Sr. No. 181

ENTRANCE TEST-2024

SCHOOL OF APPLIED SCIENCES & TECHNOLOGY

FOOD TECHNOLOGY

Question Booklet Series **A**

Total Questions : 60

Time Allowed : 70 Minutes

Roll No. : | | | | | | |

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SEAL

1. DNA is not present in one of the following :
   (A) Mitochondria
   (B) Chloroplast
   (C) Bacteriophage
   (D) Tobacco mosaic virus

2. A cell increases in volume when placed in a solution which is :
   (A) Isotonic
   (B) Slightly hypertonic
   (C) Hypotonic
   (D) Extremely hypertonic

3. What is the function of DNA ligases ?
   (A) It catalyses the formation of phosphodiester bonds between two DNA fragments
   (B) It catalyses hydrogen bond formation between two DNA fragments
   (C) It is used to synthesize complementary DNA strand on DNA template
   (D) All of these

4. Mitochondria are not found in :
   (A) Nerve cell
   (B) Sperm cell
   (C) Mature RBC
   (D) Mature WBC

5. Largest amount of phosphate bond energy is produced in the process of respiration during :
   (A) Glycolysis
   (B) Krebs Cycle
   (C) Anaerobic respiration
   (D) None of the above

6. Pernicious anemia is caused due to deficiency of :
   (A) Vitamin B_{12}
   (B) Vitamin B_1
   (C) Vitamin C
   (D) Iron

7. In C_3 plants first stable product of photosynthesis during dark reaction is :
   (A) Malic acid
   (B) Oxaloacetic acid
   (C) Phosphoglyceraldehyde
   (D) Phosphoglyceric acid

8. High concentration of synthetic auxins would :
   (A) Prevent lateral buds to grow
   (B) Kill weeds
   (C) Cause root
   (D) Control cell enlargement

9. When the cell is fully turgid, which of the following will be zero ?
   (A) Osmotic pressure
   (B) Turgor pressure
   (C) Wall pressure
   (D) Suction pressure

10. Which of the following is oilseed ?
   (A) *Glycine max*
   (B) *Arachis hypogea*
   (C) *Brassica spp.*
   (D) *All the three*

11. Which of the following vegetables are obtained from plant stems ?
   (A) Potato
   (B) Lotus
   (C) Carrot
   (D) Both (A) and (B)

12. Which of the following spices contains curcumin ?

(A) Turmeric

(B) Ginger

(C) Garlic

(D) Fennel

13. Which part of the human brain is more developed in comparison to others ?

(A) Cerebellum

(B) Cerebrum

(C) Medulla oblongata

(D) Optic lobes

14. In an accident there is a great loss of blood and there is no time to analyze the blood group of the man. Which blood group can be safely transfused ?

(A) AB Rh+

(B) AB Rh–

(C) O Rh–

(D) O Rh+

15. In humans, the urea is mainly produced in :

(A) Kidneys

(B) Gall bladder

(C) Spleen

(D) Liver

16. Acid rains are due to excessive atmospheric pollution due to :

(A) NO_2

(B) SO_2

(C) NH_3

(D) CO_2

17. Dimensional formula for torque is :

(A) L^2T^{-2}

(B) $M L^2 T^{-2}$

(C) ML^2T^{-1}

(D) ML^2T^2

18. Two water droplets merge with each other to form a larger droplet. In this process :

(A) Energy is liberated

(B) Energy is absorbed

(C) Energy is neither liberated nor absorbed

(D) Some mass is converted into energy

19. A piece of ice having a stone frozen in it floats in a glass vessel filled with water. How will the level of water in the vessel change when the ice melts ?

(A) the level will rise

(B) the level will not change

(C) the level will drop

(D) some water will flow out

20. The relation between frequency n, wavelength λ and velocity of propagation v of the wave is :

(A) $n = v\lambda$

(B) $n = \lambda/v$

(C) $n = 1/\lambda$

(D) $n = v/\lambda$

21. Which of the following metals can deposit copper from copper sulphate solution ?

(A) Mercury

(B) Iron

(C) Gold

(D) Platinum

22. If a chemical change is bought about by one or more method, in one or more steps, then the amount of heat absorbed or evolved during the complete change is the same, whichever method was followed. The rule is known as :

(A) Joule Thomson effect

(B) Le Chatelier principle

(C) Hess law

(D) None of these

23. A piece of glass is heated to a high temperature and then allowed to cool. If it cracks, a probable reason for this is the following property of glass :

