FSSAI
FAE

Previous Year Paper
30 July, 2021

7th FOOD ANALYST EXAMINATION (FAE-2021) &

4th JUNIOR ANALYST EXAMINATION (JAE-2021)

QUESTION PAPER A

Read the questions carefully and choose the correct answer.

This question papers contains 200 multiple choice questions

Each correct answer carries four marks and one mark will be deducted for each incorrect answer.

Q No	Question
1. 1	Which pair of government agencies share jurisdiction in the area of imported foods and food products? A. FSSAI &APEDA B. FSSAI& BIS C. Customs Department &FSSAI D. None of the above
2.	In India, the use of pesticides in Agriculture is regulated by the A. Central Insecticides Board & Registration Committee B. Food Safety and Standards Authority of India (FSSAI). C. Both A&B D. None of the above
3.	Which of these statements regarding the National Food Security Act, 2013 is incorrect? A. Provides subsidized food grains Public Distribution System B. Special focus on the nutritional support to women & children C. Coverage of up to 100% of the rural population and up to 75% of the urban population D. None of the above
4.	A food article sold in the market containing any inferior or cheaper substances whether wholly or partly, which is injurious to health under FSSR (2011) the product is considered as A. Sub-standard B. Unsafe C. Misbranded D. Partly sub-standard
5.	Which are the two countries, which have a common Food Standards A. UK and Ireland B. Argentina and Brazil C. Australia and New Zealand D. USA and Canada
6.	The most recently added commodity committee in Codex is A. Codex Committee on Fats and Oils B. Codex Committee on Processed Fruits and Vegetables C. Codex Committee on Spices and Culinary Herbs D. Codex Committee on Sugars

7.	The maximum dosage of irradiation permitted for Mango by FSSR is A. 0.09 KGy B. 0.75 KGy C. 0.09 Rad D. 0.75 Rad
8.	Which of these products does not fall under the category of foods under FSSA(I)? A. Chewing gum B. Whisky C. Tobacco D. Packaged drinking water
9.	Which of these acidity regulators are not permitted for use in foods by FSSA(I) A. Malic Acid B. Citric Acid C. Succinic acid D. Lactic acid
10.	Who is exempted from the FSSA (2006)? A. Petty shop owner B. Halwai C. Road side hawker D. Farmer
11.	In a laboratory investigation, a wheat sample contained Dhatura seeds. The sample is considered as A. Safe for human consumption B. Unsafe for human consumption C. Partially safe D. None of the above
12.	The FSSR (2011) for food labelling standards including claims on health, nutrition, special dietary uses and food category systems for foods is notified by A. Scientific Panel on Food Labelling B. Scientific Committee C. Food Safety and Standard Authority of India D. Central Advisory Committee of FSSAI
13.	Foreign starch found in a turmeric powder sample under FSSR (2011) will be considered as A. Safe B. Unsafe C. Misbranded D. Substandard
14.	Which of the following pairs is not correctly matched? A. BIS, Ministry of Consumer Affairs Food and Public Distribution B. Legal Metrology Act, Ministry of Consumer Affairs Food and Public Distribution C. Food Safety and Standards Act- 2006: Ministry of Food Processing D. None of the above
15.	Legal tools used by the Codex Commission to regulate food products among member nations is

	A. Food Standards B. Codes of Practice C. Guidelines and Recommendations D. All of the above
16.	Multi Source Edible Vegetable Oil is an admixture of any two refined edible vegetable oils except mustard oil, where the proportion by mass of any edible vegetable oil used in the admixture is A) not less than 30 per cent. B) not less than 20 per cent C) not less than 40 per cent D) no restrictions on blending
17.	Which of these spice pairs is incorrectly matched? A. Cumin Black (Kalonji): Seeds B. Cumin (Zeera): Fruits C. Clove (Laung): Unopened buds D. Saffron: Stamens
18.	The Standard Mark 'ISI' can be used on product(s) by all A. Leading food manufacturers in India B. All manufacturers of quality food products C. BIS Product Certification Licensee holders D. Traders selling quality products
19.	Acid insoluble ash is an indicator of contaminants in food such as A. Silicates B. Sand C. Glass powder D. All of the above
20.	If you were asked by the Food Safety Officer to indicate whether the sample is Khandsari Sugar (Sulphur Sugar) or Khandsari Sugar (Desi), which method would you use? A. Sulphated ash estimation B. Conductivity method C. LC-MS/MS D. ICP-MS
21.	Analysis of the proline content of honey is a measure of its A. Ripeness B. Shelf-life stability C. Added sugar D. None of the above
22.	JEMRA is the acronym for A. Joint FAO/WHO Expert Meetings on Microbiological Risk Analysis B. Joint Expert on Microbiological Risk Analysis C. Joint FAO/WHO Expert Meetings on Microbiological Risk Assessment D. None of the above
23.	Fruit Cheese is made from pasteurised Cow's milk A. True B. False
24.	Which of these Food Additives is not permitted for use in Pickles under FSSR (2011)?

