CET(PG)-2015

Sr. No. : 216058

Question Booklet Series : A

Important : Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet.

Roll No. *In Figures* *In Words*

O.M.R. Answer Sheet Serial No.

Signature of the Candidate :

Subject : M.E. (Food Techonology)

Time : 90 minutes **Number of Questions : 75** **Maximum Marks : 75**

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal gently when asked to do so.
5. Please check that this Question Booklet contains **75** questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
10. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
12. The Answer Sheet is designed for **computer evaluation**. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so, would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculator is not allowed.**

SEAL

1. **Tocopherol is chemical name of vitamin :**

   (A) D (B) E

   (C) K (D) B_6

2. **Which of the following factors affects the growth of microorganism ?**

   (A) Water activity (aw) (B) pH

   (C) O-R Potential (D) All of these

3. **The enzymatic reaction rate is reduced to half by decreasing the temperature by :**

   (A) 10°C (B) 15°C

   (C) 20°C (D) None of these

4. **The chemical name of Vitamin B_1 is :**

   (A) Thiamin (B) Cobalamin

   (C) Niacin (D) None of these

5. **Which of the following enzymes is responsible for off-flavor development in cream and butter ?**

   (A) Lipase (B) Protease

   (C) Peroxidase (D) None of these

6. **Which of the following is a milk sugar ?**

   (A) Lactose (B) Fructose

   (C) Sucrose (D) None of these

7. **Glutamic acid is used as a /an :**

   (A) flavour enhancer (B) antioxidant

   (C) humectant (D) emulsifier

8. **Salt is a better food preservative than sugar because it :**

   (A) has lower molecular weight

   (B) lowers the vapour pressure of food water by a larger extent

   (C) kills microorganisms better

   (D) reduces pH

9. **The fiber in food that produces necessary dietary roughage is largely :**

   (A) cellulose (B) hemicelluloses

   (C) dextrin (D) pectin

10. **Pectin and gums are added to foods as :**

(A) thickeners and stabilizers

(B) emulsifier

(C) humectant

(D) colorant

11. **A typical fat molecule consists of glycerol combined with :**

(A) three fatty acids

(B) two fatty acids

(C) four fatty acids

(D) one fatty acid

12. **Lecithins are structurally like fats but contain :**

(A) Oxalic acid

(B) Citric acid

(C) Phosphoric acid

(D) Capric acid

13. **Which of the following metals are strong promoters of oxidation ?**

(A) Sodium and Iron

(B) Sodium and Aluminum

(C) Aluminum and Copper

(D) Copper and Iron

14. **Vitamin C and E act as :**

(A) Antioxidants

(B) Emulsifiers

(C) Stabilizers

(D) Humectants

15. **Carotene gives the :**

(A) orange color

(B) red color

(C) green color

(D) purple color

16. **Fat soluble vitamins are :**

(A) A, D, E & K

(B) A, D, C & K

(C) A, C, E & K

(D) A, B, E & K

17. **At very low pressure, the thermal conductivity of gases approaches :**

(A) maximum

(B) zero

(C) negative

(D) none of these

18. **When a liquid is placed in a sealed container, molecules of liquid evaporate into the space above th liquid. After equilibrium is reached, this vapour will exert a pressure which is called :**

(A) partial pressure

(B) absolute pressure

(C) vapour pressure

(D) total pressure

SEAL

19. In transient heat transfer problems, the dimensionless number used is :

(A) Nusselt Number
(B) Prandtl Number
(C) Biot Number
(D) Schmidt Number

20. Three consecutive sieves and a pan retain 20%, 50%, 20% and 10% of ground material respectively. The fineness modulus of the ground material is :

(A) 1.2
(B) 1.8
(C) 2.4
(D) 3.5

21. A countercurrent heat exchanger carrying the same flow rate of the same liquid as hot and cold streams has an NTU (number of transfer unit) of 3.The effectiveness of the heat exchanger is :

(A) 0.60
(B) 0.65
(C) 0.70
(D) 0.75

22. It is found that the energy required to reduce particles from a mean diameter of 10 mm to 3 mm is 11 kJ/kg. The energy required to reduce the same material from a diameter of 1 mm to 0.3 mm by Rittinger's law is :

(A) 10 kJ/ kg
(B) 11 kJ/kg
(C) 100 kJ/kg
(D) 110 kJ/kg

23. 100 kg of fish is cooled from 30 °C to –20 °C. The specific heat of fish above and below freezing point are 3.18 kJ/kg K, 1.72 kJ/ kg K and 1.72 kJ/ kg K respectively. The initial freezing point of fish is –2.5 °C and the latent heat of freezing is 250 kJ/ kg. The total heat load to cool the fish in kJ is :