(A) Low thermal conductivity

(B) High thermal conductivity

(C) High specific heat

(D) High melting point

24. Microwaves are the electromagnetic waves with frequency of :

(A) 300 MHz – 300 GHz

(B) 30 MHz – 300 MHz

(C) 50 MHz – 500 MHz

(D) 500 MHz – 500 GHz

25. Na+ is isoelectronic with :

(A) Li^+

(B) Mg^{2+}

(C) Ca^{2+}

(D) Ba^{2+}

26. Which of the following is soluble in water ?

(A) C_2H_5OH

(B) CS_2

(C) CH_3OH

(D) Both (A) and (C)

27. The osmotic pressure of solution increases if :

(A) Temperature is decreased

(B) Solution constant is increased

(C) Number of solute molecules is increased

(D) Volume is increased

28. Phenolphthalein acts as an indicator in the pH range of :

(A) 4.5-6.5

(B) 6.8-7.0

(C) 8.3-10.0

(D) None of the three

29. Why alcohols have higher boiling points than the hydrocarbons from which they are derived ?

(A) Due to higher molecular weight

(B) Due to the presence of hydroxyl groups

(C) Due to hydrogen bonding between molecules

(D) Due to polymerization of molecules

30. If formaldehyde and KOH are treated together, we get :

(A) Methane

(B) Acetylene

(C) Ethyl acetate

(D) Methanol

31. If 1, w, w^2 are the cube roots of unity, then $1+w+w^2=?$

(A) 0

(B) –1

(C) 2

(D) 3

32. For small values of θ, $\sin\theta = ?$

(A) 1

(B) θ

(C) 0

(D) None of these

33. If $x+y=k$ is normal to a parabola $y^2=12x$, then $k = ?$

(A) 3

(B) –9

(C) +9

(D) –3

34. For what value of k, $\int_1 (x/1+x^4)\,dx = k$:

(A) $\tan x^2 + c$

(B) $\tan^{-1}x^2 + c$

(C) $\frac{1}{2}\tan^{-1} x^2 + c$

(D) None of them

35. The degree and order of a differential equation $x^2d^3y/dx^3 + (d^2y/dx)^5 + 2y = e^{-x}$ are respectively given by :

(A) (2, 3)

(B) (1, 2)

(C) (3, 5)

(D) (1, 3)

36. The product AB of two matrices A & B is possible if :

(A) The number of columns in A is equal to the number of rows in B

(B) The number of rows in A is equal to the number of columns in B

(C) Both statements (A) & (B) are correct

(D) Neither (A) nor (B) is correct

37. A polynomial equation $x^3-1=0$ has :

(A) One real root

(B) One complex root

(C) All real roots

(D) None of these

38. Production of polished rice involves :

(A) Removal of husk

(B) Removal of husk and bran

(C) Coating of dehusked rice with edible polish

(D) None of the three

39. Which of the following grains are good sources of soluble fiber β- glucan ?

(A) Oat

(B) Barley

(C) Both (A) and (B)