	A. Class I preservative B. Class II preservative C. Synthetic Colors D. Acidity regulators
25.	In addition to obtaining an FSSA(I) license it is mandatory for the flavoured tea manufacturers before marketing must register themselves with A. Bureau of Indian Standards B. APEDA C. Directorate of Pesticides D. Tea Board of India
26.	The positive test for tricresyl phosphate in edible oil is a marker for the adulteration with A. Castor oil B. Tube oil C. Spent oil D. Mineral oil
27.	Consider the following statements 1. Technical Barriers to Trade (TBT) are the category of non-tariff barriers to trade under WTO agreements 2. TBT have the greatest impact on agriculture due to sanitary and phyto-sanitary measures designed to protect human, animal, and plants from diseases, pests and other contaminants Which of the following statement given above is/are correct? A. Only 1 B. Only 2 C. Both 1 and 2 D. Neither 1 nor 2
28.	Food business not falling under the purview of Central Licensing Authority are A. 100 % Export Oriented Units. B. All Importers importing food items C. Food Business Operator operating in two or more states. D. Petty Food Business operator
29.	Coffee, Tea and whole Spices are exempted from Nutrition Facts labelling in India. A. True B. False
30.	Pseudoallergic fish poisoning is due to the presence of A. Fish protein B. Scrombotoxins C. Both A&B D. None of the above
31.	The international organization which provides a setting where governments compare policy experiences, seeks answer to common problem, identify good practice and coordinate domestic and international policies is A. Codex Alimentarius Commission B. The Organization for Economic Cooperation and Development

	(OECD) C. World Organization of Animal Health (OIE) D. World Trade Organization (WTO)
32.	In all Thermally Processed Fruit Cocktail Packages it is mandatory to declare on the label A. Drained weight B. Pictures of the fruits used in the product C. Packing medium along with its strength D. All of the above
33.	Diacetyl, a flavour, may be added to Vanaspati exclusively meant for consumption by the A. School Children B. Pregnant women C. Armed Forces D. Immuno-compromised
34.	If the moisture content of whole wheat atta exceeds the prescribed maximum level of 14 % then there is a tendency for A) Extended Shelf life B) Decreased Shelf Life C) No change is visible D) None of the above
35.	The test used to detect insect infestation in cereals and their products is A. Peroxidase test B. Barfoed's Test C. Uric Acid test D. Baudouin Test
36.	The origin of animal meats as defined in the FSSR (2011) can be either A. Bovine, porcine B. Ovine, Suilline C. Caprine D. All of the above
37.	Which among these food additives is not permitted for Raisins under FSSR (2011)? A) Sulphur di oxide as a bleaching agent B) Colouring matter C) Artificial flavour D) All the above are permitted
38.	Methyl mercury and mercury are heavy metals for which there are prescribed limits under FSSR (2011). Which instrument technique is most suitable to differentiate between the two analytes? A. OES-ICP B. LC-IRMS C. LC-ICP-MS D. ICP-MS
39.	An irradiation facility for the treatment of food must have a A. Licensed under the Atomic Energy (Control of Irradiation of Food) Rules, 1991. B. Carry out irradiation in accordance with the provisions of the

	Atomic Energy (Control of Irradiation of Food) Rules,1991. C. Both A&B D. FSSA(I) License
40.	Neotame, an artificial sweetener is permitted for use only in A. Chocolate B. Carbonated water C. Dried ice cream mixes D. Frozen Dessert
41.	Which of these statements is incorrect about compound ingredients? A. If any of the ingredients is itself a product of two or more ingredients, such a compound ingredient must be listed and, in brackets, the composition of its ingredients: B. If the compound ingredient, constitutes less than 5% of the food, the list of ingredients of the compound ingredient, other than food additive, need not to be declared. C. A compound ingredient need not be declared if it constitutes less than 5% of the total D. The ingredients of the compound ingredient must be in descending order of weight.
42.	Which of the following is the best definition of a flow chart? A. A diagram used to structure ideas into useful categories B. An illustration used to analyze variation in a process C. A picture used to separate steps of a process in sequential order D. An analytical tool used to clarify opposing aspects of a desired change
43.	Which of the following methods is used to calculate expanded uncertainty? A. Dividing the combined standard uncertainty by the coverage factor B. Multiplying the combined standard uncertainty by the coverage factor C. Summing the combined standard uncertainty and the coverage factor D. Subtracting the coverage factor from the combined standard uncertainty
44.	The storage area of the traceable standards (weights, thermometers etc) must maintain proper control of its environment in order to A. Facilitate proper performance of calibrators B. Ensure peak performance of the test instruments C. Control humidity to be less than 20% D. Maintain a temperature of 25 ± 1 °C
45.	The extent to which an instrument replicates its result when measurements are taken repeatedly on the same unit is called: A. Real bias B. Precision C. Accuracy D. True value
46.	Which of the following functions are served by process audits? A. To identify low performing employees B. To ensure standardized quality practices

