AP PGECET 2024 Food Technology Question Paper with Solutions

Time Allowed :2 hours	**Maximum Marks :**120	**Total Questions :**120

General Instructions

Read the following instructions very carefully and strictly follow them:

This question paper contains the following details:

1. The total duration of the examination is 2 hours.
2. The total number of questions is 120, carrying a maximum of 120 marks.
3. The question paper contains a single section:

   Food Technology
4. The marking scheme is as follows:

   (i) Each question carries 1 mark.

   (ii) There is no negative marking for incorrect responses.

   (iii) No marks will be awarded for unanswered questions.
5. The examination is conducted in Computer Based Test (CBT) mode.

1. Zeaxanthin is a

(1) Bacteriochlorophyll

(2) Carotenoid

(3) Steroid

(4) Protein

Correct Answer: (2) Carotenoid

Solution: Zeaxanthin is a type of carotenoid, which is a pigment found in plants and some other organisms. It plays a role in the plant's photosynthesis process and contributes to the coloration of fruits and vegetables.

Quick Tip

Carotenoids are a class of pigments responsible for the yellow, orange, and red colors in many fruits and vegetables. Zeaxanthin, specifically, is one of the carotenoids found in the retina of the eye.

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2. The disease pellagra is due to a deficiency of

(1) Vitamin C

(2) Biotin

(3) Folic acid

(4) Niacin

Correct Answer: (4) Niacin

Solution: Pellagra is a disease caused by a deficiency in niacin (vitamin B3). Niacin is essential for the body's metabolism and energy production. Symptoms of pellagra include dermatitis, diarrhea, and dementia, and the condition can be treated with niacin supplementation.

Quick Tip

Niacin is a water-soluble vitamin that plays an important role in converting food into energy. A lack of niacin in the diet can lead to pellagra, which is common in areas where maize (corn) is the primary food source.

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3. Enantiomers are

(1) Stereoisomers that are non-superimposable mirror images

(2) Optical isomers that are superimposable mirror images

(3) Stereoisomers that are non-superimposable and non-mirror images

(4) Isomers which differ in their configuration around a single carbon atom

Correct Answer: (1) Stereoisomers that are non-superimposable mirror images

Solution: Enantiomers are a pair of stereoisomers that are non-superimposable mirror images of each other. They have identical physical and chemical properties, except when interacting with other chiral molecules or plane-polarized light.

Quick Tip

Enantiomers are a special case of stereoisomers, where they differ in their spatial arrangement but cannot be superimposed on each other, like left and right hands.

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4. Rhombic plate like osazones are formed by

(1) Glucose

(2) Galactose

(3) Maltose

(4) Sucrose

Correct Answer: (2) Galactose

Solution: Osazone formation is a characteristic reaction of reducing sugars. When galactose is reacted with phenylhydrazine, it forms a rhombic plate-like structure, which is the characteristic feature of galactose's osazone.

Quick Tip

Osazones are compounds formed when reducing sugars react with phenylhydrazine, and their crystal form can help identify the sugar.

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5. Which of the following is true about the rancidity?

(1) Oxidation of oil present in food

(2) Reduction of oil present in food

(3) Oxidation of sugars present in food

(4) Reduction of sugars present in food

Correct Answer: (1) Oxidation of oil present in food

Solution: Rancidity refers to the chemical changes that cause the deterioration of oils and fats. It is most commonly caused by the oxidation of unsaturated fats in oils, leading to unpleasant odors and flavors.

Quick Tip

To prevent rancidity, oils can be stored in cool, dark places or be treated with antioxidants to slow down the oxidation process.

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6. The chemical formula of oleic acid is

(1) $C_{18}H_{32}O_2$

(2) $C_{18}H_{34}O_2$

(3) $C_{17}H_{34}O_2$

(4) $C_{17}H_{32}O_2$

Correct Answer: (2) $C_{18}H_{34}O_2$

Solution: Oleic acid is a monounsaturated omega-9 fatty acid. Its molecular formula is $C_{18}H_{34}O_2$, and it is commonly found in olive oil, avocados, and other plant oils.

Quick Tip

Oleic acid is important in nutrition and health, and it is known for its ability to lower levels of LDL cholesterol when consumed in moderation.

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7. Which among these is an index organism to find the efficacy of pasteurization is

(1) Staphylococcus aureus

(2) Mycobacterium tuberculosis

(3) Escherichia coli

(4) Bacillus cereus

Correct Answer: (4) Bacillus cereus

Solution: Bacillus cereus is commonly used as an indicator organism for evaluating the effectiveness of pasteurization. It is a heat-resistant bacterium and its presence after pasteurization indicates the process was insufficient.

Quick Tip

The use of Bacillus cereus as an index organism helps determine the temperature and time required to ensure the pasteurization process kills harmful microorganisms.

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8. The most abundant naturally occurring non-essential amino acid present in human body is

(1) Glutamine

(2) Histidine

(3) Leucine

(4) Threonine

Correct Answer: (1) Glutamine

Solution: Glutamine is the most abundant non-essential amino acid in the human body. It plays a key role in protein synthesis, immune function, and maintaining the acid-base balance in the body.

Quick Tip

Glutamine is particularly important in times of stress and is a preferred energy source for cells of the immune system.

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9. Which of the following is true about the myoglobin?

(1) Present in skeletal and cardiac muscle

(2) Present only in kidneys

(3) Present only in liver

(4) Present only in brain

Correct Answer: (1) Present in skeletal and cardiac muscle

Solution: Myoglobin is a protein found primarily in skeletal and cardiac muscles. It is responsible for storing and transporting oxygen within the muscles. It has a similar structure to hemoglobin but is more specialized for muscle cells.

Quick Tip

Myoglobin helps muscles by storing oxygen, allowing them to work more efficiently during activities that require intense effort.

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10. ..... is involved in vitamin A metabolism

(1) Tannins

(2) Beta Carotene

(3) Chlorophyll

(4) Anthocyanins

Correct Answer: (2) Beta Carotene

Solution: Beta-carotene is a precursor to vitamin A, which is involved in vision, immune function, and skin health. Beta-carotene is converted into retinol (vitamin A) in the body.

Quick Tip

Beta-carotene, found in orange and yellow vegetables like carrots, is converted to vitamin A in the body, which is crucial for eye health and immune function.

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11. Linalool is a

(1) Monoterpene

(2) Diterpene

(3) Triterpene

(4) Tetraterpene

Correct Answer: (1) Monoterpene

Solution: Linalool is a naturally occurring monoterpene alcohol found in many flowers and spice plants. It has a pleasant floral fragrance and is used in perfumes and aromatherapy.

Quick Tip

Monoterpenes like linalool are the building blocks of many essential oils and have various applications in medicine and fragrance.

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12. Identify the non-polar aliphatic amino acid

(1) Tryptophan

(2) Serine

(3) Histidine

(4) Valine

Correct Answer: (4) Valine

Solution: Valine is a non-polar aliphatic amino acid. It has a hydrophobic side chain and is one of the essential amino acids that must be obtained from the diet.

Quick Tip

Non-polar amino acids like valine tend to be found in the interior of proteins, away from the aqueous environment, due to their hydrophobic nature.

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13. Cellulose is a polymer of

(1) Branched chain of glucose monomers joined by β 1-4 glycosidic linkages

(2) Unbranched chain of glucose monomers joined by β 1-4 glycosidic linkages

(3) Branched chain of glucose monomers joined by α 1-4 glycosidic linkages

(4) Unbranched chain of glucose monomers joined by α 1-4 glycosidic linkages

Correct Answer: (2) Unbranched chain of glucose monomers joined by β 1-4 glycosidic linkages

Solution: Cellulose is a complex carbohydrate that consists of unbranched chains of glucose molecules linked by β-1,4-glycosidic bonds. This structure makes cellulose rigid and resistant to digestion by most organisms.

Quick Tip

Cellulose is a major structural component of plant cell walls. Its resistance to hydrolysis makes it important for plant rigidity.

