

Sr. No

[SET-V]
Ph.D. Programme (Odd Semester)
FOOD ENGINEERING & TECHNOLOGY

Marks: 100

Time: 2 hours

Roll No.: _____	Date: _____
Time: _____	Centre Name: _____

INSTRUCTIONS FOR THE CANDIDATES	
1.	Please do not open (Break the seal) of the question booklet before time
2.	An OMR answer sheet is being provided separately along with this question booklet. Please fill up all relevant entries like Roll number, Centre code, Paper Number etc. in the spaces provided on the OMR answer sheet and put your signature in the box provided for this purpose.
3.	There are 100 questions in this booklet. Against each question four alternative choices (A), (B), (C) and (D) are given, out of which only one is correct. Indicate your choice of answer by Darkening the suitable circle with Black/Blue Ball Pen in the OMR answer sheet supplied to you separately.
4.	Each question carries one mark. There will be 1/4th negative marking.
5.	Read and follow the instructions given on the backside of the OMR answer sheet carefully.
6.	Do not write your name/Roll number or give any identification mark at any place on the OMR sheet.
7.	Keep all your belongings outside the examination hall. Do not retain any paper except the ADMIT CARD.
8.	Do not talk to each other. Do not borrow anything from other candidates.
9.	Use of CALCULATOR (except programmable calculator) is allowed.
10.	Any body found involved in malpractices, will be disqualified from appearing in the entrance test.
11.	At the start of the examination, please ensure that all pages of your booklet are properly printed; your question booklet is not damaged in any manner and contains 100 questions. In case of any discrepancy, report to the invigilator immediately. No claim in this regard will be entertained at the later stage.

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For Rough Work

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NOTE:

- (i) Attempt all questions. Each question carries one mark. There will be $1/4^{\text{th}}$ negative marking.
- (ii) **There are 100 questions in this booklet.** Against each question four alternative choices (A), (B), (C) and (D) are given, out of which only one is correct. Indicate your choice of answer by Darkening the suitable circle with **Black/Blue Ball Pen** in the OMR answer sheet supplied to you separately.

1. **Most widely used agitator in the fermenter is**
 - (A) Impeller type
 - (B) Disc turbine type
 - (C) Scrapper type
 - (D) None of them
2. **In the fermenter, transfer of oxygen face**
 - (A) Least hurdle in the fermentation of unicellular broth
 - (B) Least hurdle in the fermentation of mycelium broth
 - (C) Both (A) & (B)
 - (D) None of them
3. **In a fermenter degree of the agitation is measured by**
 - (A) Amount of oxygen uptake by the microorganism
 - (B) Amount of power consumed in stirring the content of the fermenting vessel
 - (C) Amount of nutrient uptake by the microorganism
 - (D) None of them
4. **The DNA product resulting from restriction digestion to form**
 - (A) Sticky ends
 - (B) RNA strands
 - (C) non sticky ends
 - (D) None of them
5. **The effect irreversible inhibitor in the enzyme substrate reactions could be reduced by**
 - (A) Sedimentation
 - (B) Dialysis
 - (C) Centrifugation
 - (D) None of them
6. **Gram negative bacteria when subjected to crystal violet-iodine complex**
 - (A) Acquire color of the dye
 - (B) Do not acquire color of the dye
 - (C) Release mucilaginous compound
 - (D) None of them
7. **Food intoxication refers to poisoning**
 - (A) Ingestion of microorganism
 - (B) Microbial toxin produced in food prior to its consumption
 - (C) Both (A) & (B)
 - (D) None of them
8. **Closed -circular, double- stranded DNA molecules that replicate in the bacterial cytoplasm is**
 - (A) RNA
 - (B) Plasmid
 - (C) Chromosomes
 - (D) None of them
9. **Colony forming unit per milliliter (CFU/ ml) is calculated as**
 - (A) Average number of colonies /plate X dilution factor
 - (B) Average number of colonies / millilitre X dilution factor
 - (C) Both (A) & (B)
 - (D) None of them
10. **Pyrogalllic acid –sodium hydroxide technique is used in a broth to cultivate**
 - (A) Anaerobic microorganisms
 - (B) Aerobic microorganisms
 - (C) Both (A) & (B)
 - (D) None of them