	C. To develop corrective actions D. To find non-compliant products
47.	Candela is the International System of Units measure for an object's A. ambient temperature B. amount of substance C. amount of mass D. luminous intensity
48.	A 250-psi pressure gauge has a specification of ± (0.5% of reading + 1% of full scale). What is the allowable error for this gauge when used at 78 psi? A. ±0.64 psi B. ±1.17 psi C. ±2.89 psi D. ±6.40 psi
49.	A calibration procedure lists the required standard plus the phrase "or equivalent." In this situation, which of the following is true about the equivalent standard in relation to the required standard? A. It is made by the same manufacturer. B. It has the same or later expiry date. C. It has the same or lower uncertainty. D. It has the same function and range
50.	An interlaboratory comparison program can be used for which of the following purposes? A. Create a data collection procedure for the laboratory B. Establish intervals for monitoring measurement equipment C. Assess a laboratory's competency to perform the test. D. Audit the laboratory's testing capabilities.
51.	Which of the following instruments is used to measure ambient dust levels in the laboratory? A. Air velocity meter B. Air quality meter C. Optical particle counter D. Optical air data sensor
52.	An ISO/IEC 17025:2017 accredited lab should maintain _____ for managerial, technical and key support personnel involved in tests. A. Current job descriptions and responsibilities B. No specific documents; since the job is ever-changing, nothing formal is required C. A calendar D. Attendance records.
53.	The ISO standards, which number in the thousands, are published by the A. Codex Alimentarius B. Food and Agriculture Organization C. International Standards Organization D. International Organization for Standardization
54.	The property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of

	comparisons all having stated uncertainties is called A. Chain of custody B. Traceability C. Compatibility D. None of the above
55.	Which of the following has the strongest influence on the variation of laboratory air density? A. Electromagnetic inference B. Humidity C. Mass D. Volume
56.	A 1:10 dilution of *E. coli* is made by aseptically adding 1 mL of the bacteria to 9 mL of buffered peptone water. The 1 mL is measured using a A. Class A pipette. B. Class B pipette C. Class A Sterile pipette D. None of the above
57.	What is the singular most potentially dangerous aspect of distillation? A. The reduced pressure required for the procedure B. The use of flammable materials in the presence of heat C. The exothermic nature of the reaction D. None of the above
58.	The CAS registry number of a chemical is A. a rating of toxicity B. a unique identifying number for each chemical C. a rating of flammability D. None of the above
59.	The quality standard for the laboratory-accrediting body in India 'National Accreditation Board for Testing and Calibration Laboratories, New Delhi' is: A. ISO 9001 B. ISO 15189 C. ISO 17011 D. None of the above
60.	Which of these statements is false with respect to test equipment of a lab that complies with ISO/IEC 17025? A. Ensure that all such equipment which affects accuracy are calibrated B. Own and control all of the equipment that it uses C. Attach a label to the equipment showing its calibration status D. Stop using the equipment if it is not operating correctly
61.	A "Class-A" fire extinguisher can be used to treat fires involving _____ as fuel sources. A. Ordinary combustibles (woods, plastics, etc.) B. Electrical equipment C. Combustible metals D. Flammable or combustible liquids

62.	The first artificial sweetening agent used in food was: A. Saccharine B. Cyclamates C. Aspartame D. Sucralose
63.	Jam, jellies and fruit preserves can be preserved by adding sugar at concentration of at least: A. 65% B. 70% C. 40% D. 30%
64.	Which of the following set of gases'composition is controlled during controlled atmospheric storage: A. $O_2 + N_2$ B. $CO_2 + N_2$ C. C_2H_4 + N2 D. $CO_2 + O_2$
65.	Which of the following methods is a quick test for sugar content during the early stages of the brewing process for beer? A. Hydrometry B. Babcock test C. Wet ashing D. Soxhlet extraction
66.	The extent to which migration occurs in food packages depends on the: A. physico-chemical properties of the migrant, of the packaging material, and the food (e.g. fat content) B. temperature C. storage time D. All of the above
67.	Irradiation processes are measured in terms of A. Kilohertz (kHz) B. Kilogray (kGy) C. Kilocm^{-1} (kcm^{-1}) D. Kilocal (kcal)
68.	Why is salt used to preserve meat? A. it makes the meat taste good B. it reduces the moisture content to prevent growth of microbes C. it promotes multiplication of beneficial microbes that prevent food spoilage D. it increases moisture content and helps prevent growth of microbes
69.	Post mortem changes in fish are due to A. Retrogradation B. Sterilization C. Autolysis D. None of the above

70.	When a food containing protein is cooked, there is an irreversible change in the structure of the protein. This change is called A. Syneresis. B. Denaturation. C. Gelatinisation. D. Emulsification
71.	A _____ is a brand that is given legal protection because, under the law, it has been appropriated by one seller. A. Generic name B. Trademark C. Family brand D. Grade label
72.	Vacreation refers to A. Vacuum packaging B. Vacuum creation C. Vacuum sterilization D. Vacuum pasteurization
73.	Which of the following is a rapid precooling method? A. Forced air Cooling B. Hydro Cooling C. Vacuum Cooling D. Evaporative Cooling
74.	The extent of chemical migration from packaging into food migrants are measured using food simulants. Which of these simulants is not correct? A. Migration into an oily food is measured with vegetable oil B. 10% ethanol or 3% acetic acid are used for water-based foods and drinks C. 50% ethanol solution is used for amphiphilic foods such as butter D. Dry foods are simulated using dry roasted nuts.
75.	Paper made from acid-treated pulp (passed through a sulfuric acid bath) is called A. Kraft paper B. Parchment paper C. Grease proof paper D. Glassine
76.	Which one of the following oligosaccharides contains α-linked sugars and is digestible by humans? A. Maltodextrins B. Raffinose C. Inulin D. Stachyose
77.	Which one of the following physiologically important classes of metabolites is produced by bacterial fermentation of non-digestible carbohydrates in the large intestine? A. Short-chain fatty acids B. Long-chain fatty acids