(A) 33575
(B) 35165
(C) 36025
(D) 38345

24. A cold storage is made of composite wall consisting of 25 mm concrete, 100 mm brick, 100 mm thermocole and 5 mm plywood having thermal conductivities of 0.76 W/mK, 0.69 W/mK, 0.024 W/mK and 0.2 W/mK respectively. The inside and outside wall temperatures are 2 °C and 36 °C respectively. The rate of heat gain in W/m^2 by the cold storage is :

(A) 7.78
(B) 9.31
(C) 12.66
(D) 5.62

25. When vaporisation takes place directly at the heating surface, it is called :

(A) film boiling
(B) nucleate boiling
(C) vapour binding
(D) none of these

26. **With increase in porosity, the thermal conductivity of a solid material :**

(A) increases (B) decreases

(C) remains unchanged (D) may increase or decrease

27. **Hot water at a flow rate of 0.01 m^3 /min enters the tube side of a counter current shell and tube he exchanger at 80 °C and leaves at 50 °C. Cold oil at a flow rate of 0.05 m^3/min of density 800 kg/m^3 a specific heat of 2 kJ/kg K enters at 20°C. The log mean temperature difference in °C approximately :**

(A) 32 (B) 37

(C) 45 (D) 50

28. **The dimensionless group in mass transfer that is equivalent to Prandtl number in heat transfer is :**

(A) Nusselt number (B) Sherwood number

(C) Schmidt number (D) Stanton number

29. **Dietus-Boelter equation used for the determination of heat transfer co-efficient is valid for :**

(A) laminar flow (B) turbulent flow

(C) plug flow (D) transition flow

30. **The dimensionless number which represents the ratio of drag force to inertial force is :**

(A) Power number (B) Reynolds number

(C) Lewis number (D) Nusselt number

31. **The law which describes the molecular diffusion is known as :**

(A) Fourier's law (B) Fick's law

(C) Kick's law (D) None of these

32. **Unsteady state unidirectional heat transfer in a solid can be expressed as** $\frac{\partial T}{\partial \theta} = \alpha \frac{\partial^2 T}{\partial x^2}$ **where** α **is**

(A) thermal conductivity (B) thermal diffusivity

(C) heat flux (D) mass diffusivity

33. **The SI unit of heat flux is given by :**

(A) J/s m^2 (B) J/s

(C) J/m^2 (D) None of these

34. The product of Reynolds number and Prandtl number which occurs in the laminar flow correlation is called :

(A) Peclet number
(B) Nusselt number
(C) Lewis number
(D) None of these

35. The LMTD for counter current flow in a heat exchanger where one stream rises from 20 to 70 °C and other falls from 95 to 80 °C is :

(A) 40°C
(B) 45°C
(C) 50°C
(D) 60°C

36. The ratio of molecular diffusivity of momentum to molecular diffusivity of mass is designated as :

(A) Schmidt number
(B) Sherwood number
(C) Prandtl number
(D) Reynolds number

37. Two plates spaced 150 mm apart are maintained at 1000°C and 70°C. The heat transfer will take place mainly by :

(A) radiation and convection
(B) free convection
(C) forced convection
(D) radiation

38. The temperature distribution across a slab for conduction heat transfer is :

(A) exponential
(B) nonlinear
(C) constant
(D) linear

39. At what temperature will the Celsius and Fahrenheit scales read the same ?

(A) –40°C
(B) +40°C
(C) –25°C
(D) +25°C

40. The temperature in Fahrenheit scale (F) and Celsius scale (C) are related as :

(A) F=1.8*C+32
(B) F=0.8*C+32
(C) F=1.8*C–32
(D) None of these

41. The number which is the ratio of the mean free path to the flow diameter is called :

(A) Reynolds number
(B) Prandtl number
(C) Knudsen number
(D) None of these

42. The dimensionless numbers which relate both heat and mass transfer is :

(A) Reynolds number
(B) Prandtl number
(C) Lewis number
(D) None of these

[Turn over

43. **The SI unit of specific cake resistance is :**

(A) m^{-1} (B) kg/m

(C) m^2/kg (D) m/kg

44. **The slope of the graph between shear stress and shear rate for a Newtonian fluid should be :**

(A) Tan 45° (B) Tan 60°

(C) Tan 30° (D) Tan 90°

45. **Which law of thermodynamics is the basis for refrigeration cycle ?**

(A) First law of thermodynamics (B) Second law of thermodynamics

(C) Third law of thermodynamics (D) None of these

46. **In a sterilization process of milk, 9 log cycle reduction of *B. stearothermophilus* organism is to b achieved. The values of D_{140} and Z_{140} for this spore are 1.62 s and 10.35°C respectively. The value D_{145} should be :**