- 11. Prokaryotes cells**
 (A) Contain membrane bound nucleus
 (B) Do not contain membrane bound nucleus
 (C) Both (A) & (B)
 (D) None of them
- 12. Chemically peptide bonds are**
 (A) Hydrogen
 (B) Electrostatic
 (C) Covalent
 (D) Both (A) & (B)
- 13. Chlorophyll is a tetrapyrroles contains**
 (A) Iron
 (B) Cupper
 (C) Magnesium
 (D) Calcium
- 14. The α – amino group are removed during metabolism by a process known as**
 (A) α -oxidation
 (B) Transamination
 (C) Amino-deoxygenation
 (D) None of them
- 15. In poultry processing, birds are subjected to scalding process at a temperature and time of**
 (A) 62° C/2 min
 (B) 52° C/2 min.
 (C) 85° C/3 min
 (D) None of them
- 16. Rigor mortis of poultry meat subsides with relaxation of muscles after**
 (A) 3 h or less
 (B) 6h or less
 (C) 10h or less
 (D) None of them
- 17. Most common method of grading of egg is**
 (A) Candling
 (B) Floating
 (C) Sliding
 (D) None of these
- 18. The ware-house storage of eggs is done at temperature and RH of**
 (A) –1 ° C/80% RH
 (B) –18° C/80%RH
 (C) –10° C/70%RH
 (D) None of them
- 19. Pasteurization of liquid egg is done at temperature and holding time**
 (A) 60-62° C/ 3-5-4.0 min
 (B) 70-72° C/ 3-5-4.0 min
 (C) C 80-82° C/ 3-5-4.0 min
 (D) None of them
- 20. Typical fishy odor in the fish is due to the formation of a compound**
 (A) Ethyle bromide
 (B) Dimethylamine
 (C) Trimethylamine
 (D) None of them
- 21. High quality low fat is frozen stored long period of time at**
 (A) –11 to -13° C
 (B) –21 to -23° C
 (C) –18 to -23° C
 (D) None of them
- 22. Most commonly used cryogenic liquid used in the immersion freezing is**
 (A) Liquid CO₂
 (B) Liquid N₂
 (C) Both (A)& (B)
 (D) Liquid SO₂
- 23. Normal food spoilage microorganism does not grow at**
 (A) 3.3° C
 (B) –9.5° C
 (C) –3.3° C
 (D) None of them
- 24. Activated sludge tanks are essentially large tanks where**
 (A) Air is naturally entrapped in the waste water
 (B) Air is bubbled through waste water
 (C) Both (A) & (B)
 (D) None of them
- 25. The residual chlorine level of water used in cleaning of food processing equipment is maintained at**
 (A) 3.5 ppm
 (B) 5.0ppm
 (C) 0.4ppm
 (D) None of them

26. For canning of highly acidic or corrosive food, the steel base plate is
 (A) MC type
 (B) MS type
 (C) L-type
 (D) None of them
27. Hermitically sealed container refers to
 (A) Sealed completely against the ingress of gases
 (B) Sealed completely against the ingress of vapor
 (C) Both (A) & (B)
 (D) None of them
28. A high quality chocolate should contain
 (A) 50% chocolate liquor and 50% sugar
 (B) 10% chocolate liquor and 50% sugar
 (C) 32% chocolate liquor and 50% sugar
 (D) None of them
29. In chocolate manufacture, conching is done at
 (A) 60° C for 96-120h
 (B) 70° C for 96-120h
 (C) 80° C for 96-120h
 (D) None of them
30. Tempering is done in chocolate manufacturing to check the
 (A) Fat bloom
 (B) Sugar bloom
 (C) Both (A) & (B)
 (D) None of them
31. The Melting point of cocoa butter is
 (A) 40-46° C
 (B) 30-36° C
 (C) 20-26° C
 (D) None of them
32. In hard candy manufacture, corn syrup
 (A) Enhances the sugar crystallization
 (B) Retard the sugar crystallization
 (C) No effect on sugar crystallization
 (D) None of them
33. The hydrolyzed mixture of dextrose and levulose is called
 (A) Dextrose syrup
 (B) Doctor sugar
 (C) Invert sugar
 (D) None of them
34. Corn syrup contains
 (A) Dextrose, maltose and dextrin
 (B) Mannose, Pentose and dextrin
 (C) Both (A) & (B)
 (D) None of them
35. Most naturally occurring unsaturated fatty acids are in the form of
 (A) Trans
 (B) Cis
 (C) Both (A) & (B)
 (D) None of them
36. The ripening of the cheddar cheese is done at
 (A) 3° C and 85% RH
 (B) -2° C and 85% RH
 (C) 2° C and 85% RH
 (D) None of them
37. Sweetened and condensed milk is not sterilized and it contains
 (A) 68% sugar
 (B) 89% sugar
 (C) 78% sugar
 (D) None of them
38. Time-temperature relationship for UHT processed milk is
 (A) 140° C and 2-3 Sec
 (B) 150° C and 2-3 Sec
 (C) 160° C and 2-3 Sec
 (D) None of them
39. A positive phosphatase test in milk processing indicates
 (A) Adequate pasteurization of milk
 (B) Inadequate pasteurization of milk
 (C) Presence of phospholipids
 (D) None of them
40. In sauerkraut production the salt concentration is maintained as
 (A) 2.0-2.5 %
 (B) 4.0-4.5%
 (C) 3-3.5%
 (D) None of them

