ENTRANCE EXAMINATION FOR ADMISSION, MAY 2010.

M.Sc. (FOOD SCIENCE AND TECHNOLOGY)

COURSE CODE : 396

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 396

Time : 2 Hours Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) or (E) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. The value of $\begin{vmatrix} a+b & a & b \\ a & a+c & c \\ b & c & b+c \end{vmatrix}$

(A) $a^3b^3c^3$ (B) $4a^2b^2c^2$ (C) $4abc$ (D) $\pi(a+b)$

2. If α, β are the roots of the equation $x^2 - 2x + 4 = 0$ the $\alpha^6 - \beta^6 =$

(A) 64 (B) 128 (C) $n-128$ (D) 0

3. Solution of $[D^2 + 2D + 1]y = e^{-x}$ is $y =$

(A) $(Ax + B)e^{-x}$ (B) $(Ax + B)e^{-x} + x^2/2$

(C) $(Ax + B)e^{-x} + x^2/2.e^{-x}$ (D) $(Ax + B)e^{-x} - x^2/2.e^{-x}$

4. The probability of a man hitting a target is 3/4. He tries 5 times. The probability that the target will be hit atleast 3 times is

(A) 291/364 (B) 471/502 (C) 371/464 (D) 459/512

5. The minimum value of $f(x) = x^2 - 1/x^2 + 1$ for real x is

(A) 1 (B) –1 (C) 0 (D) –2

6. $\int^{x/2} \sin x - \cos x / dx =$

(A) 0 (B) $2[\sqrt{2}+1]$ (C) $3\sqrt{2}$ (D) $2[\sqrt{2}-1]$

7. The coordinates of an equilaterial triangle are

(A) all integers (B) all rationals

(C) all integers or rationals (D) none

8. The locus of the vartices of the family of parabolas $y = a^2x^2/3 + a^2x/2 - 2a$ is

(A) $xy = 35/16$ (B) $xy = 64/105$

(C) $105/64 = xy$ (D) $Xy = 3/4$

9. The solution of the differential equation $(\cos^2 x)dx/dy + y = \tan x$ is

(A) $y = (1 + \tan x) + ce^{(1/\tan x)}$ (B) $y = (1 + \tan x) + ce^{(\tan x)}$

(C) $y = (-1 + \tan x) + ce^{-(1/\tan x)}$ (D) $y = (-1 + \tan x) + ce^{-(\tan x)}$

10. The angle between the line $x-1/-3=y-3/2=z-2/1$ and the plane $2x+2y+z=11$

(A) $\sin^{-1}(8/9)$ (B) $\cos^{-1}(4/21)$

(C) $\sin^{-1}(16/21)$ (D) $\cos^{-1}(5\sqrt{17}/21)$

11. Clostridium botulinum is a example for

(A) Thermophillic organism (B) Mesophillic organism

(C) Psychrophillic organism (D) Psychrotrophs

12. What is the antimicrobial constituent present in eggs?

(A) Allicin (B) Lysozyme

(C) Allyl isothiocynate (D) Eugenol

13. Agar is superior to gelatin as a solidifying agent because agar

(A) Does not melt at room temperature

(B) Solidifies 75°C

(C) Is not usually decomposed by microorganism

(D) Both (A) and (C)