	C. Bile acids D. Amino acids
78.	The synthetic form of Vitamin K is called: A. Menaquinone B. Menadione C. Hydroquinone D. Phylloquinone
79.	An essential component of the mitochondrial electron transport system found naturally in the body is: A. 7-dehydrocholesterol B. Carnitine C. Coenzyme Q10 D. Menaquinones
80.	Which of these foods can be designated as a 'Food for Specified Health Use: A. An oat bran-enriched breakfast cereal B. A plant sterol-enriched margarine C. An isotonic sports' drink D. A hypoallergenic rice porridge
81.	Which vitamin acts as a methyl (CH3) group donor for the reconversion of homocysteine to methionine? A. Pantothenic acid B. Niacin C. Folate D. Biotin
82.	Which among the following is an intervention study? A. Ecological study B. Randomized controlled trial C. Cohort study D. Case–control study
83.	The major macronutrient needed to build and maintain the structural components of the body is: A. Carbohydrates B. Protein C. Fat D. None of the above
84.	A patient with gastric resection may need which supplement? A. Vitamin B12 B. Copper C. Vitamin B6 D. Zinc
85.	The zymogen of the enzyme trypsin is found in A. Pancreatic juice B. Saliva C. Bile juice D. Intestinal juice

86.	If the average energy content of one banana is 105 kcal, what is its energy content in kilojoules (kJ)? A. 25 B. 439 C. 101 D. None of the above
87.	The practice of mixing different classes of dietary proteins so that the deficits in one are balanced by the surplus in the other is known as: A. Protein quality B. Protein digestibility C. Protein complementation D. Nitrogen balance
88.	A 3000 mg sodium diet has approximately how many mEq of sodium? A. 69 B. 77 C. 117 D. 130
89.	Lingual lipase is secreted by the: A. Tongue B. Stomach C. Pancreas D. Mucosal brush border membrane
90.	In which of the following reactions does riboflavin participate (as FAD)? A. Aerobic oxidation of glucose via glycolysis B. Conversion of succinate to fumarate in the TCA cycle C. Conversion of acetyl CoA to malonyl CoA in fatty acid synthesis D. All of the above
91.	In IgE-mediated allergic reactions to foods, binding of the allergen to mast cells triggers the release of: A. Histidine B. Histamine C. Both A&B None of the above
92.	Which statement best describes' nutrient density' of your diet? A. Choose a number of different foods within any given food group rather than the same old thing. B. Consume a variety of foods from the five major food groups every day. C. Plan your entire day's diet so that you juggle nutrient sources. D. Consume foods that have the most nutrients for their calories.
93.	Which one of the following statements is incorrect? A. Rickets is the major symptom of Vitamin D deficiency

	B. Goitre is the major symptom of iodine deficiency C. Beriberi is the major symptom of Vitamin B2 deficiency D. Scurvy is the major symptom of Vitamin C deficiency
94.	Over the course of 24 h, 'diet-induced thermogenesis' accounts for roughly what percentage of an individual's total energy expenditure? A. 10% B. 20% C. 30% D. 40%
95.	The most biologically active form of Vitamin E is A. All-rac α-tocopherol B. RRR-α-tocopherol C. all-rac α-tocotrienol D. RRR-γ-tocopherol
96.	Which of the following has reducing properties? … A. Glucuronic acid B. Gluconic acid C. Glucaric acid D. Mucic acid
97.	Which of these is apolysaccharide from an animal source? A. Starch B. Inulin C. Cellulose D. Chitin
98.	Which of the following is/are unsaturated fatty acids? A. Linoleic acid B. Oleic acid C. Palmitoleic acid D. All of these
99.	When Benedict's solution and simple-carbohydrates are heated, the solution changes to orange red/ brick red. This reaction is caused by the ----------property of simple-carbohydrates. A. Oxidising B. Reducing C. Acidic D. Alkaline
100.	Vinegar is a dilute solution of: A. Formic acid B. Butanoic acid C. Acetic acid D. Propanoic acid
101.	A phosphoprotein present in egg yolk is A. Ovalbumin B. Ovoglobulin C. Ovovitellin D. Avidin

102.	Competitive inhibition of enzymes can be relieved by increasing the A. Enzyme concentration B. Substrate concentration C. Inhibitor concentration D. None of the above
103.	The antinutritional factor in legumes that interferes with the digestion of protein is A. Cyanogenic glycosides B. Goitrogens C. Protease inhibitors D. Saponins
104.	The enzyme used in measuring the freshness of fish is A. Lipase B. Xanthine oxidase C. Transglutaminase D. none of the above
105.	A plant polyphenol from the flavonoid group is A. Anthocyanin B. Carotene C. Xanthophyll D. Quercetin
106.	Which of the following sugars cannot participate in a Maillard reaction? A. Levulose B. Maltose C. Lactose D. Trehalose
107.	Which of these Phospholipids can act as a surfactant? A. Cephalin B. Phosphatidyl inositol C. Lecithin D. Phosphatidyl serine
108.	Among the following absorption maxima which is not in the visible range of the electronic spectrum? A. λmax = 250 nm B. λmax = 750 nm C. λmax = 550 nm D. λmax = 480 nm
109.	The yellow color of Saffron is due to the presence of A. Saffranal B. Crocin C. Beta carotene None of the above
110.	The neurotoxin present in Khesari dhal is A. A fatty acid B. An amino acid C. An alkaloid D. An isoflavone

