

U.G./P.G. ENTRANCE EXAMINATION, APRIL 2021

FOOD SCIENCE AND TECHNOLOGY

Time : Two Hours

Maximum : 100 Marks

*Answer all questions.**Each question carries 1 mark.*

1. Which of the following should be constant for a body to have a constant momentum ?
 - (A) Acceleration.
 - (B) Force.
 - (C) Velocity.
 - (D) All of the above.
2. SI unit of the power of a lens is :
 - (A) Diopter.
 - (B) Horse power.
 - (C) Hertz.
 - (D) Watt.
3. The magnitude of the induced e.m.f. in a coil is directly proportional to the rate of change of flux linkages. This is known as :
 - (A) Joule's Law.
 - (B) Faraday's second law of electromagnetic induction.
 - (C) Faraday's first law of electromagnetic induction.
 - (D) Coulomb's Law.
4. The point in a magnet where the intensity of magnetic lines of force is maximum :
 - (A) Magnetic pole.
 - (B) South pole.
 - (C) North pole.
 - (D) Unit pole.
5. The term "thermodynamics" comes from the Greek words 'therme' and 'dynamic which means :
 - (A) Heat power.
 - (B) Heat transfer.
 - (C) Heat energy.
 - (D) Heat motion.
6. The electrons in an atom which rotate about the nucleus possess what kind of energy ?
 - (A) Translational energy.
 - (B) Spin energy.
 - (C) Sensible energy.
 - (D) Rotational kinetic energy.

Turn over

7. What is the value of coherent time if L is the coherent length and c is the velocity of light ?
- (A) cL . (B) L/c .
(C) c/L . (D) $1/Lc$.
8. In Young's double-slit experiment, the phase difference between the light waves reaching the third bright fringe from the central fringe will be ($\lambda = 6000 \text{ \AA}$) :
- (A) Zero. (B) 2π .
(C) 4π . (D) 6π .
9. Gamma rays are :
- (A) Electromagnetic waves. (B) Helium nucleus
(C) Fast moving electron. (D) Single ionized gas atom.
10. The fuel used in nuclear power plants is :
- (A) U-235. (B) U-236.
(C) U-238. (D) U-239.
11. Which of the following has a positive charge ?
- (A) Proton. (B) Neutron.
(C) Anion. (D) Electron
12. Which is the Correct Geometry and Hybridisation of XeF_4 ?
- (A) Octahedral, sp^3d^2 . (B) Square planar, sp^3d^2 .
(C) Trigonal bipyramidal, sp^3d^2 . (D) Planar triangle, sp^3d^3 .
13. Which of the following acid reduces Fehling solution ?
- (A) Methanoic acid. (B) Ethanoic acid.
(C) Butanoic acid. (D) Propanoic acid.
14. Choose the process by which liquid hydrocarbons can be converted to gaseous hydrocarbons :
- (A) Hydrolysis. (B) Oxidation.
(C) Cracking. (D) Distillation under reduced pressure.

15. An increase in the conductivity equivalent of a solid electrolyte with dilution is primarily due to :
- (A) Increased ionic mobility of ions.
 - (B) 100 percent electrolyte ionisation with natural dilution.
 - (C) Increase in both ion numbers and ionic mobility.
 - (D) A rise in ion counts.
16. As the temperature of a reaction is increased, the rate of the reaction increases because the :
- (A) Reactant molecules collide less frequently.
 - (B) Reactant molecules collide more frequently and with greater energy per collision.
 - (C) Activation energy is lowered.
 - (D) Reactant molecules collide less frequently and with greater energy per collision.
17. During oxidation process electrons are :
- (A) Lost.
 - (B) Gained.
 - (C) Paired up.
 - (D) Remains same.
18. According to the Boyle's law the volume of a fixed mass of a gas, at constant temperature, is :
- (A) Directly proportional to its pressure.
 - (B) Inversely proportional to its pressure.
 - (C) The square root of its pressure.
 - (D) None of these.
19. Which of the following separation techniques is dependent on difference in volatility ?
- (A) Distillation.
 - (B) Crystallization.
 - (C) Magnetic separation.
 - (D) Fractional crystallization.
20. In which type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure ?
- (A) Column chromatography.
 - (B) Planar chromatography.
 - (C) Liquid chromatography.
 - (D) Gas chromatography.