(D) None

40. Role of salt in pickles is :

(A) controls the fermentation

(B) improves taste and flavour

(C) hardens the texture

(D) all the three

41. Equilibrium moisture content of food depends on :

(A) relative humidity

(B) air temperature

(C) nature of food

(D) all the three

42. Protein content of red meat is around :

(A) 15 g/100g

(B) 20 g/100g

(C) 30 g/100g

(D) 32 g/100g

43. Freezer burn of meat is due to :

(A) Over roasting of meat

(B) Rupture of cells due to large ice crystal formation

(C) Drying of the surface of frozen meat in freezer

(D) All the three

44. On an average cholesterol content of an egg is :

(A) 50 mg

(B) 100 mg

(C) 150 mg

(D) 200 mg

45. Moisture content of Ghee as per FSSAI standards should not be more than :

(A) 0.5%

(B) 1%

(C) 1.5%

(D) 2%

46. Specific gravity of cow milk increases on :

(A) Addition of skim milk powder

(B) Removal of cream

(C) Addition of sugar

(D) All the three

47. Which of the following bacterial species is known for its high rate of biomass production?

(A) *Methylophilus methylotrophus*

(B) *Xanthomonas*

(C) *Clostridium*

(D) *Rhizomonas*

48. Which of the following microbe is used in the production of blue cheese?

(A) *Streptococcus thermophilus*

(B) *Lactobacillus bulgaricus*

(C) *Penicillium roqueforti*

(D) *Rhizopus stolonifera*

49. Bacterial cell grown on hydrocarbon wastes from the petroleum industry are a source of :

(A) carbohydrates

(B) proteins

(C) vitamins

(D) fats

50. Fungi are :

(A) prokaryotic

(B) eukaryotic

(C) prokaryotic and lack chlorophyll

(D) eukaryotic and lack chlorophyll

51. Find the mode of the data: 11,13,13,17,19,23,25 :

(A) 11

(B) 13

(C) 17

(D) 23

52. Variability of population is checked by :

(A) Mean

(B) Mode

(C) Median

(D) Standard Deviation

53. If the values of two variables move in the opposite direction :

(A) The correlation is said to be linear

(B) The correlation is said to be non-linear

(C) The correlation is said to be positive

(D) The correlation is said to be negative

54. What is the meaning of the testing of the hypothesis ?

(A) It is a significant estimation of the problem

(B) It is a rule for acceptance or rejection of the hypothesis of the research problem

(C) It is a method of making a significant statement

(D) None of the above

55. Which of the following is a carotenoid ?

(A) Lycopene

(B) β carotene

(C) Lutein

(D) All the three

56. Which of the following is exopeptidase ?

(A) Pepsin

(B) Trypsin

(C) Chymotrypsin

(D) Carboxypeptidases

57. Potatoes, cereals, beans, pulses and oats are rich in ?

(A) Protein

(B) Vitamins

(C) Carbohydrates

(D) Minerals

58. Which of the following has emulsifying properties ?

(A) Phospholipids

(B) Monoglycerides

(C) Diglycerides

(D) All the three

59. Fish spoils faster due to :

(A) High pH of the muscles postmortem

(B) Highly unsaturated body fat

(C) Autolysis of muscles

(D) All the above

60. Which of the following aims at food safety ?

(A) HACCP

(B) GMP

(C) GAP

(D) All the three

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1. Electron carriers for oxidative phosphorylation are present in