111.	Which of the following isotopes is not a radioisotope? A. Carbon-13 B. Carbon-14 C. Tritium D. Sulphur-35
112.	The reading of a coloured solution in a spectrophotometer set at 340 nm showed an absorbance of 0.452. What is the unit of absorbance? A. L mol-1 cm-1 B. L gm-1 cm-1 C. Cm D. Absorbance has no unit
113.	Nucleic acids can be quantified experimentally by their: A. molecular weight B. absorption of visible light C. absorption of UV light D. none of these
114.	The three major colour groups from Mother Nature are: A. chlorophylls, carotenoids, and anthocyanins B. chlorophylls, carotenes and xanthophyll C. chlorophyll a, chlorophyll b and carotenoids D. beta-carotene, chlorophyll and alizarins
115.	A drop of food coloring spreading out in a cup of water is an example of which transport process? A. Osmosis B. Vapor pressure C. Diffusion D. Evaporation
116.	The ultraviolet absorption of proteins above 260 nm is due to the presence of A. Aromatic amino acids B. Acidic amino acids C. Branched chain amino acids D. Sulphur containing amino acids
117.	The rate of an enzyme catalyzed reaction was measured using several substrate concentrations that were much lower than the Km, the dependence of reaction velocity on substrate concentration can best be described as A. Independent of enzyme concentration B. A constant fraction of Vmax C. Equal to Km D. Directly proportional to the substrate concentration
118.	Ten grams of a seed powder was extracted into 25 mL of 0.2 M phosphate buffer. The extract (0.3 mL) was diluted with 0.9 mL of buffer. The absorbance of 1 mL of the extract in a 1 cm cuvette was 0.53 at 280 nm. The average $E_{cm}^{1\%}$ at 280 nm (absorbance of a 1% w/v solution) for proteins is 1550. Calculate the protein content (per 100 g) of the seed powder?

	A. 0.53 mg/100g B. 5.3 mg/100g C. 102.6 mg/100g D. 10.6 mg/100g
119.	An increase Tm (melting temperature) for a ds-DNA may be due to high content of A. A+G B. A+T C. C+G D. None of the above
120.	Two small molecules used as building blocks in living things are glucose (a monosaccharide) and glycine (the simplest amino acid). The functional groups that associated with these molecules are ... A. Amino and carboxyl only. B. hydroxyl, ether and ester. C. hydroxyl, amino and carboxyl. D. hydroxyl, ether and carboxyl
121.	Which of the following shows the correct flow of information in a cell? A. DNA, mRNA, protein, B. mRNA, DNA, protein C. protein, mRNA, DNA D. None of the above
122.	The vitamin niacin is part of:. A. ferredoxin B. pyridoxal phosphate C. pyrophosphate D. NAD+
123.	A triglyceride contains lauric acid (12:0), linoleic acid (18:2), and palmitoleic acid (16:1). How many moles of H_2 are required to completely hydrogenate this triglyceride? A. One B. Two C. Three D. Four
124.	Sanguinarine and dihydrosanguinarine are toxic alkaloids endogenous to A. Mustard B. Rapeseed C. Argemone D. Canola
125.	Linolenic acid (C17H29COOH) is a fatty acid found in vegetable oil. Stearic acid (C17H35COOH) is a fatty acid found in solid fats. It would be expected that the melting point of stearic acid would be higher than that of linolenic acid because ... A. the strength of C-C bonds in the stearic acid hydrocarbon chain is greater than those in the linolenic acid chain. B. the greater the number of hydrogen atoms in stearic acid leads

	to stronger hydrogen bonds between acid molecules. C. stearic acid has a saturated hydrocarbon chain while the linolenic acid chain is unsaturated. D. stearic acid has an unsaturated hydrocarbon chain while the linolenic acid chain is saturated
126.	Which of these groups are best associated with Food Hygiene Hazard? A. Animal hair, Pesticides, Mycotoxins B. Antibiotics, Heavy metals, Pesticides C. Microorganisms, sanitizer chemicals and Animal excreta D. All of the above
127.	How long should you lather and scrub, and rinse your hands as a GHP. A. Lather and scrub for 20 seconds, Rinse for 10 seconds. B. Lather and scrub for 10 seconds, Rinse for 20 seconds. C. Rinse for 10 seconds, Lather and scrub for 20 sec. D. Rinse for 20 seconds, Lather and scrub for 15 seconds.
128.	Which of these steps is not a critical control point? A. Dicing raw ingredient for the preparation of soup mix. B. Reviewing the source of raw ingredients for a food product. C. Cooking a raw food product to the critical limit. D. Serving the finished, ready-to-eat product
129.	Which of these statements best describes a HACCP system? A. Identifying physical, chemical and biological Hazards B. A systematic analysis of all steps and regular monitoring of the critical control points. C. Identifying the CCP's, including their location, procedure and process D. Accurately monitoring food hygiene hazards
130.	Integrity testing of high-efficiency particulate air (HEPA) filters is carried out using A. Dioctyl phthalate aerosols B. Formaldehyde vapors C. Sodium hypochlorite D. All of the above
131.	Environment monitoring for aerobic plate counts (APC), total plate counts (TPC), coliforms, Enterobacteriaceae, yeast and mold, etc., is A. an indicator of manufacturing unit hygiene B. assists with monitoring the effectiveness of the sanitation procedures C. an indicator level of contamination during processing. D. All of the above
132.	How can a hazard be controlled by an operational prerequisite program? A. By establishing a system wide safety and sanitation program B. By using a hazard based third party inspection program C. By establishing a purchase specification that addresses the hazard D. Requesting the regulatory authority to evaluate the wholesaler