- 41. In Ohmic heating the temperature gradient shows**
- (A) Significant difference in between outside and inside temperature
 - (B) No difference in between outside and inside temperature
 - (C) Only localized heating
 - (D) None of them
- 42. Loss factor term in micro wave heating refers to**
- (A) Depth penetration
 - (B) Rate of heating
 - (C) Both (A) & (B)
 - (D) None of them
- 43. Food product irradiated at dose up to 1Mrad (10kGy) are**
- (A) Considered safe and pose no toxic hazard
 - (B) Considered un safe and pose toxic hazard
 - (C) Limited formation and diffusion of free radicals
 - (D) Both (A) & (C)
- 44. Restriction endonucleases cut both strand of the DNA to generate**
- (A) 2'-OH and 5'-PO₄
 - (B) 3'-OH and 5'-PO₄
 - (C) 4'-OH and 5'-PO₄
 - (D) None of them
- 45. PCR amplify any fragment of DNA**
- (A) 66-70kbp size
 - (B) 0.2-40kbp size
 - (C) C. 50.2-60kbp size
 - (D) D None of them
- 46. Oligonucleotide primers for PCR are chemically synthesized and contain**
- (A) 10 nucleotide length
 - (B) 20 nucleotide length
 - (C) 30 nucleotide length
 - (D) None of them
- 47. Nucleic acid probes are used to**
- (A) to detect specific target DNA molecules
 - (B) to detect specific target RNA molecules
 - (C) to detect specific target SiRNA molecules
 - (D) None of them
- 48. The sweeteners used in the bakery goods include**
- (A) Sugar, glucose and maltose
 - (B) Lactose, galactose and fructose
 - (C) Maltose, amylose and cellulose
 - (D) Amylose, amylopectin and sugars
- 49. Gluten is composed of which protein fraction**
- (A) Prolamine and Gliadin
 - (B) Gluteline and Gliadin
 - (C) Albumin and globulin
 - (D) Gliadin and albumin
- 50. The top fermented beer is**
- (A) Ale
 - (B) Stout
 - (C) Portor
 - (D) All of them
- 51. The enzyme required to convert starch to sugar in brewing comes from**
- (A) Malt
 - (B) Adjunct add
 - (C) Un malted barley
 - (D) All of them
- 52. Chill proofing is the treatment given to beer to prevent**
- (A) Discoloration
 - (B) Further fermentation
 - (C) Flavour development
 - (D) Chill haze
- 53. According to the AACC the time – temperature used for moisture estimation of cereal**
- (A) 100° C for 2 h.
 - (B) 130° C for 1 h.
 - (C) 152° C for 1/2 h.
 - (D) 110° C for 1h.
- 54. α-amylase activity of wheat flour is determined by**
- (A) Dough ball test
 - (B) Falling number apparatus
 - (C) Pelshenke test
 - (D) Sedimentation test