(A) Outer mitochondrial membrane

(B) Mitochondrial intermembrane space

(C) Inner mitochondrial membrane

(D) Mitochondrial matrix

2. The DNA sequence that enables complete replication of linear chromosome is

(A) Origin of replication

(B) Kinetochore

(C) Centromere

(D) Telomere

3. Taq DNA polymerase is used in PCR due to its

(A) Polymerase activity

(B) Proofreading activity

(C) High fidelity

(D) Thermal stability

4. Enzymes that lead to formation of double bond are known as

(A) Transferase

(B) Hydrolase

(C) Lyase

(D) Isomerase

5. Cofactors that are tightly bound to the enzymes are called

(A) Cosubstrates

(B) Coenzyme

(C) Apoenzme

(D) Prosthetic group

6. Action of penicillin on bacterial cell wall enzyme transpeptidase is an example of

(A) Irreversible inhibition

(B) Competitive inhibition

(C) Non-competitve inhibition

(D) Uncompetitive inhibition

7. Electron donor in the light reaction of photosynthesis is

(A) NADH

(B) NADPH

(C) Oxygen

(D) Water

8. Which plant hormone is used to destroy weeds in field?

(A) Indole butyric acid

(B) Indole acetic acid

(C) Naphthalene acetic acid

(D) 2, 4-dichlorophenoxy acetic acid

9. Which of the following micro-organism cannot fix atmospheric nitrogen?

(A) Escherichia coli

(B) Rhizobium

(C) Azotobacter

(D) Cyanobacteria

10. Which of the following microbe is used in the production of blue cheese?

(A) Streptococcus thermophilus

(B) Lactobacillus bulgaricus

(C) Penicillium roqueforti

(D) Rhizopus stolonifera

11. The complete destruction or elimination of all viable organisms in or on a substance is known as
    (A) Sterilization
    (B) Antisepsis
    (C) Disinfection
    (D) Sanitization
12. Micro-organisms with optimum growth temperature of 37 °C are called
    (A) Psychrophiles
    (B) Psychrotrophs
    (C) Mesophiles
    (D) Thermophiles
13. Which organ synthesizes mixture of digestive enzyme?
    (A) Stomach
    (B) Pancreas
    (C) Small intestine
    (D) Large intestine
14. Bile salts are synthesized by
    (A) Stomach
    (B) Pancreas
    (C) Liver
    (D) Gall bladder
15. Molecules of carbon are held together by which of the following bonds in Graphite?
    (A) Ionic bond
    (B) Hydrogen bond
    (C) Covalent bond
    (D) Van der Waals bond
16. What is the right way to mix water and acid?
    (A) Slowly add water into acid while stirring the solution
    (B) Slowly add acid into the water while stirring the solution
    (C) Add acid into water and shake the solution
    (D) None of these
17. A difference between strong and weak acid is
    (A) proton donation and electron acceptance
    (B) complete and partial ionization
    (C) negative and positive pH
    (D) presence and absence of halogen ions
18. Which one of the following is classified as polyester polymer?
    (A) Nylon-66
    (B) Bakelite
    (C) Terylene
    (D) Melamine
19. Which one of the following is not a polymer?
    (A) Sucrose
    (B) Enzyme
    (C) Starch
    (D) Teflon
20. Which of the following reagents causes alcohol substitution?
    (A) PBr_3
    (B) SOC12
    (C) CH_3SO_2C1
    (D) All of the above
21. Which of the following types of reactions corresponds to the transformation of an alcohol into a ketone?
    (A) Substitution
    (B) Elimination
    (C) Oxidation
    (D) Deprotonation
22. Ozone is formed by _____ dissociation of molecular oxygen into individual oxygen atoms.
    (A) Photochemical
    (B) Thermochemical
    (C) Thermal
    (D) Ionic

23. What is the unit of force?

(A) $(kg * m^2) / s$

(B) $(kg * m) / s^2$

(C) $kg / (m^2 * s)$

(D) $kg / (m^2 * s^2)$

24. The degree of the equation $\left(\frac{d^3y}{dx^3}\right)^{\frac{2}{3}} + \left(\frac{d^3y}{dx^3}\right)^{\frac{3}{2}} = 0$ is

(A) $\frac{3}{2}$

(B) 5

(C) 4

(D) 9

25. Which of the following is the shear thinning fluid?

(A) Pseudo plastic

(B) Dilatant

(C) Rheopectic

(D) Bingham plastic

26. In which of the following conditions Bernoulli equation can't be used?

(A) Steady flow

(B) Incompressible fluid

(C) Viscous flow

(D) Laminar flow

27. Sound waves of frequency less than 20 Hz is known as

(A) Ultrasonic

(B) Audible

(C) Infrasonic

(D) Supersonic

28. The relation between shear stress τ and velocity gradient of a fluid is given by, if $n > 1$, what type of fluid will it be?

(A) Newtonian fluid

(B) Dilatant

(C) Pseudo plastic

(D) Bingham plastic

29. The appropriate rate equation for convective heat transfer between a surface and adjacent fluid is prescribed by which law?

(A) Kirchhoff's law

(B) Newton's first law

(C) Wein's displacement law

(D) Newton's law of cooling

30. As the temperature increases, the thermal conductivity of a gas

(A) Increases

(B) Decreases

(C) Remains constant

(D) Increases up to a certain temperature and then decreases

31. The enthalpy of the system is given by H = Enthalpy, E = Internal energy, P = Pressure, V = Volume

(A) $H = E - PV^2$

(B) $H = E - PV$

(C) $H = E + PV$

(D) $H = E - P^2V$

32. $\lim_{x \to 0} \frac{(1+x)^{\frac{1}{x}} - e}{x}$

(A) e

(B) $-e$

(C) $-2e$

(D) $\frac{-e}{2}$

33. If $z = x + iy$, then the number of solutions of the equation $z^2 = \bar{z}$ is

(A) one

(B) two

(C) four

(D) infinite

34. The real part of complex number $(1 + i)^n$ is

(A) $2^{\frac{n}{2}} \cos \frac{np}{4}$

(B) $2^n \cos \frac{np}{2}$

(C) $2^{\frac{-n}{2}} \cos np$

(D) $2^{-n} \cos \frac{np}{2}$

35. The correct polar form of the complex number $(1 - i)$ is

(A) $\sqrt{2}e^{\frac{p}{4}i}$

(B) $e^{\frac{p}{4}i}$

(C) $\sqrt{2}e^{-\frac{p}{4}i}$

(D) $e^{-\frac{p}{4}i}$

36. The integrating factor of $x\frac{dy}{dx} + (3x + 1)y = xe^{-2x}$ is

(A) xe^{3x}

(B) $3xe^{x}$

(C) xe^{x}

(D) x^3e^{3x}

37. Let A be a matrix of order $m \times n$ and B be a matrix of order $n \times p$, $n > p$. If rank(A) = n and rank (B) = p then the rank (AB) is