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14. Ceramides are

(1) Protein synthesized by endoplasmic reticulum

(2) Sphingolipid synthesized by endoplasmic reticulum

(3) Carbohydrate synthesized by endoplasmic reticulum

(4) Sphingolipid synthesized by Golgi apparatus

Correct Answer: (2) Sphingolipid synthesized by endoplasmic reticulum

Solution: Ceramides are a class of sphingolipids formed by the linkage of sphingosine to a fatty acid. They are synthesized in the endoplasmic reticulum and play key roles in cell signaling and the formation of the skin's barrier.

Quick Tip

Ceramides are involved in maintaining the structural integrity of cell membranes and play a role in regulating cell apoptosis and differentiation.

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15. Which of the following is the precursor of testosterone?

(1) Cholesterol

(2) Terpenoid

(3) Thyroxine

(4) Glucose

Correct Answer: (1) Cholesterol

Solution: Testosterone is a steroid hormone synthesized from cholesterol. Cholesterol serves as the precursor molecule for the synthesis of many steroid hormones, including testosterone.

Quick Tip

Cholesterol is a key molecule in the body's biosynthesis of steroid hormones, including cortisol, estrogen, and testosterone.

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16. In an α-helix hydrogen bonds are present

(1) Between chains that run side by side

(2) Only between amino acids of opposite charge

(3) Within a single chain

(4) Between polar amino acid and water

Correct Answer: (3) Within a single chain

Solution: In an α-helix structure, hydrogen bonds are formed between the amino hydrogen of one amino acid and the carbonyl oxygen of an amino acid four residues ahead in the polypeptide chain. This bond helps stabilize the helical structure.

Quick Tip

The α-helix is a common secondary structure in proteins, where hydrogen bonds between atoms in the polypeptide backbone stabilize the helical shape.

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17. Which of the following has the lowest melting point?

(1) Fatty acids with sites of unsaturation with cis double bonds

(2) Fatty acids with sites of unsaturation with trans double bonds

(3) Fatty acids with no sites of unsaturation

(4) Fatty acids with longer hydrophobic tails

Correct Answer: (1) Fatty acids with sites of unsaturation with cis double bonds

Solution: Fatty acids with cis double bonds have kinks in their structures that prevent tight packing, leading to lower melting points. In contrast, trans double bonds or saturated fatty acids pack more tightly and have higher melting points.

Quick Tip

Fatty acids with cis double bonds are typically liquid at room temperature, while those with trans double bonds or no double bonds are usually solid.

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18. Which of the following is not true about the following?

(1) Chlorophyll ‘b’ contains aldehyde groups in their side chains

(2) Chlorophyll ‘a’ contains methyl groups in their side chains

(3) Chlorophyll ‘a’ contains aldehyde groups in their side chains

(4) Chlorophyll ‘a’ and chlorophyll ‘b’ contains the metal ion magnesium

Correct Answer: (3) Chlorophyll ‘a’ contains aldehyde groups in their side chains

Solution: Chlorophyll ‘a’ contains a methyl group, not an aldehyde group, in its side chains. Chlorophyll ‘b’ contains an aldehyde group. Both chlorophylls contain a magnesium ion at the center of their porphyrin ring structure.

Quick Tip

Chlorophyll is essential for photosynthesis, with chlorophyll ‘a’ directly involved in the light reactions and chlorophyll ‘b’ assisting in light absorption.

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19. The major component of bee wax is

(1) Triacontanoylpalmitate

(2) Tripalmitate

(3) Contanoyl acetate

(4) Diconanoylpalmitate

Correct Answer: (1) Triacontanoylpalmitate

Solution: Triacontanoylpalmitate is the major component of bee wax, a natural wax produced by honeybees. This compound consists of fatty acids combined with alcohols and other esters that contribute to the wax’s properties.

Quick Tip

Bee wax is used by bees to build their hives and protect the honey. It is composed of long-chain esters and fatty acids like triacontanoylpalmitate.

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20. Identify the amino acid with imino acid group

(1) Histidine

(2) Glycine

(3) Alanine

(4) Proline

Correct Answer: (4) Proline

Solution: Proline is the only amino acid that contains an imino group (a secondary amine), making its structure unique among the standard amino acids.

Quick Tip

The imino group in proline makes it a cyclic amino acid, which influences its role in protein structure, particularly in turns and bends in polypeptides.

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21. The component of coenzyme A is

(1) Folic acid

(2) Biotin

(3) Pantothenic acid

(4) Pyridoxine

Correct Answer: (3) Pantothenic acid

Solution: Pantothenic acid, also known as vitamin B5, is a component of coenzyme A. Coenzyme A plays an essential role in metabolic processes, including the citric acid cycle and fatty acid metabolism.

Quick Tip

Pantothenic acid is found in a variety of foods, including meat, eggs, and legumes, and is crucial for energy production in the body.

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22. Polyphenol oxidase is an enzyme that leads to

(1) Enzymatic browning of fruits and vegetables

(2) Enzymatic conversion of proteins into fats in fruits

(3) Enzyme that protects the fruits taste

(4) Enzyme that is used for artificial ripening of fruits

Correct Answer: (1) Enzymatic browning of fruits and vegetables

Solution: Polyphenol oxidase catalyzes the oxidation of polyphenols in fruits and vegetables, leading to the formation of brown pigments, which is known as enzymatic browning. This reaction is responsible for the color change in many cut fruits.

Quick Tip

To prevent enzymatic browning, fruits and vegetables can be treated with antioxidants like ascorbic acid or kept in low temperatures.

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23. Kwashiorkor is a nutritional deficiency disorder occurs due to lack of ..... in diet

(1) Fats

(2) Carbohydrates

(3) Minerals

(4) Proteins

Correct Answer: (4) Proteins

Solution: Kwashiorkor is a condition caused by a severe deficiency of protein in the diet, usually occurring in children. It leads to symptoms like edema, stunted growth, and weakened immune function.

Quick Tip

Kwashiorkor is different from marasmus, which is a deficiency of both protein and calories. Ensuring adequate protein intake is crucial for growth and development.

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24. Adding micronutrients deliberately to the food products that are in deficit in the diet of a given population so as to correct or prevent identified deficiency and improve the health of individuals is known as

(1) Food fortification

(2) Food fruitification

(3) Food rancidity

(4) Food blanching

Correct Answer: (1) Food fortification

Solution: Food fortification is the process of adding essential nutrients to food to prevent or

correct deficiencies in a population. Common examples include adding iodine to salt or vitamin D to milk.

Quick Tip

Fortified foods are essential in addressing common deficiencies, particularly in areas where the diet lacks variety or key nutrients.

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25. Microorganisms destroyed using thermal methods follows which order kinetics

(1) Zero order

(2) Second order

(3) First order

(4) Both zero order and first order

Correct Answer: (3) First order

Solution: Microorganisms typically follow first-order kinetics when destroyed by thermal methods, meaning the rate of destruction is proportional to the remaining population of microorganisms.

Quick Tip

First-order kinetics for microbial destruction indicates that as the microbial population decreases, the rate of destruction also decreases at a constant rate.

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26. Clostridium botulinum is a

(1) Gram negative, spherical-shaped, spore forming, aerobic bacteria

(2) Gram positive, rod-shaped, spore forming, anaerobic motile bacteria

(3) Gram positive, rod-shaped, non-spore forming bacteria

(4) Gram positive, spherical-shaped, anaerobic, non-motile bacteria

Correct Answer: (2) Gram positive, rod-shaped, spore forming, anaerobic motile bacteria

Solution: Clostridium botulinum is a Gram-positive, spore-forming, rod-shaped bacterium that grows in anaerobic conditions and produces botulinum toxin, which causes botulism.

Quick Tip

Clostridium botulinum is commonly found in soil and can contaminate improperly canned or preserved foods, leading to foodborne botulism.

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27. Aflatoxins are produced by

(1) Aspergillus flavus

(2) Shigella dysenteriae

(3) Salmonella typhimurium

(4) Escherichia coli

Correct Answer: (1) Aspergillus flavus

Solution: Aflatoxins are toxic compounds produced by Aspergillus flavus and other Aspergillus species. These toxins can contaminate crops like peanuts and corn and pose serious health risks, including liver damage and cancer.