Turn over

21. Hemoglobin in humans has the highest affinity for which of the following gases ?
- (A) Methane. (B) Carbon monoxide.
(C) Nitrous oxide. (D) Carbon dioxide.
22. Nephron is the basic structural and functional unit of which among the following organs ?
- (A) Nervous system. (B) Liver.
(C) Pancreas. (D) Kidney.
23. Which among the following sugars is maximum in Honey ?
- (A) Glucose. (B) Sucrose.
(C) Fructose. (D) Maltose.
24. The human heart is :
- (A) Neurogenic heart. (B) Myogenic heart.
(C) Pulsating heart. (D) Ampullary heart.
25. Who is known as father of Zoology ?
- (A) Darwin. (B) Aristotle.
(C) Lamark. (D) Theophrastus.
26. Which organism among the following exists without red blood cells ?
- (A) Frog. (B) Earthworm.
(C) Snake. (D) Peacock.
27. The common pesticides which are in use consist of :
- (A) PCBs. (B) Organochlorines.
(C) Olefins. (D) Hetrocyclic compounds.
28. The increased use of groundwater for irrigation purposes has led to :
- (A) Stalination. (B) Lowering of the water table.
(C) Water logging. (D) All the above.
29. Plants synthesis protein from :
- (A) Starch. (B) Sugar.
(C) Amino acids. (D) Fatty acids.

30. Most of the red, blue and purple colors of plants are due to a pigment called :
- (A) Anthocyanin. (B) Carotene.
(C) Chlorophyll. (D) Xanthophyll.
31. Structure of DNA and protein found in the nucleus of eukaryotic cells :
- (A) Nucleic acid. (B) Nucleosome.
(C) Chromatin. (D) Tetraplex.
32. Which of the following is less condensed, less stained portion of chromatin ?
- (A) Metaphase. (B) Interphase.
(C) Heterochromatin. (D) Euchromatin.
33. The principle light-trapping pigment molecule in plants, Algae, and cyanobacteria is :
- (A) Chlorophyll a. (B) Chlorophyll b.
(C) Porphyrin. (D) Rhodopsin.
34. Enzymes responsible for alcoholic fermentation :
- (A) Ketolase. (B) Zymase.
(C) Peroxidase. (D) Oxidase.
35. The functions of plasmid are :
- (A) DNA replication. (B) Protein synthesis.
(C) Cell wall synthesis. (D) None of the above.
36. Role of bacteria in carbon cycle is :
- (A) Photosynthesis. (B) Chemosynthesis.
(C) Breakdown of organic compounds. (D) Assimilation of nitrogen compounds.
37. Example of Anaerobic medium is :
- (A) Robertson cooked-meat medium. (B) Nutrient agar.
(C) Nutrient broth. (D) Mac-Conkey's agar.
38. For sterilization of fermentation equipment the method followed is :
- (A) Radiation. (B) Chemicals.
(C) Heating. (D) All of these.

Turn over

39. Ergot disease is caused by :
- (A) Puccinia. (B) Rhizopus.
(C) Claveceps. (D) Penicillium.
40. Virulent factor in pneumococcus is :
- (A) Cell wall. (B) Capsule.
(C) Mesosomes. (D) Endotoxins.
41. Which of these bacterial components is least likely to contain useful antigens ?
- (A) Cell wall. (B) Flagella.
(C) Ribosomes. (D) Capsule.
42. Which of the following contains structures composed of N-acetylmuramic acid and N-acetylglucosamine ?
- (A) Mycoplasmas. (B) Amoeba.
(C) E.coli. (D) Spheroplast.
43. The association of endotoxin in gram-negative bacteria is due to the presence of :
- (A) Steroids. (B) Peptidoglycan.
(C) Lipopolysaccharides. (D) Polypeptide.
44. The prokaryotic cell membrane :
- (A) Contains metabolic enzymes.
(B) Is selectively permeable.
(C) Regulates the entry and exit of materials.
(D) Contains proteins and phospholipids.
45. Which of the statements regarding gram staining is wrong ?
- (A) *Mycobacterium tuberculosis* stains blue because of the thick lipid layer.
(B) *Streptococcus pyogenes* stains blue because of a thick peptidoglycan layer.
(C) *Escherichia coli* stains pink because of a thin peptidoglycan layer.
(D) *Mycoplasma pneumoniae* is not visible in the Gram's stain because it has no cell wall.

46. Which of the following is not a recognised cause of diarrhoea ?
- (A) *Vibrio cholera.* (B) *Escherichia coli.*
(C) *Clostridium perfringens.* (D) *Enterococcus faecalis.*
47. Which of the following is a gram-positive eubacterium ?
- (A) Actinomyces. (B) Clostridium.
(C) Rhizobium. (D) Clostridium, Actinomyces.
48. Which of the following microorganisms is not responsible for urinary tract infection ?
- (A) Proteus mirabilis. (B) Escherichia coli.
(C) Klebsiella pneumonia. (D) Bacteroides fragilis.
49. Which of the following is diagnosed by serologic means ?
- (A) Actinomycosis. (B) Q-fever.
(C) Pulmonary tuberculosis. (D) Gonorrhoea.
50. Diarrhoea is not caused by :
- (A) *BShigella dysenteriae.* (B) *Streptococcus pyogenes.*
(C) *Clostridium difficile.* (D) *Salmonella enteritidis.*
51. HDL is synthesized and secreted from :
- (A) Pancreas. (C) Kidney.
(B) Liver. (D) Muscle.
52. The phenomenon of osmosis is opposite to that of :
- (A) Diffusion. (B) Effusion.
(C) Affusion. (D) Coagulation.
53. The sugar found in RNA is :
- (A) Ribose. (B) Deoxyribose.
(C) Ribulose. (D) Erythrose.
54. Mutarotation refers to change in :
- (A) pH. (B) Optical rotation.
(C) Conductance. (D) Chemical properties.

