Sr. No. .....6021.....

Ph.D. ENTRANCE TEST-2023

SUBJECT (FOOD SCIENCE & TECHNOLOGY)

Total Questions: 100
Time Allowed : 110 Minutes

Roll No. | | | | | | |

Instructions for Candidates

1. Write your roll number in the space provided at the top of this page of question booklet and fill up the necessary information in the spaces provided on OMR Answer sheet.
2. OMR Answer sheet has an original copy and a candidate's copy glued beneath it at the top. While making entries in the original copy, candidate should ensure that the two copies are aligned properly so that the entries made in the original copy against each item are exactly copied in the candidate's copy.
3. All entries in the OMR answers sheet including answers to questions are to be recorded in the original copy only.
4. Use only blue/ black ball point pen to darken the circle of correct / most appropriate response. In no case gel/ ink pen or pencil should be used.
5. **Do not darken more the one circle of option for any question. A question with more than one d response shall be considered wrong.**
6. **There will be no "Negative Marking" for wrong answers.**
7. Only those candidates who would obtain positive score in entrance test examination shall be eligible admission
8. Do not make any stray mark on the OMR sheet
9. Calculators and mobiles shall not be permitted inside the examination hall
10. Rough work, if any, should be done on the blank sheets provided with the question booklet.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated in such case it will not be evaluated.
12. Ensure that your OMR Answer sheet has been signed by the invigilator and the candidate himself/herself.
13. At the end of the examination hand over the OMR answer sheet to the invigilator who will first tear off the original OMR sheet in presence of the candidate and hand over the candidate's copy to the candidate.
14. If any of the information in the response sheet/question paper has been found missing or not mentioned as stated above the candidate is solely responsible for that lapse.

Part I (General Aptitude 2023)

1. Tariq wants to sell a watch at a profit of 20%. He bought it at 10% less and sold it at ₹ 30 less, but still he gained 20%. The cost price of watch is.....

   A. ₹ 250
   B. ₹ 225
   C. ₹ 240
   D. ₹ 220

2. If today is Sunday then three days from now will be....

   A. Saturday
   B. Friday
   C. Thursday
   D. Wednesday

3. Absar is brother of Mehdi. Iqra is sister of Gulshan. Mehdi is son of Iqra. How is Absar related to Iqra?

   A. Son
   B. Brother
   C. Nephew
   D. Father

4. Ankit can do a piece of work in 6 days and Basharat in 9 days. How many days will both take together to complete the work?

   A. 7.5 days
   B. 5.4 days
   C. 3.6 days
   D. 3 days

5. The book "To Hell and Back: Humans of COVID" is authored by?

   A. Kavitha Iyer
   B. Jhumpa Lahiri
   C. Barkha Dutt
   D. Arundhati Roy

6. If PARTICLE is coded RCTVKENG, then how is SCIENCE coded?

   A. TBJUOMF
   B. TDJFODF
   C. UEKGPEG
   D. QBSUDMF

7. Where is the headquarter of the United Nations Environment Programme (UNEP) located?

   A. Nairobi, Kenya
   B. Venice, Italy
   C. Munich, Germany
   D. Geneva, Switzerland

8. Two years ago, Jane's age was three times Sam's age. If Jane is now 18, how old is Sam?

   A. 6 years
   B. 8 years
   C. 10 years
   D. 12 years

9. If WORK is coded as 4-12-9-16, then how will WOMAN be coded?

   A. 4-12-14-26-13
   B. 4-26-14-13-12
   C. 23-12-26-14-13
   D. 123-15-13-1-14

10. Which of the following states is not included in the sixth schedule of Indian Constitution?

    A. Meghalaya
    B. Tripura
    C. Mizoram
    D. Manipur

11. Letter : Word

A. Homework : School

B. Club : People

C. Product : Factory

D. Page : Book

12. The speed of a bus is 54 km/h if we don't let it stop at any point. If the bus stops at the bus-stops, the speed of the bus is 45 km/h. What is the time that the bus stops for per hour?

A. 7 mins

B. 10 mins

C. 21 mins

D. 22 mins

13. Blood does not coagulate inside the body due to the presence of _____?

A. Fibrin

B. Haemoglobin

C. Heparin

D. Plasma

14. If a triangle has angles measuring 30 degrees, 60 degrees, and 90 degrees, what type of triangle is it?

A. Equilateral

B. Isosceles

C. Scalene

D. Right-angled

15. The ..... of the Minister's statement cannot be verified by people who have no access to official records.

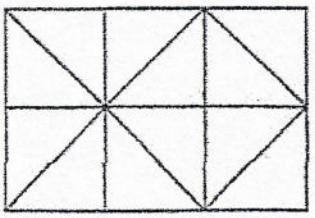
A. veracity

B. verbosity

C. ambiguity

D. validity

16. The number of squares in the given figure is.....



A. 7

B. 8

C. 9

D. 10

17. What is the percentage of profit if the cost price is 95% of the selling price?

A. 5%

B. 5.26%

C. 4%

D. 4.75%

18. If you start facing east and turn 135 degrees clockwise, which direction are you facing now?

A. North

B. West

C. North-East

D. South-East

19. Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) has been extended till which year recently?