Quick Tip

Aflatoxins are regulated in food products due to their carcinogenic and toxic effects, making their detection and prevention critical in food safety.

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28. Sauerkraut is a

(1) Fermented product of cabbage

(2) Fermented product of garlic

(3) Fermented product of potato

(4) Fermented product of onions

Correct Answer: (1) Fermented product of cabbage

Solution: Sauerkraut is a type of fermented cabbage, typically made by fermenting shredded cabbage with lactic acid bacteria, which gives it its characteristic sour taste.

Quick Tip

Sauerkraut is rich in probiotics and is commonly consumed for its digestive health benefits, as the fermentation process increases the nutrient availability.

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29. ..... is the portion of the growth curve where rapid growth of bacteria is observed

(1) Lag phase

(2) Logarithmic phase

(3) Stationary phase

(4) Decline phase

Correct Answer: (2) Logarithmic phase

Solution: The logarithmic phase (or exponential phase) is the part of the bacterial growth curve where cells divide at a constant rate, leading to rapid population growth. This phase follows the lag phase, where bacteria adapt to their environment.

Quick Tip

The logarithmic phase is crucial for antibiotic testing because bacteria are most vulnerable during this period of active growth.

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30. Which of the following is true about tannins

(1) $FeCl_3$ test is used to detect tannins

(2) Salkowski's test is used to detect tannins

(3) Libermann-Buchard's test is used to detect tannins

(4) Biuret test is used to detect tannins

Correct Answer: (1) $FeCl_3$ test is used to detect tannins

Solution: The $FeCl_3$ test is a common method for detecting tannins. When $FeCl_3$ is added to a solution containing tannins, it forms a blue-black or greenish color, indicating the presence of tannins.

Quick Tip

Tannins are polyphenolic compounds found in plants and are known for their ability to bind to proteins and other organic molecules.

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31. Which bacteria gives a positive reaction towards methyl red test

(1) Enterobacter aerogenes

(2) Escherichia coli

(3) Aspergillus niger

(4) Klebsiella pneumoniae

Correct Answer: (1) Enterobacter aerogenes

Solution: The methyl red test detects the ability of bacteria to ferment glucose and produce stable acids. Enterobacter aerogenes gives a negative result, but Escherichia coli and other bacteria can give a positive result, indicating mixed acid fermentation.

Quick Tip

The methyl red test is often used in combination with other tests in the IMViC series for bacterial identification.

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32. Which of the statements is true about the structure of fungi

(1) Chitinous cell walls, plasma membranes containing ergosterol, and 80S rRNA

(2) Non-chitinous cell walls, plasma membranes containing ergosterol, and 70S rRNA

(3) Chitinous cell walls, plasma membranes containing sugars, and 70S rRNA

(4) No cell walls and plasma membranes

Correct Answer: (1) Chitinous cell walls, plasma membranes containing ergosterol, and 80S rRNA

Solution: Fungi have chitinous cell walls, which provide structural support. Their plasma membranes contain ergosterol, a component that plays a role similar to cholesterol in animal cells. They also contain 80S ribosomes, characteristic of eukaryotes.

Quick Tip

The presence of ergosterol in fungal membranes makes it a target for antifungal drugs, which inhibit ergosterol synthesis.

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33. In Gram's staining technique, which acts as a mordant

(1) Alcohol

(2) Iodine

(3) Saffranine

(4) Crystal violet

Correct Answer: (2) Iodine

Solution: In Gram's staining technique, iodine acts as a mordant by forming a complex with crystal violet, which helps the dye penetrate the bacterial cell walls and retain the color during washing.

Quick Tip

Iodine is crucial in Gram's staining as it helps the crystal violet stain to adhere more strongly to the bacterial cells, making the distinction between Gram-positive and Gram-negative bacteria clearer.

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34. Mycolic acid is a characteristic feature of

(1) Mycobacterium tuberculosis

(2) Staphylococcus aureus

(3) Salmonella typhimurium

(4) Bacillus subtilis

Correct Answer: (1) Mycobacterium tuberculosis

Solution: Mycolic acid is a waxy lipid found in the cell walls of Mycobacterium species, including Mycobacterium tuberculosis. This feature gives the bacteria its unique resistance to acid and dehydration.

Quick Tip

The high lipid content in the cell walls of Mycobacterium species makes them resistant to decolorization during the acid-fast stain.

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35. Identify the correct sequence of products during wine preparation

(1) Glucose → pyruvic acid → acetaldehyde → ethyl alcohol

(2) Glucose → acetaldehyde → pyruvic acid → ethyl alcohol

(3) Glucose → acetaldehyde → ethyl alcohol

(4) Glucose → pyruvic acid → ethyl alcohol

Correct Answer: (1) Glucose → pyruvic acid → acetaldehyde → ethyl alcohol

Solution: During wine fermentation, glucose is first converted into pyruvic acid by glycolysis, then pyruvic acid is decarboxylated to form acetaldehyde. Finally, acetaldehyde is reduced to ethanol (ethyl alcohol) by yeast.

Quick Tip

Fermentation by yeast converts sugar into alcohol and carbon dioxide, which is essential in wine and beer production.

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36. Acetobacter aceti is used in the preparation of

(1) Beer

(2) Vinegar

(3) Cheese

(4) Soya sauce

Correct Answer: (2) Vinegar

Solution: Acetobacter aceti is a bacterium that converts ethanol into acetic acid, which is the main component of vinegar. This fermentation process is essential in the production of vinegar from alcoholic liquids.

Quick Tip

Acetobacter aceti thrives in oxygen-rich environments, making it ideal for vinegar production where alcohol is converted to acetic acid.

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37. Acid fast staining method includes which of the following

(1) Methyl red

(2) Safranine

(3) Crystal violet

(4) Carbol fuchsin

Correct Answer: (4) Carbol fuchsin

Solution: In the acid-fast staining method, carbol fuchsin is used as the primary stain. It binds strongly to the cell wall of acid-fast bacteria, such as Mycobacterium species, allowing them to retain the red color after washing.

Quick Tip

Carbol fuchsin is key in differentiating acid-fast bacteria from non-acid-fast bacteria. The red color produced is resistant to decolorization by acid-alcohol.

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38. Which is important to create an effective food safety management system

(1) Hazard analysis and critical control points

(2) Hazard approval and crucial contain points

(3) Hazard analysis and critical common perspectives

(4) Hazard analysis and critical common points

Correct Answer: (1) Hazard analysis and critical control points

Solution: Hazard analysis and critical control points (HACCP) is a systematic preventive approach to food safety. It identifies physical, chemical, and biological hazards and implements control measures at critical points in food production.

Quick Tip

HACCP is essential in ensuring food safety, helping identify and control risks in food production, packaging, and processing.

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39. Which of the following is true ISO 22000

(1) ISO 22000 is a policy developed to promote industries excluding food industry

(2) ISO 22000 requires that the food safety policy be supported by measurable objectives rather than being used as a framework for establishing objectives

(3) ISO 22000 is a policy equivalent to ISO 9001

(4) ISO 22000 is policy developed to promote leather industry

Correct Answer: (1) ISO 22000 is a policy developed to promote industries excluding food industry

Solution: ISO 22000 is a standard that ensures food safety throughout the food supply chain. It is applicable to all organizations in the food chain, regardless of their size or complexity.

Quick Tip

ISO 22000 outlines the requirements for a food safety management system, covering all aspects from farm to fork, to ensure food safety at every stage.

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40. National Food Laboratory, Ghaziabad is

(1) No accreditation is required

(2) Accredited by National Accreditation Board of Testing and Calibration Laboratories and

(3) Recognized by Food Safety and Standards authority of India

(4) Accredited by Council of Scientific and Industrial Research

Correct Answer: (4) Accredited by Council of Scientific and Industrial Research

Solution: The National Food Laboratory in Ghaziabad is accredited by the Council of Scientific and Industrial Research (CSIR) and follows recognized standards for food safety testing and research.