14. Low acid foods having the pH of

(A) 6.5 – 5.8 (B) 5.2 – 5.8 (C) 4.5 – 5.5 (D) 3.0 – 4.5

15. Which is not the intrinsic parameters of food, which affect the microbial growth?

(A) pH (B) Moisture content

(C) Oxidation – reduction potential (Eh) (D) Temperature of storage

16. Among these which one is a bacterium?

(A) Alternaria (B) Monilla (C) Cryptococcus (D) Pediococcus

17. Among these which one is not a yeast

(A) Saccharomyces (B) Torulpora

(C) Pichia (D) Yersinia

18. Entrance of microorganisms into the body through the ingestion of contaminated foods is called

(A) Food infection (B) Food intoxication

(C) Food contamination (D) None of these

19. Z value is indicator in

(A) Minute (B) Number

(C) Log number (D) Degree centigrade

20. Softness of pickles is due to

(A) Penicillium (B) Bacillus

(C) Lactobacillus (D) Pseudomonas

21. The composition of capsule of bacteria is

(A) Fatty acid (B) Cellulose (C) Chitin (D) Pectin

22. Controlled growth of ———— is recommended for flavor development in meat.

(A) Penicillium (B) Sporotrichum

(C) Thamnidium (D) Cladosporium

23. The non motile fungal spores are known as

(A) Aplanospores (B) Planospores

(C) Zygospores (D) Hypnospores

24. Brewing is

(A) Cultivation of grape (B) Manufacture of beer

(C) Preservation of meat by fermentation (D) None of the above

25. The decolorizer used in case of gram staining is

(A) Water (B) Alcohol

(C) Benzene (D) Any of the above

26. Which staining technique is best suited to know the presence of micro bacterium species in culture?

(A) Positive staining (B) Negative staining

(C) Fluorescent staining (D) Acid fast staining

27. The average molecular weight of air is

(A) 23 (B) 26 (C) 29 (D) 32

28. An insulator should have

(A) high thermal conductivity (B) low thermal conductivity

(C) less resistance to heat transfer (D) none of the above

29. 1 torr is equivalent to

(A) 1 mm Hg (B) 6 mm Hg (C) 8 mm Hg (D) 4 mm Hg

30. Grashhoff number is

(A) $\beta g \Delta t l^3 \rho^2 / \mu^2$ (B) $\mu^2 / \beta g \Delta t l^2 \rho^3$

(C) $\beta g \Delta t l^2 \rho^3 / \mu^2$ (D) $\mu^2 / \beta g \Delta t l^3 \rho^2$

31. Natural convectional heat transfer is characterized by

(A) Grashhoff number (B) Peclet number

(C) Reynolds number (D) Prandtl number

32. Respiratory Quotient RQ is a measure of

(A) Amount of CO_2 formed/gram of O_2 feed

(B) Amount of O_2 formed / gram of substrate feed

(C) Amount of CO_2 formed / gram of substrate feed

(D) None of the above

33. DO probe is an ———— electrode

(A) Potentiometric (B) Ampheometric

(C) Calorimetric (D) Colorimetric

34. Luedeking – Pircet equation is his study of

(A) Product formation kinetics (B) Substrate utilization

(C) Oxygen utilization kinetics (D) None of the above

35. For an ideal gas, the compressibility factor

(A) Decreases with pressure rise (B) Is unity a all temperature

(C) Zero (D) Is unity at Boyle's temperature

36. Microbial growth under idiophase is in ———— order

(A) 1 (B) 2 (C) 3 (D) 0

37. Unit of mass velocity is

(A) Kg/m hr (B) Kg/m^2 hr (C) Kg/hr (D) Kg/m^2

38. Which of the following is a renewable energy source?

(A) Bitumen (B) Solar energy (C) Coal (D) Natural gas

39. Greenhouse effect refers to increase in

(A) Global temperature (B) Carbon monoxide

(C) Atmospheric pressure (D) Greenery

40. X-ray is a form of

(A) Chemical energy (B) Radiant energy

(C) Thermal energy (D) Potential energy

41. Among the following, which is most important for carrying out a material balance

(A) Temperature of products (B) Mass

(C) Waste Quantity (D) Pressure

42. Enzyme may be called as

(A) Bio catalysts (B) Proteins

(C) Amino acids (D) None of the above

43. ———— is a disaccharide

(A) Lactose (B) Starch

(C) Trehelose (D) Cellulose

44. Amylopectin is

(A) Heteropolysaccharide

(B) Straight chain homo polysaccharide

(C) Branched chain polysaccharide

(D) Protein

45. The monomeric unit of lactose are

(A) Glucose and fructose (B) Glucose and glucose

(C) Galactose and galactose (D) Galactose and glucose

46. Which is not an Indicator Microorganism?

(A) Listeria monocytogenes (B) Mycobacterium tuberclosis

(C) Enterococcus faecalis (D) Staphylococcus areas

47. Example for food intoxication is

(A) Botulism (B) Yersiniosis (C) Shigellosis (D) Vibriosis

48. Food containing live microorganisms to actively enhance health by improving the balance of micro flora in the gut is called as