(A) n

(B) p

(C) np

(D) n + p

38. Which hydrocolloid shows milk reactivity?

(A) Gum arabic

(B) Tragacanth

(C) Carrageenan

(D) Guar gum

39. The preservative having maximum efficacy against *Clostridium botulinum* is

(A) Sodium benzoate

(B) Parabens

(C) Nitrites

(D) Sulphur-dioxide

40. Preservative having maximum efficiency against rope forming organisms in bread is:

(A) Sodium benzoate

(B) Sulphur dioxide

(C) Nitrites

(D) Calcium propionate

41. The preservative having activity both in acidic as well as alkaline pH is:

(A) Sodium benzoate

(B) Sorbic acid

(C) Parabens

(D) Propionic acid

42. An acidulant that is not a sequesterant is

(A) Acetic acid

(B) Citric acid

(C) Phosphoric acid

(D) Tartaric acid

43. Among the following fatty acids, which group is known as essential fatty acids?

(A) 9,11-Octadecadienoic and 9,11,13-Octadecatrienoic

(B) 9,12-Octadecadienoic and 9,12,15-Octadecatrienoic

(C) 9-Octadecenoic and 9,11-Octadecadienoic

(D) 9,11-Octadecadienoic and 9-Eicosenoic

44. The iodine number of a fat measures

(A) its amphipathic character.

(B) the number of phosphate groups in the molecule.

(C) its degree of unsaturation.

(D) the number of hydroxyl groups present.

45. Kawashiorkor disease is caused due to the deficiency of

(A) Lysine

(B) Essential fatty acids

(C) Vitamin K

(D) Protein

46. The primary bacterial spoilage of poultry meat at low temperature, with characteristic sliminess at outer surface, is caused by

(A) *Pseudomonas spp.*

(B) *Aspergillus spp.*

(C) *Bacillus spp.*

(D) *Candida spp.*

47. The weight gains (in gram) per gram protein consumed is called

(A) Net Protein Ratio (NPR)

(B) Biological Value (BV)

(C) Protein Efficiency Ratio (PER)

(D) Chemical Score (CS)

48. The brown colour of bread crust during baking is due to Maillard reaction between

(A) aldehyde groups of sugars and amino groups of proteins

(B) aldehyde groups of sugars and vitamins

(C) aldehyde groups of sugars and salt

(D) starch and yeast

49. Reassociation of amylose and formation of crystalline structure upon cooling of cooked starch solution is termed as

(A) Synersis

(B) Gelatinization

(C) Retrogradation

(D) Denaturation

50. The basal metabolic rate (BMR) is the energy needed by a resting individual. The factors with the least effect on the BMR is the

(A) sex of the individual

(B) age of the subject

(C) body composition of the individual

(D) mental activity of the subject

51. Which of the following is the definition of Km (the Michaelis constant)?

(A) The half maximal velocity.

(B) The velocity when substrate and product are at 1 molal concentrations.