Quick Tip

Accreditation by bodies like CSIR ensures the laboratory's reliability in providing accurate and internationally recognized testing and research results.

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41. Consumer Protection Act was established in

(1) 1988

(2) 1986

(3) 1980

(4) 1978

Correct Answer: (2) 1986

Solution: The Consumer Protection Act was enacted in 1986 in India to protect the rights of consumers. It provides a mechanism for addressing grievances and disputes regarding defective goods, services, and unfair trade practices.

Quick Tip

The Consumer Protection Act is crucial in ensuring that consumers' interests are protected and they have a legal avenue for redressal.

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42. The length of time a food can be kept under stated storage conditions while maintaining its optimum safety and quality is known as

(1) Shelf life

(2) Half life

(3) Median life

(4) Mean life

Correct Answer: (1) Shelf life

Solution: Shelf life refers to the duration that a food product remains safe to consume and retains its quality when stored under specific conditions, such as temperature and humidity.

Quick Tip

Understanding shelf life is crucial for food safety, helping ensure that products remain safe and retain their taste and nutrition.

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43. Prevention of Food Adulteration Act was established in

(1) 1964

(2) 1954

(3) 1974

(4) 1984

Correct Answer: (2) 1954

Solution: The Prevention of Food Adulteration Act (PFA) was enacted in India in 1954 to regulate the quality of food and prevent adulteration. The act sets standards for food safety and defines penalties for violations.

Quick Tip

The PFA Act helps ensure that food products meet certain safety and quality standards, protecting consumers from unsafe or adulterated foods.

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44. The Recommended Dietary Allowance of vitamin E is

(1) 15 mg per day

(2) 50 mg per day

(3) 55 mg per day

(4) 60 mg per day

Correct Answer: (1) 15 mg per day

Solution: The Recommended Dietary Allowance (RDA) for vitamin E varies by age and sex. For adults, the RDA is 15 mg per day, as vitamin E is crucial for protecting cells from oxidative damage and maintaining immune function.

Quick Tip

Vitamin E is an important antioxidant that helps protect the body from oxidative stress. It is found in foods like nuts, seeds, and vegetable oils.

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45. Identify the probiotic bacteria

(1) Bifidobacterium longum

(2) Mycobacterium tuberculosis

(3) Rhizobium leguminosarum

(4) Campylobacter jejuni

Correct Answer: (1) Bifidobacterium longum

Solution: Bifidobacterium longum is a probiotic bacterium that is beneficial for the gut. It is commonly found in the intestines and helps in digestion by breaking down food and producing vitamins.

Quick Tip

Probiotics like Bifidobacterium longum support a healthy gut microbiome and can aid in digestion and immune system function.

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46. Isoflavone is a

(1) Terpenoid

(2) Phytoestrogen

(3) Saponin

(4) Vitamin B12

Correct Answer: (2) Phytoestrogen

Solution: Isoflavones are a class of phytoestrogens, which are plant-derived compounds that mimic the effects of estrogen in the body. They are found in foods like soybeans and are associated with various health benefits.

Quick Tip

Isoflavones, such as genistein and daidzein, are commonly found in soy products and may help with hormone balance.

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47. In kidneys, Vitamin D is converted into 1, 25 dihydroxyvitamin D through

(1) Carboxylation

(2) Nitration

(3) Deamination

(4) Hydroxylation

Correct Answer: (4) Hydroxylation

Solution: In the kidneys, vitamin D undergoes hydroxylation to form 1, 25-dihydroxyvitamin D, the active form of vitamin D, which is crucial for calcium and phosphate regulation in the body.

Quick Tip

The hydroxylation of vitamin D is a key step in its activation and is vital for bone health and the regulation of calcium metabolism.

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48. In accordance to the FSSAI rules, the following comes under class II preservatives

(1) Honey

(2) Vinegar

(3) Edible vegetable oil

(4) Sorbic acid including its salts

Correct Answer: (4) Sorbic acid including its salts

Solution: Sorbic acid and its salts are classified as class II preservatives according to FSSAI rules. These are commonly used in the food industry to prevent the growth of molds, yeasts, and bacteria, ensuring food safety.

Quick Tip

Sorbic acid is widely used in the food industry due to its ability to extend shelf life and prevent spoilage, particularly in baked goods, beverages, and dairy products.

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49. ..... conditions are considered as high temperature short time pasteurization of heating milk

(1) 71.7°C for 15 seconds

(2) 71.7°C for 15 minutes

(3) 71.7°C for 60 seconds

(4) 71.7°C for 30 minutes

Correct Answer: (1) 71.7°C for 15 seconds

Solution: High-temperature short-time (HTST) pasteurization is typically carried out at 71.7°C for 15 seconds, which is a method used to kill harmful microorganisms in milk while preserving its nutritional content.

Quick Tip

HTST pasteurization is used widely in the dairy industry to ensure milk safety while maintaining quality.

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50. The dimensions of kinematic viscosity are

(1) L^2T^{-1}

(2) L^1T^{-1}

(3) L^2T^{-2}

(4) L^1T^{-2}

Correct Answer: (1) L^2T^{-1}

Solution: Kinematic viscosity is defined as the ratio of dynamic viscosity to the fluid's density. Its dimensions are given as L^2T^{-1}, where L represents length and T represents time.

Quick Tip

Kinematic viscosity is used to characterize the flow of fluids and is important in areas like fluid mechanics and engineering.

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51. Cod liver oil is rich in

(1) Omega-3 fatty acids

(2) Palmitic acid

(3) Oleic acid

(4) Linolenic acid

Correct Answer: (1) Omega-3 fatty acids

Solution: Cod liver oil is a rich source of omega-3 fatty acids, which are essential for cardiovascular health, brain function, and reducing inflammation.

Quick Tip

Omega-3 fatty acids, found in cod liver oil and other fatty fish oils, are crucial for reducing the risk of heart disease and supporting brain health.

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52. Rumenic acid is a

(1) Conjugated hexadecenoic acid

(2) Conjugated heptadecenoic acid

(3) Conjugated linoleic acid

(4) Conjugated decadienoic acid

Correct Answer: (3) Conjugated linoleic acid

Solution: Rumenic acid is a form of conjugated linoleic acid (CLA), which is found in the fatty acids of ruminant animals like cows and sheep. It has potential health benefits including anti-cancer and anti-inflammatory properties.

Quick Tip

Conjugated linoleic acid, found in dairy and beef products, is known for its potential health benefits, including fat reduction and cancer prevention.

---

53. Alpha tocopherol contains

(1) Three methyl groups attached to chromanol ring

(2) One methyl group attached to chromanol ring

(3) Eight methyl groups attached to chromanol ring

(4) No methyl group attached to chromanol ring

Correct Answer: (1) Three methyl groups attached to chromanol ring

Solution: Alpha tocopherol, a form of vitamin E, contains a chromanol ring structure with three methyl groups attached, which contributes to its antioxidant properties.

Quick Tip

Vitamin E, including alpha tocopherol, plays a vital role in protecting cells from oxidative damage by neutralizing free radicals.

---

54. A glucosinolate present in white mustard

(1) Sinaplin

(2) Cobalamin

(3) Thiamine

(4) Aspargine

Correct Answer: (1) Sinaplin

Solution: Sinaplin is a type of glucosinolate found in white mustard seeds and is known for its bitterness and contribution to the pungency of mustard.

Quick Tip

Glucosinolates are natural compounds found in cruciferous vegetables, which, when broken down, contribute to the bitter taste and potential health benefits.

---

55. Codex Alimentarius Commission is an international food standard commission

(1) Established by FSSAI

(2) Established by HACCP

(3) Jointly established by Food and Agriculture Organization and the World Health Organization

(4) Jointly established by FSSAI and HACCP

Correct Answer: (3) Jointly established by Food and Agriculture Organization and the World Health Organization

Solution: The Codex Alimentarius Commission, established by FAO and WHO, develops international food standards to ensure food safety and quality worldwide.

Quick Tip

The Codex Alimentarius provides guidelines to protect consumer health and ensure fair practices in international food trade.