A. 2025

B. 2028

C. 2030

D. 2032

20. Who is the present chairman of ISRO?

A. Sh. Heeralal Samariya

B. Sh. Harsh Chouhan

C. Sh. Ravneet Kaur

D. Sh. S Somanath

End of Part I

PART- II

Q21. _____ is known as "father of Practical Bacteriology".

a) John Tyndall
b) Louis Pasteur
c) Francesco Redi
d) Robert Koch

Q22. Reciprocal of the generation time "g" is termed as

a) Synchronous growth
b) Growth rate
c) Cell mass
d) Exponential growth

Q23. A highly oxidized substrate has a _____O-R potential (Eh)

a) Negative
b) Positive
c) 0
d) Both a & b

Q24. Most of the mushrooms, plant rusts and smuts form a type of sexual sporeknown as

a) Oospores
b) Zygospores
c) Chlamydospore
d) Basidiospore

Q25. Lower limit of water activity for ordinary yeast ranges from

a) 0.62 to 0.65
b) 0.80 to 0.90
c) 0.88 to 0.94
d) 0.60 to 0.71

Q26. Which type of *C. Botulinum* toxin cause disease in humans

a) Type D
b) Type B
c) Type C
d) All of the above

Q27. Alimentary toxic aleukia (ATA) is caused by ingestion of

a) Fusariogenin
b) Patulin
c) Luteoskyrin
d) Ochratoxin

Q28. The nucleic acid content of bacterial SCP may be as high as

a) 14 %
b) 15 %
c) 16%
d) 20 %

Q29. Condensation of the anomeric hydroxyl of glucose with the hydroxyl of an alcohol or phenol, results in formation of

a) S-glycosides
b) Cyanogenic glycosides
c) O-glycoside
d) Sialic acid

Q30. 5,8,11,14-Eicosatetraenoic acid is

a) Myristoleic acid
b) Oleic acid
c) Arachidonic acid
d) Saturated fatty acid

Q31. Controlled removal of the heat of transformation during fat crystallization to favour formation of polymorphic form is known as

a) Conditioning
b) Tempering
c) Melting
d) Stabilization

Q32. Carotenes have _____colour in trans configuration

a) Lemon yellow
b) Orange yellow
c) Pale yellow
d) Orange red

Q33. Lowest hydration of protein occurs at which pH

a) Above isoelectric
b) Below isoelectric
c) At isoelectric
d) None of the above

Q34. If NO_2 group is added at meta position in saccharin, it becomes

a) Very sweet
b) Taste less
c) Very bitter
d) Sweet

Q35. EPA & DHA can be produced from

a) Oleic acid
b) Linolenic acid
c) Arachidonic acid
d) Gamma-linolenic acid

Q36. Action of β-fructofuranosidase in sucrose produces

a) Cellobiose
b) Acetyl glucose
c) Fructo-oligosaccharides
d) None of the above

Q37. Negative slope index of a thermal death time curve is known as

a) D value
b) F value
c) Z value
d) F_0 value

Q38. *C. Botulinm* will not grow in foods at pH value of

a) ≤ 6.4
b) ≤ 4.6
c) ≤ 5.4
d) ≤ 3.5

Q39. Migration of molecules from a polymer package into a food can be described by

a) Ohm's law
b) Henry law
c) Ficks law
d) Bond's law

Q40. The threshold of regulation (TOR) applies when the overall dietary concentration of a packaging material migrant is

a) < 5 ppb
b) < 0.5 ppb
c) < 0.2 ppb
d) < 1.5 ppb

Q41. Films with an oxygen permeability not exceeding _____ are recommended for packages in which oxygen scavengers are used

a) > 100 $ml/m^2.d.atm$
b) > 50 $ml/m^2.d.atm$
c) < 20 $ml/m^2.d.atm$
d) < 10 $ml/m^2.d.atm$

Q42. VITSAB TTI is a _____ type of indicator used in intelligent packaging system

a) Enzymatic
b) Polymer based
c) Diffusion based
d) Sorption based

Q43. Lactic acid produced by fermentation is exclusively a

a) D isomer
b) L isomer
c) meso-Lactide
d) None

Q44. Most commercially important epoxy resins are derived from

a) Bisphenol A
b) Resole phenolics
c) Epichlorohydrin
d) Epoxidized soyabean oil

Q45. Cyclone is a component of

a) Freeze drier
b) Cabinet drier
c) Fluidized bed drier
d) Spray drier

Q46. Strength of gamma radiations is expressed in terms of

a) Gray
b) Electron volt
c) Roentgen
d) Joules

Q47. The degree of penetration of microwaves into food is measured by

a) Dielectric constant
b) Half power depth
c) Loss factor
d) Full power depth

Q48. Shelf life of IMF is better predicted by their

a) T_g b) T_m

c) a_w d) ERH

Q49. 500 Kg of paddy at 22 % moisture content (w.b) is dried to 14 % moisture content (w.b) for milling. Calculate the amount of moisture removed in drying.