133.	A food-borne illness that can be caused by a food service worker coughing or sneezing on food is due to: *A. Staphylococcus aureus* *B. Clostridium perfringens* *C. Salmonella* *D. Shigella*
134.	Validation, is confirming that the process and Critical Control Point (CCPs) are under control. An example of validating a pre-requisite program is A. Reviewing Food Defense procedures for a food plant. B. Swab testing of equipment after cleaning and sanitation procedures have been finished C. Microbiological testing for pathogens in a finished food product D. Taste testing a finished food product for consumer preferences
135.	What is the best system for stock rotation in a food manufacturing unit? A. First in, last out B. First in, first out C. First in used last D. Last in, first out.
136.	An organization in the food chain to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption will be certified as per A. ISO 9001 B. ISO 22000 C. ISO 14000 D. ISO 17025
137.	Which of the following statements is correct? A. Hand sanitizers can be used in place of handwashing. B. Disposable gloves can be used in place of handwashing. C. Food handlers must wait for hand sanitizer to dry before touching food. D. Food handlers can reuse gloves if they wash their hands between tasks
138.	The MOST important step during a 'Food recall' requires that a food establishment A. tracing product distribution B. remove the food in question from commerce C. sample the product for hazard D. know the product specifications
139.	The Total Plate Count cannot be used to predict the safety of a product but highlights potential hygiene problems associated with A. Storage B. Handling C. Processing D. All of the above

140.	The family *Enterobacteriaceae* are useful indicator organisms to monitor food A. Hygiene B. Contamination C. A & B D. Neither A nor B
141.	The major component of a bacterial cell wall is a polymer called: A. Xylan B. Chitin C. Cellulose D. Peptidoglycan
142.	The time required to kill microorganisms at a given lethal temperature is known as A. Z value B. D value C. C value None of the above
143.	Quorum sensing is used by bacterial cells to determine which of the following? A. the size of the population B. the availability of nutrients C. the speed of water flow D. the density of the population
144.	The causative agent of ergotism in grains is A. *Claviceps purpurea* B. *Penicillium*sp C. *Aspergillus*sps D. None of the above
145.	Phase-contrast microscopy enables the human eye to observe structures not visible by bright field-microscopy by modifying the light: A. path by 90°. B. contrast. C. intensity. D. wavelength.
146.	The food-poisoning toxins produced by *Staphylococcus aureus* are: A. exotoxins. B. lethal poisons. C. endotoxins. D. heat labile
147.	The test for indole production requires a culture to be inoculated into a medium rich in: A. Lysine B. Tryptophan C. Phenylalanine. D. Pyruvate
148.	Which of the following methods is best to sterilize heat labile solutions? A. Dry heat B. Autoclave

	C. Membrane filtration D. Pasteurization
149.	Mycotoxins are produced by *Aspergillus flavus* following the end of the A. Lag phase B. Log phase C. Death phase D. Stationary phase
150.	The milk *Streptococci* produce acetoin, which is spontaneously oxidized to a flavouring agent (responsible for aroma of butter) that is A. acetone B. acetyl CoA C. butyric acid D. diacetyl
151.	In a two-class sampling plan of microbiological analysis if it is desired to allow up to 100 coliforms/g in two of the five units, the sampling plan is: A. $n = 5, c = 1, m = 10^2$ B. $n = 5, c = 2, m = 10^2$. C. $n = 2, c = 5, m = 10^2$ D. None of the above
152.	Which of the following acid will have higher bacteriostatic effect at a given pH? A. Acetic acid B. Tartaric acid C. Citric acid D. Maleic acid
153.	Temperature affects water activity due to changes in A. Dissociation of water, B. Solubility of solutes in water C. State of the matrix D. All of the above
154.	A dense growth at the surface and turbidity throughout the rest of inoculated thioglycolate medium culture tube indicates A. The organisms die in the presence of oxygen B. The organisms are facultative anaerobes. C. The organisms should be grown in an anaerobic chamber. D. The organisms are obligate aerobes
155.	To determine the number of bacteria, present in a food sample,2.0 g of ground food is suspended in sterile diluent so that the final volume is 10.0 ml. From this initial dilution, two successive 1:100 dilutions are made. Then, 1.0 ml of the final dilution is pipetted into a sterile petri dish to which is added 20.0 ml of sterile nutrient agar. The plate count after incubation is 54 colonies. The number of bacteria(cfu) in 1.0 g of food is: A. 5.4×10^6. B. 2.7×10^4. C. 2.7×10^5. D. 5.4×10^5