---

56. Blanching is a unit operation commonly used in vegetable processing is

(1) Chemical method to remove antioxidants from vegetables

(2) Heat sterilization method to inactivate deleterious enzymes prior to canning, freezing and drying

(3) Chilling method to remove water content from vegetables

(4) Moisturization method to increase fortification of vegetables

Correct Answer: (2) Heat sterilization method to inactivate deleterious enzymes prior to canning, freezing and drying

Solution: Blanching involves briefly heating vegetables to inactivate enzymes that can cause spoilage, preserving the color, flavor, and texture during storage, such as freezing or canning.

Quick Tip

Blanching is a critical step in preserving vegetables for long-term storage as it helps maintain quality by inactivating enzymes that could cause nutrient loss or spoilage.

---

57. Identify the descending order of the fatty acids in the refined corn oil

(1) PUFA ¿ MUFA ¿ SFA

(2) SFA ¿ PUFA ¿ MUFA

(3) PUFA ¿ SFA ¿ MUFA

(4) SFA ¿ MUFA ¿ PFA

Correct Answer: (1) PUFA ¿ MUFA ¿ SFA

Solution: Refined corn oil primarily consists of polyunsaturated fatty acids (PUFAs), followed by monounsaturated fatty acids (MUFAs) and saturated fatty acids (SFAs). The correct descending order is PUFA ¿ MUFA ¿ SFA.

Quick Tip

Polyunsaturated fats (PUFAs) are considered healthier than saturated fats (SFAs) because they help reduce the risk of heart disease when included in a balanced diet.

58. Corn gluten meal is a by-product of

(1) Wet milling of maize

(2) Wet milling of cabbage

(3) Wet milling of banana

(4) Wet milling of mangoes

Correct Answer: (1) Wet milling of maize

Solution: Corn gluten meal is a by-product of the wet milling process of maize (corn). It is a high-protein substance used in animal feed, particularly for livestock.

Quick Tip

Corn gluten meal is rich in protein and is often used as a supplement in animal feed and sometimes as a natural herbicide.

---

59. Beta-lactoglobulin is a major whey protein absent in

(1) Camel's milk

(2) Cow's milk

(3) Goat's milk

(4) Cow's milk and Goat's milk

Correct Answer: (1) Camel's milk

Solution:

Beta-lactoglobulin is a major whey protein found in the milk of cows, goats, and other mammals, but it is absent in camel's milk, making it the correct answer.

Quick Tip

Camel's milk lacks beta-lactoglobulin, which is a key protein present in other animal milk.

---

60. The formula for Newton's law of cooling is

(1) T(t) = (T - T) e^{kt}

(2) T(t) = T + (T - T)

(3) T(t) = T + (T - T) e^{kt}

(4) T(t) = T + (T - T) e^{kt}

Correct Answer: (4) T(t) = T + (T - T) e^{kt}

Solution:

Newton's law of cooling states that the temperature of an object is determined by the surrounding temperature and the difference between them. The correct formula is T(t) = T + (T - T) e^{kt}.

Quick Tip

In Newton's law of cooling, T represents the surrounding temperature, T is the initial temperature, and k is a constant specific to the object.

---

61. Indian Institute of Millets Research is located in

(1) Visakhapatnam, Andhra Pradesh

(2) Bengaluru, Karnataka

(3) Hyderabad, Telangana

(4) Chennai, Tamilnadu

Correct Answer: (3) Hyderabad, Telangana

Solution:

The Indian Institute of Millets Research (IIMR) is located in Hyderabad, Telangana.

Quick Tip

IIMR focuses on research related to millets and works towards improving their production and value in India.

---

62. Scientific name of black gram

(1) Vigna mungo

(2) Vigna radiata

(3) Cicer arietinum L.

(4) Cajanus cajan

Correct Answer: (1) Vigna mungo

Solution:

The scientific name of black gram is Vigna mungo, which is a commonly cultivated pulse in India.

Quick Tip

Black gram (Vigna mungo) is rich in protein and commonly used in Indian cuisine.

---

63. Hordeum vulgare is commonly known as

(1) Wheat

(2) Jowar

(3) Barley

(4) Red gram

Correct Answer: (3) Barley

Solution:

Hordeum vulgare is the scientific name of barley, a cereal crop commonly grown in temperate climates.

Quick Tip

Barley is widely used in brewing and as livestock feed.

---

64. Which of the following is used as sugar substitute in candies

(1) Ribitol

(2) Xylitol

(3) Inositol

(4) Mannitol

Correct Answer: (2) Xylitol

Solution:

Xylitol is commonly used as a sugar substitute in candies because it provides sweetness without the same calorie content as sugar.

Quick Tip

Xylitol is a sugar alcohol that is safe for most people and has a low glycemic index, making it a good alternative to sugar.

---

65. Which is known as invert sugar

(1) Glucose

(2) Fructose

(3) Sucrose

(4) Maltose

Correct Answer: (3) Sucrose

Solution:

Sucrose is known as invert sugar because it can be hydrolyzed into glucose and fructose, which are the two components that make up sucrose.

Quick Tip

Invert sugar is commonly used in the food industry for its ability to retain moisture and enhance sweetness.

---

66. The only carbohydrate which does not have any chiral carbon atoms is

(1) Dihydroxyacetone

(2) Erythrose

(3) Erythrulose

(4) Glyceraldehyde

Correct Answer: (1) Dihydroxyacetone

Solution:

Dihydroxyacetone is the only carbohydrate that does not have any chiral carbon atoms. This makes it different from other simple sugars.

Quick Tip

Chiral carbon atoms are those that are attached to four different groups, making them a center of optical activity.

---

67. Palmitic acid has

(1) 28 carbon atoms

(2) 32 carbon atoms

(3) 8 carbon atoms

(4) 16 carbon atoms

Correct Answer: (4) 16 carbon atoms

Solution:

Palmitic acid is a saturated fatty acid that contains 16 carbon atoms. It is one of the most common fatty acids found in animals and plants.

Quick Tip

Palmitic acid is commonly used in the production of soaps, cosmetics, and biofuels.

---

68. Marmalade is a

(1) Milk preserved product

(2) Sugar and juice preserved product

(3) Yeast preserved product

(4) Bacterial preserved product

Correct Answer: (2) Sugar and juice preserved product

Solution:

Marmalade is a fruit preserve made from citrus fruit, sugar, and water. It is a sugar and juice preserved product.

Quick Tip

Marmalade is usually made with oranges and contains both the juice and peel of the fruit.

---

69. The percentage of cinnamaldehyde in the essential oil of cinnamon bark

(1) 50

(2) 10

(3) 20

(4) 90

Correct Answer: (4) 90

Solution:

The essential oil of cinnamon bark contains approximately 90

Quick Tip

Cinnamaldehyde is responsible for the characteristic flavor and aroma of cinnamon.

---

70. Which of the following is not a millet

(1) Quinoa

(2) Bajra

(3) Kangni

(4) Jowar

Correct Answer: (1) Quinoa

Solution:

Quinoa is not a millet. While it is a grain and has similar nutritional benefits, it is botanically different from millets like Bajra, Kangni, and Jowar.

Quick Tip

Quinoa is often classified as a pseudo-cereal, not a true millet, and is gluten-free.

---

71. Enzymatic tenderization of meat uses

(1) Hydrolytic enzymes

(2) Lipolytic enzymes

(3) Glycolytic enzymes

(4) Proteolytic enzymes

Correct Answer: (4) Proteolytic enzymes

Solution:

Proteolytic enzymes are responsible for breaking down proteins in meat, which helps to tenderize it. These enzymes are commonly used in meat processing.

Quick Tip

Proteolytic enzymes such as papain and bromelain are frequently used in meat tenderization.

---

72. As per the FSSAI, the specification of total soluble solids in jam is

(1) 65%

(2) 10%

(3) 45%

(4) 5%

Correct Answer: (1) 65%

Solution:

The Food Safety and Standards Authority of India (FSSAI) specifies that the total soluble solids in jam should be 65% to meet the required consistency and quality.

Quick Tip

A higher percentage of total soluble solids in jam ensures better gel formation and a thicker consistency.

