relationship between 2 or more independent variable and a single dependent variable
(d) Multiple regression	4. Produces a value that reflects relationship between expected and observed frequencies

	(a)	(b)	(c)	(d)
(A)	1	2	3	4
(B)	2	3	4	1
(C)	3	4	1	2
(D)	4	1	2	3

(E) Answer not known

196. In operations management DFA stands for:

(A) Design for assurance
(B) Design for accuracy
(C) Design for authenticity
(D) Design for assembly
(E) Answer not known

197. The most critical step in product development is

(A) Formulation
(B) Processing
(C) Screening
(D) Packaging
(E) Answer not known

198. The purpose of using binding agents in food formulations is

(A) To retain physical characterisation of food
(B) To improve texture and cohesion of food product
(C) To increase nutritional value of food
(D) To extend shelf–life of food product
(E) Answer not known

199. ———————— is a non–permitted color in food product development

(A) Ponceau
(B) Brilliant blue FCF
(C) Tartrazine
(D) Rhodamine
(E) Answer not known

200. Identify the steps in commercializing stage of new food product development

(1) Determining packaging

(2) Creating logo

(3) Pilot plant testing

(4) Finalizing cost

(5) Sourcing ingredients

(A) (1), (2), (4)
(B) (2), (3), (4)
(C) (3), (4), (5)
(D) (1), (2), (3)
(E) Answer not known