156.	The time temperature combination for HTST pasteurization of milk, 71.1°C for 15 sec, is selected on the basis of which organism? A. *Coxiella burnetii* B. *E. coli* C. *B. subtilis* D. *C.botulinum*
157.	What is the cross-streak method used to test for? A. If the growth media is appropriate for certain bacteria B. The presence of harmful bacteria in an environmental sample C. The usefulness of a bacteria in the industrial process D. To look for inhibition of bacterial growth, indicating the possible presence of an antibiotic
158.	Which step is the MOST common source of error during the Gram stain procedure? A. Applying hematoxylin longer than 1 minute B. Over-decolorizing with alcohol C. Using heat-fixed specimen slides D. Applying safranin after decolorizing with alcohol
159.	If a canning procedure is not properly followed, which type of microbe is most likely to grow in the canned food? A. Obligate Aerobe B. Acidophile C. Mesophile D. Obligate Anaerobe
160.	Given a stock glucose solution with a concentration of 3 mg/ml, determine the glucose concentration of a solution made by adding 50 µl (microlitre) of the stock with 50 mL of a buffer. A. 2.97 mg/ml B. 2.97 µg/ml C. 2.97 mg/L D. Both B& C
161.	A 24-hour culture *of Bacillus subtilis* contains 2.4×10^6 CFU/ml. Sequential dilutions of 1:10, 1:5, 1:100, and 1:3 are made from the original samples. The final titre is: A. 4.8×10^3 CFU/ml. B. 1.6×10^3 CFU/ml. C. 8.0×10^2 CFU/ml. D. 1.6×10^2 CFU/ml.
162.	In Atomic Absorption Spectroscopy, which of the following is the generally used as a radiation source? A. Tungsten lamp B. Xenon mercury arc lamp C. Hydrogen or deuterium discharge lamp D. Hollow cathode lamp
163.	In a chromatogram, the area under the peak can be used to determine which of the following? A. Analytes in the sample B. Quantity of analyte in the sample

	C. Column efficiency D. Column resolution
164.	A Karl Fischer titration is used to determine: A. the alcohol content of blood. B. the pH of a water sample. C. the concentration of Cl_2 in a water sample. D. the moisture content of a sample
165.	Adulteration of milk with water can be detected by measuring A. Total Fat content B. Depression in the freezing point C. Solids Not Fat content D. Fatty acid composition
166.	One picogram is equal to: A. 1×10^{9} g B. 1×10^{-9} g C. 1×10^{12} g 1×10^{-12} g
167.	The dimension for S/N ratio in HPLC analysis is expressed as A. ppb B. cm -1 C. sq cm D. has no units
168.	A solution of 1% hexaconazole is equivalent to how many ppm? A. 1 ppm B. 1000 ppm C. 100 ppm D. 10000 ppm
169.	Which of the following statements is correct? A. Strength of 1 Normal solution of Sodium hydroxide is equivalent to 1 Molar solution of Sodium hydroxide B. Strength of 1 Normal solution of Sodium hydroxide is less than 1 Molar solution of Sodium hydroxide C. Strength of 1 Normal solution of Sodium hydroxide is more than 1 Molar solution of Sodium hydroxide D. Strength of 1 Normal solution of Sodium hydroxide is twice the 1 Molar solution of Sodium hydroxide
170.	Accuracy in an analytical measurement. It is defined as A. A measure of how often an experimental value can be repeated B. The number of significant figures used in a measurement. C. The closeness of a measured value to the real value. D. None of these
171.	In a mixture of the five molecules listed below, which should elute second in size-exclusion (gel permeation) chromatography? Mr = 13,000 Mr = 145,000 Mr = 13,700 Mr = 450,000. Mr = 68,500. A. Mr = 13,700 B. Mr = 145,000

	C. Mr = 68, 500 D. Mr = 450,000
172.	Tandem mass spectroscopy combines which of the following devices? A. Mass spectrometer and gas-solid chromatograph B. Mass spectrometer and gas-liquid chromatograph C. Mass spectrometer and gas chromatograph D. Mass spectrometer and mass spectrometer
173.	The following results were obtained in a minimum level of detection study: [0.523, 0.562, 0.601, 0.498, 0.547, 0.525, 0.578, 0.503] Calculate the mean? A. 0.542 B. 0.052 C. 0.5421 D. 0.0542
174.	Headspace analysis is carried out in order to A. determine the space in the head B. analyze the column contents ahead of the sample C. analyze volatile compounds from solid or liquid food samples D. determine non-volatile compounds
175.	The pH of pure water is neutral because A. The water has dissolved carbon di oxide B. The concentration of H^+ ions is equal to the concentration of OH^- ions C. Water does not contain H^+ and OH^- ions D. None of the above
176.	Calculate the molality by dissolving the 12 g of the NaCl in the 38 g of water. A. 3.16 m B. 5.40 m C. 6.22 m D. 2.41 m
177.	Which reagent would you use to distinguish between glucose and maltose? A. Benedict's reagent B. Barfoed's reagent C. Fehling's reagent D. Selawinoff's reagent
178.	If a compound has a pH of 6.5, it has a pOH of: A. 6.5 B. 7.5 C. 3.16×10^{-7} D. 3.16×10^{-8}
179.	Which of the following would not be a mobile phase for reversed phase liquid chromatography? A. Water