---

73. Which among the following are food adulterants

(1) Methane

(2) Hexane

(3) Ethylene

(4) Octane

Correct Answer: (3) Ethylene

Solution:

Ethylene is a food adulterant, commonly used for ripening fruits artificially. It is a naturally occurring gas but is used in food processing to induce ripening in various fruits.

Quick Tip

While ethylene is a natural plant hormone, its use as an adulterant to accelerate ripening can sometimes be harmful if not monitored properly.

---

74. Pulsed electric field technology is useful in

(1) Food preservation

(2) Food fortification

(3) Food rancidity

(4) Food adulteration

Correct Answer: (1) Food preservation

Solution:

Pulsed electric field (PEF) technology is mainly used in food preservation. It uses short bursts of high voltage to preserve food by destroying the microbial cells, helping maintain the nutritional value and flavor.

Quick Tip

PEF technology is a non-thermal method, which helps preserve the texture, color, and taste of food better than traditional methods.

---

75. The colour of star ruby grapefruit is due to

(1) Quercetin

(2) Resveratrol

(3) Ellagic acid

(4) Lycopene

Correct Answer: (4) Lycopene

Solution:

The color of star ruby grapefruit comes from lycopene, a red carotenoid pigment found in the fruit. Lycopene is also found in tomatoes and is known for its antioxidant properties.

Quick Tip

Lycopene is considered a powerful antioxidant and has been linked to a reduced risk of chronic diseases like heart disease and cancer.

---

76. Sublimation is a process of converting

(1) Solid to gaseous state

(2) Gaseous to liquid state

(3) Liquid to solid state

(4) Solid to solid state

Correct Answer: (1) Solid to gaseous state

Solution:

Sublimation is the process by which a substance transitions directly from a solid to a gas, bypassing the liquid phase. This occurs under specific temperature and pressure conditions.

Quick Tip

A common example of sublimation is the transformation of dry ice (solid CO) directly into carbon dioxide gas.

---

77. The fat content is in the range (high to low) of

(1) Whole milk ¿ butter milk ¿ skimmed milk

(2) Skimmed milk ¿ butter milk ¿ whole milk

(3) Butter milk ¿ whole milk ¿ skimmed milk

(4) Skimmed milk ¿ whole milk ¿ butter milk

Correct Answer: (1) Whole milk ¿ butter milk ¿ skimmed milk

Solution:

Whole milk has the highest fat content, followed by butter milk, and skimmed milk has the lowest fat content because it has most of the fat removed.

Quick Tip

Whole milk has a higher fat content, while skimmed milk is processed to remove most of its fat.

---

78. Which of the following statements is true about 'water in oil' emulsion

(1) Water will be the dispersion medium and oil will be the dispersion phase

(2) Both water and oil will be the dispersion phases

(3) Water will be the dispersion phase and oil will be the dispersion medium

(4) Both water and oil will be the dispersion medium

Correct Answer: (1) Water will be the dispersion medium and oil will be the dispersion phase

Solution:

In a water-in-oil emulsion, water is the dispersion medium and oil is the dispersion phase. This type of emulsion is commonly found in butter and some cosmetics.

Quick Tip

Water in oil emulsions are less stable than oil in water emulsions and are commonly used in food products like butter and margarine.

---

79. Foodborne pathogenic bacteria, Escherichia coli O157:H7, produces

(1) Shiga toxin

(2) Mycotoxin

(3) Aflatoxin

(4) Ricin

Correct Answer: (1) Shiga toxin

Solution:

Escherichia coli O157:H7 produces Shiga toxin, which can cause severe foodborne illness. This toxin can damage the intestinal lining and lead to symptoms like bloody diarrhea.

Quick Tip

Shiga toxin-producing E. coli is commonly found in contaminated meat, especially undercooked ground beef.

---

80. The maximum permissible limit of machine generating electron beams in food industry to inactivate microorganisms is

(1) 10 MeV

(2) 25 MeV

(3) 50 MeV

(4) 100 MeV

Correct Answer: (1) 10 MeV

Solution:

The maximum permissible limit of machine generating electron beams in the food industry is 10 MeV. This is used for the inactivation of microorganisms while maintaining food quality.

Quick Tip

Electron beam treatment is a non-thermal process that can be used to sanitize food products without affecting their taste or nutritional value.

---

81. The water activity range required for bacterial growth

(1) 1 to 0.75

(2) 10 to 15

(3) 15 to 25

(4) 25 to 30

Correct Answer: (1) 1 to 0.75

Solution:

Bacterial growth typically requires a water activity range between 0.75 and 1. Lower values (below 0.75) inhibit bacterial growth, which is important for food preservation.

Quick Tip

Water activity is crucial in food science for understanding microbial growth. Foods with lower water activity are less prone to spoilage.

82. Pectin is

(1) Anionic polysaccharide

(2) Cationic polysaccharide

(3) Amino acid

(4) Hormone

Correct Answer: (1) Anionic polysaccharide

Solution:

Pectin is an anionic polysaccharide commonly found in fruits. It is widely used as a gelling agent in food products like jams and jellies.

Quick Tip

Pectin is an important ingredient in the production of jams and jellies, as it helps achieve the desired texture.

---

83. Bottom fermenting yeasts produce larger beers at temperatures

(1) ¡ 15°C

(2) ¿ 15°C

(3) 25°C

(4) 35°C

Correct Answer: (1) ¡ 15°C

Solution:

Bottom-fermenting yeasts, which are typically used in lager beer production, work best at cooler temperatures, usually below 15°C, which helps in producing larger beers with a more refined flavor.

Quick Tip

Fermentation temperature plays a key role in the taste and quality of beer, with cooler temperatures often leading to a smoother, more flavorful lager.

---

84. Food rheology is a study of

(1) Bacteria in food materials

(2) Fungus in food materials

(3) Deformation and flow of foods under well-defined conditions

(4) Molds in food materials

Correct Answer: (3) Deformation and flow of foods under well-defined conditions

Solution:

Food rheology is the study of the deformation and flow behavior of food materials, including how foods respond to forces like stretching, compressing, or shearing, which is crucial in food processing.

Quick Tip

Rheological properties help in designing processes like mixing, heating, and packaging to improve food texture and quality.

---

85. Venturi meter works on

(1) Bernoulli's principle

(2) Pythagoras principle

(3) Sherwood number

(4) Biot number

Correct Answer: (1) Bernoulli's principle

Solution:

The Venturi meter is based on Bernoulli's principle, which relates the pressure difference in a fluid to its velocity. It is used for measuring fluid flow rate.

Quick Tip

The Venturi effect explains how the speed of a fluid increases as it passes through a constricted section of pipe.

---

86. The enthalpy of evaporation is a function of

(1) Weight

(2) Humidity

(3) Temperature

(4) Density

Correct Answer: (3) Temperature

Solution:

The enthalpy of evaporation depends on temperature. As the temperature increases, the energy required for the phase change from liquid to vapor (evaporation) also increases.

Quick Tip

The process of evaporation requires heat, which increases with the temperature of the substance.

---

87. The vapor pressure of water in a solution is always ..... the vapor pressure of pure water, when the temperature of both the solution and solvent are the same with the same external pressure acting over them

(1) Lower than the vapor pressure of pure water

(2) Higher than the vapor pressure of pure water

(3) Equal to the vapor pressure of pure water

(4) Perpendicular to the vapor pressure of pure water

Correct Answer: (1) Lower than the vapor pressure of pure water

Solution:

The vapor pressure of a solution is always lower than the vapor pressure of pure water due to the presence of solute particles that reduce the number of water molecules at the surface available for evaporation.

Quick Tip

The addition of a non-volatile solute to a solvent lowers the vapor pressure, a phenomenon known as Raoult's law.

---

88. Extrusion cooking is a

(1) Low temperature short time process

(2) High temperature long time process

(3) High temperature short time process

(4) Low temperature long time process

Correct Answer: (3) High temperature short time process

Solution:

Extrusion cooking is a high temperature short time process where raw ingredients are cooked by forcing them through a machine under pressure, resulting in a rapid cooking process.