55. Stickiness in cooked rice is high in kernel containing
 (A) High amylopectine
 (B) High Amylose
 (C) Both (A) & (B)
 (D) None of them
56. Commonly used microbial indicator of food safety is
 (A) *Citobacter*
 (B) *Cl.botulinum*
 (C) *E. coli*
 (D) *P putrefaciens*
57. Lowest pH at which *Cl. botulinum* can produce toxin is
 (A) 4.4
 (B) 5.4
 (C) 6.8
 (D) 7.0
58. Flat sour in canned food is due to
 (A) *Bacillus coagulance*
 (B) *Bacillus circulance*
 (C) *Bacillus cereus*
 (D) *Bacillus subtilis*
59. In the micro Kjeldahl method used for protein estimation, the released ammonia during distillation is entrapped in
 (A) Neutral boric acid
 (B) HCl
 (C) Neutral H₂O
 (D) NaOH
60. Firming agents used in fermented and pickled vegetables
 (A) Calcium chloride
 (B) Alum
 (C) Calcium citrate
 (D) All of them
61. Sunset yellow FCF is a synthetic colour below to the class
 (A) Xanthene
 (B) Azo
 (C) Pyrazolone
 (D) Indigoid
62. Antifoaming agent used during boiling of syrup, jellies and other fermentation process; is
 (A) Silicone
 (B) dimethyl polysiloxane
 (C) Both (A) & (B)
 (D) None of them
63. In chill proofing of beer most commonly used enzymes are
 (A) Cellulase & Hemicellulase
 (B) Papain & bromelin
 (C) Pectinase & Proteinase
 (D) None of these
64. The HLB value is calculated from an expression
 (A) $HLB = 20 (1-S/A)$
 (B) $HLB = 20 (1+S/A)$
 (C) $HLB = 20(1-A/S)$
 (D) None of them
65. In Quick freezing process, the zone of maximum ice crystal formation has time – temperature relationship as :
 (A) Fall of temperature 0° C to -3.3° C in less than 30 min..
 (B) Fall of temperature 0° C to -5.3° C in less than 30 min..
 (C) Fall of temperature 0° C to -7.6° C in less than 10 min..
 (D) None of them
66. Osmotic dehydration of apple, the process condition are
 (A) 90° Brix and 50° C temp
 (B) 80° Brix and 50° C temp
 (C) 70° Brix and 50° C temp
 (D) None of them
67. The range of water activities for common type of intermediate moisture food products are
 (A) 0.4 to 0.5
 (B) 0.6 to 0.8
 (C) 0.7.to 0.8
 (D) None of them

- 68. In spary drying of liquid using centrifugal disc atomization techniques operates at**
 (A) 3500rpm (small dia)
 (B) 4500rpm (small dia)
 (C) 2500rpm (small dia)
 (D) None of them
- 69. Maximum permissible limit of use of aspartame in processed food is**
 (A) 2%
 (B) 4%
 (C) 5%
 (D) None of them
- 70. Emulsifying agent used to stabilize the emulsion by the mechanism of**
 (A) By increasing the interfacial tension of the molecules.
 (B) By the dissolving oil droplets
 (C) By reducing the interfacial tension of the molecules.
 (D) None of them
- 71. Desired ration of oxygen and carbon dioxide in MAP for slow down respiration and prevent anaerobic condition is**
 (A) 1:5 to 1:6
 (B) 1:8 to 1:10
 (C) 1:11 to 1:20
 (D) None of them
- 72. One of the isoflavonoids found in soybean is**
 (A) Genistein
 (B) Daidzein
 (C) Both (A) & (B)
 (D) None of them
- 73. Metabolically active phenolic compounds useful for human health is**
 (A) Glucosidic form
 (B) Aglycone form
 (C) Both (A) & (B)
 (D) None of them
- 74. Beta-glucan found in oat is a**
 (A) Insoluble fibre
 (B) Soluble fibre
 (C) Acid soluble fibre
 (D) None of them
- 75. Tuna, Salmon and Mackerel contain high concentration of**
 (A) Omega-3 fatty acid
 (B) Eicosapentaenoic acid
 (C) Docosahexaenoic acid
 (D) All of them
- 76. The major antimicrobial protein of milk is**
 (A) Lactoferrin
 (B) Colostrum
 (C) Both (A) & (B)
 (D) None of them
- 77. Fructose-oligosccharides (FOS) used in the functional food as**
 (A) Prebiotic
 (B) Probiotic
 (C) Symbiotic
 (D) None of them
- 78. The health benefit of yogourt is to improve digestion of the lactose intolerant people, because it produces and releases enzymes**
 (A) β -amylase
 (B) α -galactosidase
 (C) β -galactosidase
 (D) None of them
- 79. Fresh fruit juice has**
 (A) High osmotic pressure
 (B) Low osmotic pressure
 (C) No osmotic pressure
 (D) None of them
- 80. The term chroma% or saturation% indicates**
 (A) How much color differ from gray
 (B) How much color differ from green
 (C) How much color differ from red
 (D) None of them
- 81. There are 10 lamps in a hall. Each one of them can be switched on independently. The number of ways in which hall can be illuminated is**
 (A) 10^2
 (B) 1023
 (C) 2^{10}
 (D) 10!