a) 45.41 Kg b) 46.51 Kg

c) 47 Kg d) 43.12 Kg

Q50. Fourth layer in tetra pack is made up of

a) Polyethylene b) Paperboard

c) Aluminium foil d) Polypropylene

PART- III

Q51. Which type of steel is used in vegetable and meat packaging

a) D type b) MR type

c) N type d) L type

Q52. The radial heat transfer rate through hollow cylinder increases as the ratio of outer radius to inner radius

a) Increases b) Decreases

c) Constant d) None of the above

Q53. Which of the following are achromatic colors?

a) White, blue, grey b) Red, blue, yellow

c) White, yellow, black d) White, black, grey

Q54. Lovibond system is mostly used for

a) Pastes b) Syrups

c) Oils d) Jams

Q55. Braggs equation is used in

a) NMR b) X-Ray Fluorescence

c) FTIR d) ICPMS

Q56. Prominent amino acid in fish which contribute to sweetness

a) Glycine b) Methionine

c) Proline d) Lysine

Q57. In SI system, unit of viscosity is

a) Poise
b) Ns/m^2
c) g/cm.s
d) m^2/s

Q58. Which of the following is not in the Beer's equation?

a) Concentration
b) Cell path length
c) Light wavelength
d) Molar absorptivity

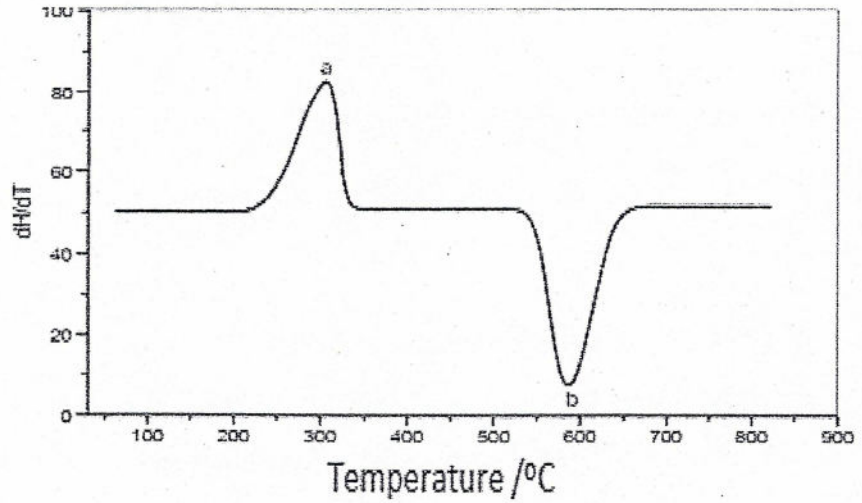
Q59. Liquefaction number has _____ relation with falling number

a) Linear
b) Inverse
c) Quadratic
d) None

Q60. DSC is used to measure

a) Specific heat
b) Thermal conductivity
b) Electrical conductivity
d) Magnetic field

Q61. "b" in the graph below depicts



a) Endothermic peak
b) Exothermic peak
c) T_g
d) Crystallization peak

Q62. In power law model, n>1 represents

a) Newtonian fluid
b) non-Newtonian fluid
c) Shear-thinning fluid
d) Shear-thickening fluid

Q63. Polar mobile phase and non-polar stationary phase is used in

a) Normal phase chromatography

b) Reverse phase chromatography

c) Gas chromatography

d) Affinity chromatography

Q64. In the texture profile analysis, ratio of lengths of compression in the second and first plunge (L_2/L_1) depicts

a) Adhesiveness of the product

b) Springiness of the product

c) Gumminess

d) Stringiness

Q65. Standard deviation is independent of change of

a) Origin

b) Scale

c) Both A & B

d) None of the above

Q66. The most stable measure of central tendency for qualitative data is

a) Mode

b) Arithmetic Mean

c) Geometric Mean

d) Median

Q67. In an equation y = a+bx, b is the

a) Slope

b) Intercept

c) Both A & B

d) None of the above

Q68. If t=8, r= 3, then error degrees of freedom in case of CRD will be

a) 17

b) 16

c) 18

d) 19

Q69. Germ of maize grains constitutes about ---------- % of total weight kernel.