Quick Tip

Extrusion cooking is widely used in the production of snacks, breakfast cereals, and other processed food products.

---

89. The possible relationship between relative centrifugal force and rotations per minute

(1) $g = rpm^2 \times r \times 1.118 \times 10$

(2) $g = rpm^2 \times r \times 1.118 \times 10$

(3) $g = rpm^2 \times r$

(4) $g = rpm^2 \times r^2 \times 1.118 \times 10$

Correct Answer: (1) $g = rpm^2 \times r \times 1.118 \times 10$

Solution:

The formula for relative centrifugal force (RCF) is $g = rpm^2 \times r \times 1.118 \times 10$, where rpm is the rotations per minute, r is the radius, and g is the centrifugal force. This is important for understanding the force experienced by particles in centrifuges.

Quick Tip

Understanding the relationship between rpm and centrifugal force is crucial in designing and optimizing centrifuges.

---

90. In food process engineering, the unsteady state of conductive heat transfer states that

(1) The changes in temperature depend only on the position

(2) The changes in temperature depend not only on the position but also on the time

(3) No changes in temperature

(4) The changes in temperature depend only on the time

Correct Answer: (2) The changes in temperature depend not only on the position but also on the time

Solution:

In unsteady-state conductive heat transfer, the temperature changes depend both on the position within the material and the time, making it a dynamic process.

Quick Tip

Unsteady-state heat transfer is crucial in food processing, as it determines how heat moves through food materials over time.

---

91. What happens when electromagnetic field is applied to the food materials containing water

(1) The water molecules orient themselves according to the polarity of the field

(2) The water molecules orient attains random orientation

(3) The water molecules evaporate during the process

(4) The water molecules orient did not show any polarity

Correct Answer: (1) The water molecules orient themselves according to the polarity of the field

Solution:

When an electromagnetic field is applied to food materials containing water, the water molecules align themselves according to the polarity of the field. This is essential in microwave heating.

Quick Tip

The orientation of water molecules in the presence of an electromagnetic field is a key factor in microwave heating.

---

92. During microwave processing of food materials

(1) Microwave energy itself is a thermal energy

(2) Heating is a consequence of light energy in a microwave

(3) No interactions between microwave energy and dielectric properties of food materials

(4) Heating is a consequence of interactions between microwave energy and dielectric properties of food materials

Correct Answer: (4) Heating is a consequence of interactions between microwave energy and dielectric properties of food materials

Solution:

Microwave heating in food processing occurs due to the interaction between microwave energy and the dielectric properties of food materials, leading to the generation of heat.

Quick Tip

The dielectric properties of food materials, such as water content, play a critical role in how efficiently they heat up in a microwave.

---

93. Milling process is linked to

(1) Expansion

(2) Size reduction

(3) Crystallization

(4) Extrusion

Correct Answer: (2) Size reduction

Solution:

Milling is primarily associated with size reduction of materials, breaking them down into smaller particles or powders.

Quick Tip

Milling is an important process in the food industry and in material processing, often used for grinding grains and other raw materials.

---

94. The process of food preservation using drying technique

(1) Reduces water activity

(2) Increases water activity

(3) No change in water activity

(4) No relation to water activity

Correct Answer: (1) Reduces water activity

Solution:

Drying reduces the water activity in food, which helps to prevent the growth of microorganisms and extends the shelf life of food products.

Quick Tip

Reducing water activity is one of the key principles in food preservation, along with refrigeration and canning.

---

95. Gerber centrifuge is used to

(1) Measure protein content in milk

(2) Measure carbohydrate content in milk

(3) Measure fat content in milk

(4) Measure bacteria in milk

Correct Answer: (3) Measure fat content in milk

Solution:

The Gerber centrifuge is specifically used to measure the fat content in milk by separating fat from the milk sample.

Quick Tip

The Gerber method is one of the most commonly used methods for determining fat content in milk and dairy products.

---

96. A dimensionless number which approximates the ratio of buoyancy force to viscous force is

(1) Grashof number

(2) Sherwood number

(3) Schmidt number

(4) Reynolds number

Correct Answer: (1) Grashof number

Solution:

The Grashof number is a dimensionless number that approximates the ratio of buoyancy force to viscous force in a fluid, important in natural convection problems.

Quick Tip

Grashof number is used in heat transfer calculations, especially in convective heat transfer problems.

---

97. A low Biot number ¡ 0.2 means

(1) Thermal conductivity of the object is low

(2) Thermal conductivity of the object does not change

(3) Thermal conductivity of the object is high

(4) Thermal radiation of the object is high

Correct Answer: (3) Thermal conductivity of the object is high

Solution:

A low Biot number indicates that thermal conductivity of the object is high, meaning heat is conducted efficiently through the material, leading to temperature uniformity.

Quick Tip

Biot number is a dimensionless number that helps to assess the relative importance of thermal resistance within the object compared to the convective resistance at the surface.

---

98. Specific heat is

(1) The quantity of heat that is gained or lost by a unit mass of product to accomplish a unit change in temperature, without a change in state

(2) The quantity of heat gained by a product with a change in state

(3) The quantity of heat lost by a product with a change in state

(4) The quantity of heat neither gained nor lost by a product

Correct Answer: (1) The quantity of heat that is gained or lost by a unit mass of product to accomplish a unit change in temperature, without a change in state

Solution:

Specific heat refers to the amount of heat energy required to raise the temperature of a unit mass of a substance by one degree Celsius without changing its state.

Quick Tip

Specific heat is an important property used in thermal processes and helps determine energy consumption in heating and cooling systems.

---

99. Plasmid is a

(1) Protein present in flagella of bacteria

(2) Outer membrane protein of bacteria

(3) Extrachromosomal DNA present in bacteria

(4) Lipopolysaccharide layer protein of bacteria

Correct Answer: (3) Extrachromosomal DNA present in bacteria

Solution:

Plasmid is a small, circular DNA molecule found outside of the chromosomal DNA in bacteria. It often carries genes that provide bacteria with a survival advantage.

Quick Tip

Plasmids are often used in genetic engineering for the transfer of genes between organisms.

---

100. Identify the correct match related to pyrometer

(1) High Pressure

(2) High Temperature

(3) High Humidity

(4) Low Pressure

Correct Answer: (2) High Temperature

Solution:

A pyrometer is a device used to measure high temperatures, typically in situations where direct contact with the material is not possible.

Quick Tip

Pyrometers are non-contact temperature sensors commonly used in industries such as metal processing and ceramics.

---

101. In steady state conditions, the flow behavior is characterized by

(1) Stress alone

(2) Deformation rate alone

(3) Independent of stress and deformation rate

(4) Both stress and deformation rate

Correct Answer: (4) Both stress and deformation rate

Solution:

In steady-state flow conditions, the flow behavior depends on both the applied stress and the deformation rate, and is often described using constitutive equations such as Newtonian or non-Newtonian models.

Quick Tip

Both stress and deformation rate are key factors in determining the flow behavior in materials, particularly in non-Newtonian fluids.

---

102. Which of the following statements is not correct

(1) Prokaryotes lack Golgi apparatus

(2) Prokaryotes contain 70S ribosome

(3) Transcription and translation occur in cytoplasm of prokaryotes

(4) The genetic material in prokaryotes is surrounded by nuclear membrane

Correct Answer: (4) The genetic material in prokaryotes is surrounded by nuclear membrane

Solution:

Prokaryotes do not have a nuclear membrane; instead, their genetic material is found in a region called the nucleoid. The other statements are true for prokaryotic cells.

Quick Tip

Prokaryotes lack membrane-bound organelles like the Golgi apparatus, which distinguishes them from eukaryotic cells.

---

103. A bacterial culture contained 32 × 10 cells after 2.5 hours of exponential growth. If the doubling time was 30 minutes, what was the initial population number in this culture?

(1) 20 × 10 cells

(2) 40 × 10 cells

(3) 16 × 10 cells

(4) 10 × 10 cells

Correct Answer: (4) 10 × 10 cells

Solution:

The population doubles every 30 minutes. After 2.5 hours (which is 5 doubling periods), the population increases by a factor of 2 = 32. Thus, the initial population was 32 × 10 / 32 = 10 × 10 cells.