82. What is (?) in the following table?

8	54	27
9	71	?
10	90	45

- (A) 39
(B) 37
(C) 35.5
(D) 34.5

83. If 'THIS MAN IS GOOD' is coded as 153. What will be the code for 'THAT MAN IS NOT GOOD'?

- (A) 200
(B) 195
(C) 190
(D) 180

84. A earned Rs 84000. One third of it went to taxes. The rest was invested and appreciated by one half. Two third of that went into business. Additional tax was paid equal to $\frac{2}{3}$ of the remaining amount. How much money was left with A?

- (A) 8790
(B) 8777
(C) 9000
(D) 9333

85. If Aneesh is paternal first cousin of Rahul, how is their father's mother is related to them?

- (A) Mother
(B) Grandmother
(C) Paternal aunt
(D) Maternal aunt

86. I got my first job on May 22, 1983. Which day of the week it was?

- (A) Monday
(B) Tuesday
(C) Friday
(D) Sunday

87. A petrol dealer adds 20% kerosene oil to petrol. If purchase price of petrol is Rs. 60 per litre and that of kerosene is Rs. 20 per litre, and sale price of the petrol is Rs. 61 per litre, what is his percentage profit?

- (A) 14.25
(B) 14.37

- (C) 14.50
(D) 14.70

88. Anant parked his motorcycle at 9th place from the left and 28th from the right. How many motorcycles are parked in the row?

- (A) 37
(B) 36
(C) 35
(D) 34

89. In an imaginary language digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are substituted by t, d, j, o, r, m, u, x, b and z. 10 is written as dt and so on. Use the above information and find the value of expression given below:

$$\{(or - dj) \times u\} \div dj$$

- (A) 9
(B) 10
(C) 11
(D) 12

90. Seven friends meet at their college reunion, shake hand with each other once. How many hand shake will be there altogether?

- (A) 21
(B) 42
(C) 27
(D) 49

91. Ms Anandita starts at left and moves 8 Kms. She then turns right and moves 4 Kms. Then she turns right again for 8 Kms. How far is she from the initial position?

- (A) 20 Kms
(B) 10 Kms
(C) 08 Kms
(D) 04 Kms

92. Lunch-dinner pattern of a person for 'm' days is given below. He has a choice of VEG or NON-VEG meal for his lunch/dinner.

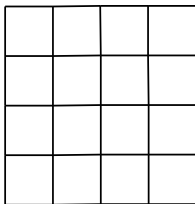
- (i) If he takes a NON-VEG lunch, he will have only VEG dinner
(ii) He takes NON-VEG dinner for 9 days
(iii) He takes VEG lunch for 11 days
(iv) He takes a total of 14 NON-VEG meals

What is 'm'?

- (A) 18
(B) 20
(C) 24
(D) 38

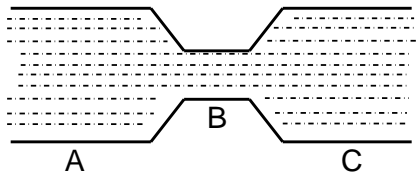
93. 20% students of a particular course get jobs within one year of passing. 20% of the remaining students get jobs by end of the second year of passing. If 16 students are still jobless, how many students had passed the course?
- (A) 25
(B) 50
(C) 62
(D) 84

94. How many rectangles (which are not squares) in the following figure?



- (A) 56
(B) 70
(C) 80
(D) 96

95. Water is flowing through a tube as shown below:



The cross-sectional area of A and C are equal and greater than the cross-sectional area of B. If the flow of water is steady, then the pressure on the walls at B is

- (A) less than that at A and that at C
(B) more than that at A and that at C
(C) same as that at A and that at C
(D) more than that at A but less than that at C

96. Processor IC chip was developed by?

- (A) AMD
(B) Intel
(C) DIX
(D) Both (A) and (B)

97. If $5472 = 9$, $6342 = 6$, $7584 = 6$. What is 9236?

- (A) 2
(B) 3
(C) 4
(D) 5

98. Chipko movement was started by?

- (A) Arundhati Roy
(B) Medha Patkar
(C) Ila Bhatt
(D) Sunder lal Bahuguna

99. What is the following is not a natural hazard?

- (A) Earthquake
(B) Tsunami
(C) Flash floods
(D) Nuclear accident

100. Which of the following team won the 9th IPL cricket T-20 tournament?

- (A) Kolkata Knight Riders
(B) Sun Risers Hyderabad
(C) Mumbai Indians
(D) Royal Challengers Bangalore