(A) Pre biotic (B) Probiotic

(C) Biotic (D) All the above

49. Which is not a probiotic organism?

(A) L. fermentum (B) B. lactis

(C) Streptococcus thermophilus (D) None of these

50. Which is not a fermented product from milk?

(A) Cheese (B) Yogurt (C) Kefir (D) Tempeh

51. Destruction of pathogenic organism is called as

(A) Pasteurization (B) Sterilization

(C) Destruction (D) None of these

52. Time temperature combination for HTST

(A) 72°C for 15 sec (B) 70°C for 15 sec

(C) 62°C for 15 sec (D) 75°C for 15 sec

53. Which has the optimum temperature range between 10 to 15°C for easy growth?

(A) Thermophillic organism (B) Mesophillic organism

(C) Psychrophillic organism (D) Psychrotrophs

54. By using hullers the average yield of white rice is obtained as

(A) 55–62% (B) 62–64% (C) 65–67% (D) 68–71%

55. pH of honey is

(A) 2.3 to 2.9 (B) 3.2 to 4.2 (C) 5.6 to 6.9 (D) 7.0 to 8.1

56. In jam and jellies, which of the following is most likely to be responsible for the spoilage?

(A) Bacteria only (B) Molds only

(C) Yeast and molds (D) Yeasts, molds and bacteria

57. Which model is used to explain the cell structure of bacteria?

(A) Fluid mosaic model (B) Pumkin model

(C) Pasteur model (D) None of the above

58. Preservation of foods in sealed containers and which usually implies heat treatments the principal factor in the prevention of spoilage is called

(A) Cold sterilization (B) Canning

(C) Aseptic packaging (D) Simmering

59. Alcohol content is beer is (by weight)

(A) 3–4% (B) 5–12% (C) 20–23% (D) 35–38%

60. Rum is

(A) Distilled liquor (B) Un Distilled liquor

(C) Fortified wine (D) By product of brewing industry

61. Fourier's law of heat conduction applies to

(A) Convection (B) Conduction (C) Radiation (D) All the above

62. Which of the following has the highest thermal conductivity?

(A) Brick (B) Sand (C) Copper (D) Wood

63. Dry air is a mixture

(A) Vapours (B) Gases

(C) Both (A) and (B) (D) Either (A) or (B)

64. Claussius Clapergron equation applies to ———— processes

(A) Sublimation (B) Melting

(C) Vaporization (D) All the above

65. In a continuous stirred tank Bio reactor all the cells will be completely washout when D is

(A) 1 (B) <1

(C) >1 (D) 0

66. The rate of cell death follows ———— kinetics

(A) Second order (B) Zero order

(C) First order (D) Both (B) and (C)