Turn over

55. Gluconeogenesis is decreased by :
- (A) Glucagon. (B) Epinephrine.
(C) Glucocorticoids. (D) Insulin.
56. Active uptake of glucose is inhibited by :
- (A) Ouabain. (B) Phlorrizin.
(C) Digoxin. (D) Alloxan.
57. Under anaerobic conditions the glycolysis of one mole of glucose yields _____ moles of ATP.
- (A) One. (B) Two.
(C) Eight. (D) Thirty.
58. Non essential amino acids :
- (A) Are not components of tissue proteins.
(B) May be synthesized in the body from essential amino acids.
(C) Have no role in the metabolism.
(D) May be synthesized in the body in diseased states.
59. An essential for converting Glucose to Glycogen in Liver is :
- (A) Lactic acid. (B) GTP.
(C) CTP. (D) UTP.
60. Phenylalanine is the precursor of :
- (A) L-DOPA. (B) Histamine.
(C) Tyrosine. (D) Throxine.
61. Each turn of α -helix contains the amino acid residues (number) :
- (A) 3.6. (B) 3.0.
(C) 4.2. (D) 4.5.
62. The apolipoprotein which acts as actiator of extrahepatic lipoprotein is :
- (A) Apo-A. (B) Apo-B.
(C) Apo-C. (D) Apo-D.

63. Serum LDL has been found to be increased in :
- (A) Obstructive jaundice. (B) Hepatic jaundice.
(C) Hemolytic jaundice. (D) Malabsorption syndrome.
64. A lipoprotein associated with high incidence of coronary atherosclerosis is :
- (A) LDL. (B) VLDL.
(C) IDL. (D) HDL.
65. The daily caloric requirement for the normal adult female is about :
- (A) 1500. (B) 2100.
(C) 2500. (D) 2900.
66. Net protein utilisation depends upon :
- (A) Protein efficiency ratio.
(B) Digestibility co-efficient.
(C) Digestibility co-efficient and protein efficiency ratio.
(D) Digestibility co-efficient and biological value.
67. SGOT level in a adult is :
- (A) 5-40 units/dl. (B) 1-4 units/dl.
(C) 5-15 units/dl. (D) 50-100 units/dl.
68. Gaucher's disease is due to deficiency of the enzyme :
- (A) Sphingomyelinase. (B) Glucocerebrosidase.
(C) Galactocerbrosidase. (D) β -Galactosidase.
69. The percentage of polyunsaturated fatty acids in butter is :
- (A) 60. (B) 37.
(C) 25. (D) 3.

Turn over

70. Dietary fibre denotes :
- (A) Undigested proteins.
 - (B) Plant cell components that cannot be digested by own enzymes.
 - (C) All plant cell wall components.
 - (D) All non-digestible water insoluble polysaccharide.
71. Sucrose is commonly referred to as :
- (A) Salt.
 - (B) Sugar.
 - (C) Carbohydrate.
 - (D) Glucose.
72. The most common polysaccharide added to food products :
- (A) Water.
 - (B) Glucose.
 - (C) Salt.
 - (D) Starch.
73. Identify the complex carbohydrate that cannot be digested :
- (A) Fiber.
 - (B) Sugar.
 - (C) Cellulose.
 - (D) Fat.
74. Which micro mineral is essential for the production of the thyroid hormones ?
- (A) Calcium.
 - (B) Fluorine.
 - (C) Iodine.
 - (D) Magnesium.
75. RDA stands for Recommended _____ Allowances.
- (A) Dose.
 - (B) Dairy.
 - (C) Dietary.
 - (D) Daily.
76. Naturally occurring _____ play a role in food coloring.
- (A) Enzymes.
 - (B) Pigments.
 - (C) Sugars.
 - (D) Carbohydrates.
77. Process achieved on the basis of density or size and shape :
- (A) Separation.
 - (B) Clarification.
 - (C) Quality.
 - (D) Flavor.