a) 11.1 %

b) 12 %

c) 12.5 %

d) 13.1 %

Q70. Thickness of aleurone in japonica rice is

a) Two to four layers

b) Two to three layers

c) Five to Six layers

d) Four to five layers

Q71. Most of the B vitamins in grains are present in

a) Endosperm

b) Scutellum

c) Germ

d) both b & c

Q72. Gluten proteins are rich in

a) Glutamine & proline
b) Glutamine & tryptophan
c) Glutamine & arginine
d) Lysine & arginine

Q73. During maturation or ageing of flour

a) Sulfhydryl groups decreases
b) disulphide bond decreases
c) Sulfhydryl groups increases
d) both b & c

Q74. In dry milling of corn, largest fraction of _____ is obtained

a) Hominy
b) Grits
c) Fine meal
d) Flour

Q75. Protein content in rice bran is

a) 8-10 %
b) 16-17 %
c) 15-16 %
d) 17-20 %

Q76. Liquor made from pearled barley, yeast and koji is

a) Miso
b) Shochu
c) Saki
d) Kefir

Q77. Flour stream obtained from final break and lower reduction passage exhibits

a) Good baking tolerance
b) Lower baking tolerance
c) Highest baking tolerance
d) Lowest ash content

Q78. The paddy grain is more buoyant than the brown rice

a) False
b) True
c) May be
d) None

Q79. Expansion valve in mechanical refrigerator operates at

a) High pressure
b) Zero pressure
c) Low pressure
d) None of the above

Q80. Tick the correct sequence of unit operations followed in oil refining

a) Neutralization, Deodorization, Bleaching, Degumming
b) Neutralization, Degumming, Deodorization, Bleaching
c) Degumming, Neutralization, Bleaching, Deodorization
d) Degumming, Bleaching, Deodorization, Neutralization

Q81. Fruits such as plum, grapes, strawberry are canned in

a) Plain cans
b) AR cans
c) SR cans
d) Jars

Q82. In jelly formation, sugar acts as a precipitating agent and the presence of acid helps it. It is stated in

a) Fibril's theory
b) Hinton's theory
c) Olsen's theory
d) Spencer's theory

Q83. Rapid set pectin has degree of methoxylation of over

a) 75 %
b) 72 %
c) 70 %
d) 80 %

Q84. BOAA responsible for spastic paralysis is present in

a) *Leucaena glania*
b) *Vicia faba*
c) *Phaseolum lunatus*
d) *Lathyrus sativus*

Q85. Casein exists in milk in the form

a) Caseinate-phosphate calcium complex
b) Caseinate calcium phosphate complex
c) Calcium caseinate-phosphate complex
d) Calcium complexes

Q86. Specific gravity of milk is increased by

a) Addition of water
b) Addition of cream
c) Removal of fat
d) Removal of skim milk

Q87. Highest percent of milk fat is present in

a) Whipping cream
b) Table cream
c) Coffee cream
d) Plastic cream

Q88. Ageing of ice-cream mix is done

a) After freezing
b) After hardening
c) Before freezing
d) Before hardening

Q89. Total milk solids present in sweetened condensed milk are

a) 31%
b) 20 %
c) 20.1 %
d) 30 %

Q90. Alcohol index of stable milk is

a) 3 b) 5

c) 7 d) 10

Q91. Seeding of lactose done in manufacture of condensed milk is done to

a) Facilitate cooling b) Prevent coagulation

c) Prevent large crystal formation d) For standardization

Q92. Thermostabilization of egg is carried out at

a) 60-61.5 °C for 3.5 to 4.0 min b) 53.4 °C for 10 min

c) 54 °C for 15 min d) 54.5 °C for 10 min

Q93. Fish protein concentrate contains

a) 80-90 % protein b) 85-95 % protein

c) 85-92 % protein d) 100 % protein

Q94. _____ is composed of only thick filaments in muscles

a) Z line b) A band

c) H band d) I band

Q95. Carcass of young sheep usually from 12 and about 20 months old are termed as

a) Mature mutton b) Calf

c) Steer d) Yearling mutton

Q96. Acute short-term stress around the time of slaughter in animals leads to_____ meat

a) DFD b) PSE

c) High pH d) All of the above

Q97. Liquid egg is pasteurized at

a) 88 °C for 15 sec b) 64.4 °C for 25 min

c) 65 °C for 30 min d) 80 °C for 15 sec

Q98. The inhibitory substance in raw egg white that inhibits *Salmonella enterititis*

a) Lactoferrin
b) Ovotransferrin
c) Conalbumin
c) Ovoalbumin

Q99. Yolk is enclosed in a

a) Chalaziferous layer
b) Vitelline membrane
c) Albuminous sac
d) Cuticle

Q100. Excellent foaming property of egg white is due to

a) Ovomucoid
b) Ovomucin
c) Avidin
d) Ovoglobulin