	B. Acetonitrile C. Methanol D. Hexane
180.	Compositional (Constitutional) heterogeneity of a food sample can be reduced by A. Mixing B. Blending C. Comminution D. None of the above
181.	Which statement with respect to cells (Cuvette)s used in UV-Vis Spectroscopy is incorrect A. The three standard cells for UV/VIS are, quartz, glass and plastic B. All three are suitable for the visible region and into the UV down to 350 nm C. Plastic cells are compatible with organic solvents. D. Below 350 nm, quartz is the only choice
182.	In a solid sample treatment technique for IR analysis, the finely ground solid sample is mixed with mineral oil to make a thick paste which is then spread between IR transmitting windows. What is the name of this solid sample treatment technique? A. Pressed pellet B. Mull technique C. Solid films D. Solids Run
183.	Which of these statements regarding mass and weight is not correct? A. The mass of a body is a measure of how much matter it contains. B. The weight of a body is a measure of the force exerted on it by gravity. C. There is no difference between weight and mass. D. The SI unit of mass is the kilogram (kg)
184.	A new drink contains sugar, salt, alcohol and vitamin C. Gas chromatography could be used to determine the ... A. concentration of all ingredients in the drink. B. alcohol, sugar and vitamin C content only. C. alcohol content only. D. alcohol and sugar content only.
185.	For a normal distribution, two standard deviations on each side of the mean would include what percentage of the total population? A. 47% B. 68% C. 95% D. 99%
186.	The wavelength accuracy calibration of a UV-Vis Spectrophotometer is carried out using A. Traceable Potassium di chromate solution B. Holmium oxide quartz and Didymium Glass filters

	C. Both A&B D. Neither A nor B
187.	A pipette is used to transfer a base into a flask sitting under a burette filled with acid. The pipette, the flask and the burette shouldbe rinsed with ------ respectively A. distilled water in all cases. B. base, distilled water and base. C. distilled water, base and acid. D. base, distilled water and acid
188.	The Iodine value by Wij's method for Safflower seed oil will be much ---------- than Safflower seed oil (High Oleic Acid) A. Higher B. Lower C. Identical D. Test cannot be used
189.	In 500 × g, what does this represent in accordance to centrifugation? A. Gravitational force B. Centrifugal force is 500 times greater than earthly gravitational force C. Centrifugal force is 500 times less than earthly gravitational force D. It is the same as the speed of the rotor in rpm
190.	The reaction between hydrochloric acid and sodium carbonate is represented by the equation $2HCl(aq) + Na2CO3(aq) \rightarrow 2NaCl(aq) + H2O(l) + CO2(g)$ If 25.0 mL of 0.050 M sodium carbonate solution is neutralised by 50.0 mL of hydrochloric acid, the concentration of the hydrochloric acid must be ... A. 0.010 M. B. 0.025 M. C. 0.10 M. D. 0.050 M.
191.	When we compare a C18 column against a C8 column: A. They are of same polarity B. C8 is more polar than C18 C. C18 is more polar than C8 D. Both represent HPLC mobile phases
192.	A pH of 3 is ---------- more acidic than pH 5 A. 2 times B. 100 times C. 1000 times D. 20 times
193.	Choose the correct statement with regard to quantitative Real Time PCR? A. End-point PCR is favourable over real-time PCR B. In real time PCR, DNA quantification is done as the amplification reaction is in progress C. The product measurement is done after the completion of all cycles

	D. If the primers are available in limited amount, then the product obtained is proportional to the target sequence
194.	Potassium permanganate cannot be used as a primary standard because ... A. it is not highly soluble in water. B. it has a low molar mass. C. it only reacts in an acidic solution. D. its solutions are unstable.
195.	Which of these statements is true of Flame photometry? A. It is very useful to detect the alkali and alkaline earth metals from the colour of the flame. B. Used in analysis for the determination of Na, K, Ca & Fe in biological samples. C. It is used to estimate alkali & alkaline earth metals in their metal salt solutions. D. All of the above
196.	What is the lighting level suitable for most of the laboratory work area? A. 0-500 Lux B. 500 to 1000 Lux C. 1000-2000 lux None of the above
197.	Aqueous-based sodium hydroxide solutions need to be standardised regularly because A. Sodium hydroxide reacts violently with water. B. Nitrogen dissolves from air, increasing its concentration. C. The sodium hydroxide evaporates slowly if containers are continually left open. D. Carbon dioxide in the air reacts with the sodium hydroxide, lowering its concentration
198.	During a gravimetric analysis experiment to determine the salt (NaCl) content of a chicken soup sample, a precipitate of silver chloride is produced, dried and weighed. Which of these errors could account for a lower-than-expected NaCl content? The sources of error in the analysis include I. The precipitate was not washed before it was dried. II. The soup contained some sodium iodide in addition to the sodium chloride. III. Some precipitate remained in the reaction flask after the filtration process. A. II and III only. B. I and II only C. III only D. II only
199.	The Molar extinction coefficient (ε) of Aflatoxin B1 is 22,300 in Chloroform at 352 nm. The molecular mass of Aflatoxin is 312 amu. The A_{352} of 5 ml unknown solution in chloroform was 0.011. What is the concentration of Aflatoxin B1 in the unknown?

	A. 0.049 micromoles L^{-1} B. 0.49 micromole L^{-1} C. 0.223 moles L^{-1} D. none of the above
200.	Tomatoes contain lycopene (λ max = 444, 470 and 502 nm) and β-carotene (λ max = 442 and 472 nm). Which technique could be used for the analysis of lycopene and β-carotene in tomatoes, after suitable sample preparation? A. HPLC with UV-VIS detection. B. HPLC with UV detection. C. ICP-OES D. LC-ICP-MS