67. ———— chart is graph related to Antoine equation

(A) Ostwald (B) COX

(C) Mollier's (D) Enthalpy concentration

68. The dimension of dynamic viscosity is

(A) $ML^{-1}T^{-1}$ (B) L^2T^{-1} (C) LT^{-2} (D) $ML^{-1}T^{-2}$

69. Idli is a

(A) Natural food (B) Non vegetarian food

(C) Fermented food (D) Baked food

70. What may be a reason for the relative success of bacterial forms?

(A) Rapid multiplication in number (B) High surface area to volume

(C) Rapid metabolic rates (D) All of them

71. The quantity of heat required to raise 1 kg of a substance of 1°C is known as

(A) Sensible heat (B) Specific heat

(C) Latent heat (D) Calorie

72. In a sterilized soap bubble, pressure inside it compare to external pressure is

(A) More (B) Less

(C) Equal (D) Unpredictable

73. The unit of kinematic viscosity is

(A) kg/m sec (B) N/m^2

(C) m^2/sec (D) m/N sec

74. Wheat is ground into flour in a

(A) Roller crusher (B) Impact mill

(C) Hammer crusher (D) Fluid energy mill

75. One of the following is coenzyme

(A) ATP (B) Riboflavin

(C) $NADH_2$ (D) Iron

(E) All the above

76. Coenzymes are vitamins

(A) True (B) False

(C) True but not all vitamins (D) None of these

77. Ribose is a

(A) Ketopentose (B) Aldohexose

(C) Ketohexose (D) Aldoketose

78. Amylose is

(A) Heteropolysaccharide

(B) Straight chain homo polysaccharide

(C) Branched chain polysaccharide

(D) Protein

79. The carbohydrate moiety in bacterial cells

(A) Peptidoglycon (B) Glucose and glucose

(C) Galactose and galactose (D) Galactose and glucose

80. Milk sugar is ———— and cane sugar is ————

(A) Lactose and sucrose (B) Sucrose and lactose

(C) Glucose and sucrose (D) None of the above

81. Which of the following has maximum hydrogen bonding?

(A) glycerol (B) glycol

(C) acetic acid (D) both (B) and (C)

82. Nitromethane reacts with alkali due to

(A) its neutral nature (B) its acidic tautomeric form

(C) its basic nature (D) its ampheteric nature

83. The stabilizer mixed with ether is

(A) 20% of propyl bromide (B) 0.002% propyl halide

(C) 0.02% of allyl halide (D) chloroform

84. Elements with atoms in which two outermost shalls in compete are

(A) inert gas elements (B) representative elements

(C) d-block elements (D) f-block elements

85. Thermosetting plastics is/are

(A) phenol-formaldehyde (B) urea-formaldehyde

(C) malmine-formaldehyde (D) all of these

86. A spectrometer has 250 equal divisions marked along the circumference of its disc and the full relation of the disc advance the main scale by 0.0625 cm. The least constant of spherometer is

(A) 2.5×10^{-1} an (B) 2.5×10^{-4} an

(C) 4.0×10^{-4} an (D) 2.5×10^{-6} an

87. Electromagnetic waves are

(A) longitudinal waves (B) transverse waves

(C) spherical waves (D) cylindrical waves

88. The units of dimensions of which of the following pairs of physical quantities are identical?

(A) impulse and momentum (B) stress and strain

(C) pressure and density (D) gravitational potential and energy

89. A moving electron has numerical relation $\lambda = h$, then

(A) $me = 1/v_e$ (B) $v_e = 1/me$

(C) both (A) and (B) (D) none

90. The balancing length on the potentiometer due to two cells are 240 cm, and 720 cm of the potential of the 1st is 2 V, the potential of the second cell is

(A) 6 V (B) 18 V (C) 4 V (D) 72 V

91. The soft bread wheat triticum vulgare is an/a

(A) mutant (B) autoploid

(C) allohexaploid (D) hybrid

92. Pathological, biological agents or toxins used against humans and crops of enemy countries is called

(A) biopesticide (B) biowar

(C) bioethics (D) bioweapons

93. The endosperm of Gymnosperms are formed

(A) during fertilization

(B) before fertilization

(C) after fertilization

(D) along with the development of embryo

94. Some bacteria are not easily killed by antibiotic etc. due to

(A) capsule (B) chitinous cell wall

(C) endospore formation (D) resistance

95. Why do farmers water the plants after adding chemical fertilizers?

(A) to prevent exosmosis (B) to reduce concentration

(C) to promote growth (D) to reduce the temperature

96. The nerve life medified muscle in the right auricle is known as

(A) lymph node (B) atrio ventricularnode

(C) sino atrial node (D) bulbas asteriojus

97. Speticemia disease is caused by

(A) salmonella (B) adeno virus

(C) rhabdo virus (D) hepatitis virus

98. Which of the following functions is performed by natural killer cells?

(A) recognize cell surface changes on virally infected cells

(B) produce interferons

(C) secrete interleukins

(D) produce Ig G

99. Aminoacids were produced from H_2, HN_3CH_4 and water vapour in the laboratory by

(A) Urey (B) Stumpf and cohn

(C) Miller (D) Blackman

100. How many types of immunoglobulines are secreted by B-lymphocytes?

(A) 2 (B) 4 (C) 5 (D) 6