(A) 0.634 s (B) 0.533 s

(C) 1.5 s (D) 0.753 s

47. **The F value at 121.1°C equivalent to 99.999 % inactivation of C. botulinum is 1 minute. The D_0 valu is :**

(A) 0.1 min (B) 0.2 min

(C) 0.3 min (D) 0.25 min

48. **Bacteria reproduce by a process called :**

(A) Binary fission (B) Binary fusion

(C) Binary diffusion (D) None of these

49. **The destruction of microorganisms by steam may be described as :**

(A) zero order reaction (B) second order reaction

(C) first order reaction (D) None of these

50. **Aspergillus niger is the principal mold used in the production of :**

(A) Lactic acid (B) Citric acid

(C) Sorbic acid (D) Benzoic acid

51. **Which of the following is used most extensively in the prevention of mold growth and rope developmen in baked foods ?**

(A) Sodium propionate (B) Sodium benzoate

(C) Sodium acetate (D) Sodium carbonate

52. **Radiation sterilization is also known as :**

(A) Radicidation (B) Radurization

(C) Radappertization (D) None of these

53. **Hydrogen swell is related to :**

(A) Aseptic processing (B) Freezing

(C) Irradiation processing (D) Canning

54. **The chief microorganism responsible for the spoilage of honey is :**

(A) Osmophilic (B) Thermophilic

(C) Thermoduric (D) Mesophilic

55. **Clostridium botulinum is :**

(A) Acrobic bacteria (B) Anaerobic bacteria

(C) Facultative bacteria (D) None of these

56. **Ropiness in bread is caused by :**

(A) B. stearothermophilus (B) Bacillus subtilis

(C) Clostridium botulinum (D) Salmonella

57. **Green rots of egg is caused by :**

(A) Pseudomonas fluorescens (B) Bacillus subtilis

(C) Clostridium botulinum (D) Salmonella

58. **The role of microorganisms in the spoilage of wine and milk was discovered by :**

(A) Louis Pasteur (B) Mike Lewis

(C) H. Burton (D) Nicholas Appert

59. **Which of the following foods is rich in omega-3 fatty acids ?**

(A) Fatty fish (B) Butter

(C) Vegetable oil (D) Olive oil

60. **A food with a pH of 3.5 is considered to be :**

(A) Low acid (B) High acid

(C) Medium acid (D) Non-acid

61. **Which of the following gases is responsible for the ripening of fruits ?**

(A) Ethane (B) Carbon dioxide

(C) Ethylene (D) Propane

62. **Which of the following foods is produced by fermentation involving lactic acid bacteria ?**

(A) Yoghurt (B) Vinegar

(C) Beer (D) None of these

63. **Percentage of fat in butter is :**

(A) 50 (B) 60

(C) 70 (D) 80

64. **The power consumed by a drum dryer depends upon :**

(A) Drum speed (B) Steam Pressure

(C) Pressure exerted by the blade on the drums (D) Length and diameter of the drum

65. **Ultra filtration is used for production of :**

(A) Butter (B) Ghee

(C) Cheese (D) Ice-cream

66. **Vacuum packaging is normally used for :**

(A) milk powder (B) paneer

(C) yoghurt (D) None of these

67. **The water activity of free water should be :**

(A) 1 (B) less than one

(C) more than one (D) 0

68. **The major forces acting in cyclone separator are :**

(A) gravity and centrifugal (B) gravity and centripetal

(C) centrifugal and centripetal (D) none of these

69. **Microwave drying is the one of the examples of :**

(A) radiation drying (B) dielectric drying

(C) pneumatic drying (D) vacuum drying

70. **Microfiltration is used in dairy industry for separating :**

(A) fat (B) minerals

(C) protein (D) microbes

71. **Which industrial processing method is most effective for making dried potato flakes ?**

(A) Drum drying
(B) Sun drying
(C) Spray drying
(D) Tray Drying

72. **At 100% relative humidity, wet bulb temperature of air is :**

(A) more than dew point temperature
(B) less than dew point temperature
(C) same as dew point temperature
(D) none of these

73. **The main aim of blanching of fruits and vegetables is to :**

(A) reduce microbial load
(B) inactivate enzymes
(C) modify texture
(D) improve appearance

74. **Chill injury is most common in :**

(A) Banana
(B) Apple
(C) Mango
(D) Grape

75. **In modified atmospheric packaging, the potassium permanganate is used as :**

(A) Moisture absorber
(B) Ethylene absorber
(C) Ethylene producer
(D) Carbon dioxide absorber