78. Sediment and microorganisms can be removed centrifugally in a _____.
- (A) Tube. (B) Pan.
(C) Clarifier. (D) Box.
79. Foods high in _____ dry more slowly.
- (A) Protein. (B) Sugar.
(C) Salt. (D) Water.
80. _____ is when water goes from a solid to a gas without passing through the liquid phase.
- (A) Transfusion. (B) Evaporation.
(C) Sublimation. (D) Condensation.
81. If A is a square matrix of 3×3 order, where $|A| = 3$, then find out the value of $|\text{adj } A|$.
- (A) 3. (B) 9.
(C) 30. (D) $1/3$.
82. If A and B are two events, where $P(A) = 0.2$, $P(B) = 0.4$ and $P(A \cup B) = 0.5$. Find the value of $P(A/B)$:
- (A) 0.25. (B) 0.08.
(C) 0.1. (D) 0.080.
83. An urn has 6 balls out of which 4 balls are black and 2 balls are red. Two balls are drawn at random. What is the probability that the ball drawn are of different colours ?
- (A) $1/15$. (B) $8/15$.
(C) $2/5$. (D) $4/15$.
84. Let R be a relation on the set L of lines defined by $l_1 R l_2$ if l_1 is perpendicular to l_2 , then relation R is :
- (A) Reflexive and symmetric.
(B) Symmetric and transitive.
(C) Equivalence relation.
(D) Symmetric.

Turn over

85. Given triangles with sides $T_1 : 3, 4, 5$; $T_2 : 5, 12, 13$; $T_3 : 6, 8, 10$; $T_4 : 4, 7, 9$ and a relation R in set of triangles defined as $R = \{(\Delta_1, \Delta_2) : \Delta_1 \text{ is similar to } \Delta_2\}$. Which triangles belong to the same equivalence class ?
- (A) T_1 and T_2 . (B) T_2 and T_3 .
 (C) T_1 and T_3 . (D) T_1 and T_4 .
86. Set A has 3 elements and the set B has 4 elements. Then the number of injective functions that can be defined from set A to set B is :
- (A) 144. (B) 12.
 (C) 24. (D) 64.
87. A function is said to be continuous for $x \in \mathbb{R}$, if :
- (A) It is continuous at $x = 0$. (B) Differentiable at $x = 0$.
 (C) Continuous at two points. (D) Differentiable for $x \in \mathbb{R}$.
88. If $f(x) = \log_x 2(\log x)$, then $f(e)$ is :
- (A) 0. (B) 1.
 (C) $1e$. (D) $12e$.
89. The derivative of $\sin x$ with respect to $\log x$ is :
- (A) $\cos x$. (B) $x \cos x$.
 (C) $\cos x \log x$. (D) $1/x \cos x$.
90. If a is such that $\int_0^1 a^x dx \leq a + 4$, then :
- (A) $0 \leq a \leq 4$. (B) $-2 \leq a \leq 0$.
 (C) $a \leq -2$ or $a \leq 4$. (D) $-2 \leq a \leq 4$.
91. The area of parallelogram whose adjacent sides are $i^{\wedge} - 2j^{\wedge} + 3k^{\wedge}$ and $2i^{\wedge} + j^{\wedge} - 4k^{\wedge}$ is :
- (A) $10\sqrt{6}$. (B) $5\sqrt{6}$.
 (C) $10\sqrt{3}$. (D) $5\sqrt{3}$.

92. Let $*$ be a binary operation on N defined by $a * b = a + b + ab^2$, then find $4*5$:
- (A) 9. (B) 88.
(C) 98. (D) 99.
93. Which of the following is not a type of binary operation ?
- (A) Transitive. (B) Commutative.
(C) Associative. (D) Distributive.
94. Which of the following conditions holds true for a system of equations to be consistent ?
- (A) It should have one or more solutions.
(B) It should have no solutions.
(C) It should have exactly one solution n .
(D) It should have exactly two solutions.
95. If the rate of change of radius of a circle is 6 cm/s then find the rate of change of area of the circle when $r = 2$ cm :
- (A) 74.36 cm²/s. (B) 75.36 cm²/s.
(C) 15.36 cm²/s. (D) 65.36 cm²/s.
96. Nature of the function $f(x) = e^{2x}$ is _____.
- (A) Increasing. (B) Decreasing.
(C) Constant. (D) Increasing and decreasing.
97. Which of the following functions is the solution of the differential equation $dydx + 2y = 0$?
- (A) $y = -2e^{-x}$. (B) $y = 2e^x$.
(C) $y = e^{-2x}$. (D) $y = e^{2x}$.
98. How many arbitrary constants will be there in the general solution of a second order differential equation ?
- (A) 3. (B) 4.
(C) 2. (D) 1.

Turn over.

99. Which of the following holds true for a vector quantity ?

- (A) It has only magnitude.
- (B) It has only direction.
- (C) A vector has both direction and magnitude.
- (D) A vector can never be negative.

100. Which of the given quantity is a vector ?

- (A) Speed.
- (B) Time.
- (C) Weight.
- (D) Volume.

(100 × 1 = 100 marks)

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