Quick Tip

Exponential growth is characterized by doubling the population at regular intervals, making it easy to calculate initial populations.

---

104. ..... stain is used to detect endospores

(1) Crystal violet

(2) Malachite green

(3) Eosin

(4) Carbol Fuchsin

Correct Answer: (2) Malachite green

Solution:

Malachite green stain is used to detect bacterial endospores. It stains the endospores green, allowing them to be differentiated from the rest of the cell.

Quick Tip

Malachite green is commonly used in spore staining methods, and is often combined with heat for better penetration.

---

105. Triticale is a hybrid of

(1) Wheat and rye

(2) Oat and rye

(3) Millet and wheat

(4) Rice and wheat

Correct Answer: (1) Wheat and rye

Solution:

Triticale is a hybrid cereal grain, created by crossing wheat (Triticum) and rye (Secale), combining the yield potential of wheat with the hardiness of rye.

Quick Tip

Triticale is often used as animal feed and in some food products for its high protein content.

---

106. Fatty acid important for brain development

(1) Palmitic acid

(2) Linoleic acid

(3) Arachidonic acid

(4) Decosahexaenoic acid

Correct Answer: (4) Decosahexaenoic acid

Solution:

Decosahexaenoic acid (DHA) is an omega-3 fatty acid that is vital for brain development, especially during the early stages of life. It is essential for the structure and function of brain cells.

Quick Tip

DHA is found in high amounts in fish oils and is important for cognitive development and function.

---

107. Beriberi is due to the deficiency of

(1) Vitamin C

(2) Vitamin B5

(3) Vitamin B1

(4) Vitamin B12

Correct Answer: (3) Vitamin B1

Solution:

Beriberi is caused by a deficiency of Vitamin B1 (thiamine), which is essential for carbohydrate metabolism. It leads to nerve, heart, and muscular issues.

Quick Tip

A deficiency of thiamine can be treated with thiamine supplements or dietary changes, especially in people who consume a diet rich in refined grains.

---

108. World Food Day is celebrated every year on

(1) September 16

(2) October 16

(3) November 16

(4) December 16

Correct Answer: (2) October 16

Solution:

World Food Day is celebrated annually on October 16 to raise awareness about food security and efforts to combat hunger worldwide.

Quick Tip

World Food Day is marked by events, activities, and initiatives aimed at addressing food-related issues such as hunger and malnutrition.

---

109. Thyroxine contains ..... number of Iodine atoms

(1) 4

(2) 3

(3) 2

(4) 1

Correct Answer: (1) 4

Solution:

Thyroxine, also known as T4, contains 4 iodine atoms. It is produced in the thyroid gland and plays a major role in regulating metabolism.

Quick Tip

Thyroxine's iodine content is critical for its function in the body. Deficiency of iodine can lead to thyroid-related diseases.

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110. Avidin present in egg white is a .....

(1) Fat

(2) Carbohydrate

(3) Glycoprotein

(4) Biotin

Correct Answer: (3) Glycoprotein

Solution:

Avidin is a glycoprotein found in egg white. It binds to biotin (Vitamin B7), preventing its absorption and playing a role in nutrient regulation.

Quick Tip

Avidin is commonly used in molecular biology applications for its strong binding to biotin.

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111. Caffeine is .....

(1) 1,3,7 trimethylxanthine

(2) 1,3,7 tetramethylxanthine

(3) 1,3,7 pentamethylxanthine

(4) 1,3,7 hexamethylxanthine

Correct Answer: (1) 1,3,7 trimethylxanthine

Solution:

Caffeine is chemically known as 1,3,7 trimethylxanthine. It is a stimulant found in coffee, tea, and other beverages.

Quick Tip

Caffeine stimulates the central nervous system, which can improve focus and alertness.

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112. Staphylococcus aureus is

(1) Gram-positive spherically shaped bacterium

(2) Gram-negative spherically shaped bacterium

(3) Gram-positive rod-shaped bacterium

(4) Gram-negative rod-shaped bacterium

Correct Answer: (1) Gram-positive spherically shaped bacterium

Solution:

Staphylococcus aureus is a Gram-positive, spherical bacterium, commonly found on the skin and in the respiratory tract, and can cause various infections.

Quick Tip

Staphylococcus aureus is known for producing toxins that can lead to food poisoning and other infections.

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113. Christie–Atkins–Munch-Peterson test is related to

(1) Detect potassium in fruits

(2) Detect fat content

(3) Detect food flavours

(4) Identify bacteria

Correct Answer: (4) Identify bacteria

Solution:

The Christie–Atkins–Munch-Peterson test is used to identify the presence of certain bacteria, particularly those that are responsible for foodborne diseases.

Quick Tip

This test is used in microbiology to help identify pathogenic bacteria based on their specific characteristics.

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114. Mycoplasma is a

(1) Bacteria without cell wall

(2) Mold without cell wall

(3) Yeast without cell wall

(4) Virus

Correct Answer: (1) Bacteria without cell wall

Solution:

Mycoplasma are a group of bacteria that lack a cell wall. This characteristic makes them resistant to antibiotics that target cell wall synthesis.

Quick Tip

Mycoplasmas are the smallest known free-living organisms and are associated with various human diseases, particularly respiratory infections.

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115. The fermented wine prepared from cashew apple is

(1) Zinfandel

(2) Porto wine

(3) Feni

(4) Sauvignon Blanc

Correct Answer: (3) Feni

Solution:

Feni is a type of alcoholic beverage made from cashew apple, fermented and distilled in parts of India, particularly Goa.

Quick Tip

Feni is a traditional drink in Goa and is often made from either cashew apples or coconut sap.

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116. If the melting point of oils are high as compared to its surrounding temperature, then oils remain in

(1) Liquid state

(2) Solid state

(3) Gaseous state

(4) Vapour state

Correct Answer: (2) Solid state

Solution:

If the melting point of oils is high compared to the surrounding temperature, the oils will remain in the solid state because they will not reach their melting point under normal conditions.

Quick Tip

The state of oils depends largely on the ambient temperature in relation to the oil's melting point. Saturated oils, like coconut oil, can solidify at room temperature.

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117. Evaporation of water is

(1) An exothermic reaction

(2) A process during which neither heat is released nor heat is absorbed

(3) A process of chemical reaction

(4) An endothermic reaction

Correct Answer: (4) An endothermic reaction

Solution:

Evaporation of water is an endothermic process because it requires the absorption of heat from the surroundings to overcome the intermolecular forces in the liquid phase.

Quick Tip

Endothermic reactions absorb heat, while exothermic reactions release heat.

118. Black bread mold is caused by

(1) Aspergillus niger

(2) Saccharomyces cerevisiae

(3) Rhizopus stolonifer

(4) Penicillium notatum

Correct Answer: (3) Rhizopus stolonifer

Solution:

Black bread mold is caused by the fungus Rhizopus stolonifer, which grows on bread and other organic matter, appearing as a black growth.

Quick Tip

Rhizopus stolonifer is a common bread mold and is known for its rapid growth on bread in warm, moist environments.

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119. The pH of honey is

(1) ¡ 5.0

(2) ¿ 5.0

(3) = 7.0

(4) ¿ 9.0

Correct Answer: (1) ¡ 5.0

Solution:

Honey typically has a pH of around 3.5 to 4.5, which is acidic. This acidity helps preserve honey and protect it from bacteria and other microorganisms.

Quick Tip

Honey's acidic pH is one of the reasons why it is a natural preservative with antimicrobial properties.

120. Corrin ring is present in .....vitamin

(1) Vitamin B1

(2) Vitamin B2

(3) Vitamin B12

(4) Vitamin B5

Correct Answer: (3) Vitamin B12

Solution:

The corrin ring structure is present in Vitamin B12, which is essential for red blood cell formation and neurological function.

Quick Tip

Vitamin B12 is unique due to its corrin ring structure and plays a critical role in DNA synthesis and the production of red blood cells.