(C) The concentration of substrate required to give half maximal velocity

(D) The velocity at saturating concentrations of substrate

52. Fat bloom is a defect occurring in chocolate products due to improper

(A) refining

(B) tempering

(C) conching

(D) packaging

53. The term HACCP stands for

(A) Hygiene Associated Critical Control Point

(B) Hazard Analysis and Critical Commercial Point

(C) Hygienic and Aesthetic Concept of Critical Products

(D) Hazard Analysis and Critical Control Point

54. Gluten in wheat flour dough is made up of gliadin and

(A) Albumin

(B) Globulin

(C) Prolamin

(D) Glutenin

55. The key enzyme involved in enzymatic browning of fruits or vegetables is

(A) Peroxidase

(B) Polyphenol oxidase

(C) Catalase

(D) Cholesterol Oxidase

56. Which microorganism is used as indicator in water analysis?

(A) *S. typhi*

(B) *E. coli*

(C) *K. pneumoniae*

(D) *P. aeruginosa*

57. Which one of the following minerals regulates the acid - base balance of the body ?

(A) Ca

(B) Na

(C) K

(D) Fe

58. Enzyme involved in conversion of sugar into glucose and fructose is

(A) maltase

(B) zymase

(C) invertase

(D) diastase

59. Fruit juices are deaerated before pasteurization processing, in order to

(A) Reduce fouling of pasteurizer

(B) Decrease the rate of heat transfer

(C) Reduce oxidation reaction

(D) All of the above

60. Which of the following enzyme is used for tenderization of meat?

(A) Renin

(B) Papain

(C) Trypsin

(D) Lipase

ROUGH WORK

Sr. No. 096

ENTRANCE TEST-2020

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Total Questions : 60
Time Allowed : 70 Minutes

Roll No. : | | | | | | |

Instructions for Candidates :

1. Write your Entrance Test 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 the 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 Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. 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.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be **'Negative Marking'** for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer Sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/herself.
14. 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.

1. The process of preserving food by rapid freezing followed by dehydration under vacuum is called :
   (A) Lyophilisation
   (B) Sterilisation
   (C) Cold dehydration
   (D) Cryopreservation

2. Which one of the following statements is true ?
   (A) All bacteria are harmful.
   (B) Some bacteria are harmful
   (C) No bacteria are harmful
   (D) Only bacterial spores are harmful

3. What is the correct operating temperature for a refrigerator ?
   (A) 1°C to 4°C
   (B) 5°C to 63°C
   (C) – 18°C
   (D) 100°C

4. In comparison to raw rice bran, parboiled rice bran contains :
   (A) Less starch and more oil
   (B) More starch and less oil
   (C) More starch and more oil
   (D) Less starch and less oil

5. The following technique/method can be used to estimate protein content in milk :
   (A) Phenol – Sulfuric Acid
   (B) Kjeldahl
   (C) NMR
   (D) Diphenylamine

6. Principal protein in bovine milk is :
   (A) Albumin
   (B) Lactalbumin
   (C) Casein
   (D) Lactoglobulin

7. All the following are sulphur containing amino acids found in proteins except :
   (A) Cysteine
   (B) Cystine
   (C) Methionine
   (D) Threonine

8. The general formula of polysaccharides is :
   (A) $(C_6H_{10}O_5)_n$
   (B) $(C_6H_{12}O_5)_n$
   (C) $(C_6H_{10}O_6)_n$
   (D) $(C_6H_{10}O_5)_4$

9. In humans the conversion of carotenoids to Vitamin A takes place predominantly in :
   (A) Intestine
   (B) Kidney
   (C) Liver
   (D) Skin

10. Kwashiorkor occurs when the diet is severely deficient in :
   (A) Iron
   (B) Calories
   (C) Proteins
   (D) Essential fatty acids

11. The high nutritive value of cheese is due to :
   (A) High mineral contents
   (B) High protein contents
   (C) Taste and flavor
   (D) All of the above

12. The application of any effective method or substance to a clean surface for destruction of pathogen is called :
   (A) Pasteurisation
   (B) High Temperature Treatment
   (C) Sanitization
   (D) Cleaning

13. Energy value of a food is measured in terms of :
(A) Carbohydrates
(B) Fats
(C) Proteins
(D) Calories

14. Destruction of which enzyme is used as an index of super-HTST pasteurization ?
(A) Catalase
(B) Lipase
(C) Lactoperoxidase
(D) All of the above

15. If all the observations are multiplied by 3, then :
(A) New SD would be also multiplied by 3
(B) New SD would be one-half of the previous SD
(C) New SD would be increased by 3
(D) New SD would be decreased by 3

16. The coefficient of variation (CV) for a sample, with mean = 100 and SD = 10, is _____ .
(A) 0.1 %
(B) 10 %
(C) 100 %
(D) 200 %

17. Thirty people were admitted in a hospital for the treatment of a particular illness : 14 were admitted for 1 day ; 10 for 2 days, and 6 for 3 days. What is the mode for days admitted in hospital :
(A) 1
(B) 2
(C) 3
(D) 14

18. What type of data do you need for a chi-square test ?
(A) Categorical
(B) Scales
(C) Ordinal
(D) Parametric

19. In batch fermentation, this can occur during the final growth phases while product concentrations are high :
(A) Product inhibition
(B) Intermediate inhibition
(C) Substrate inhibition
(D) None of the above

20. In this phase, the net specific growth rate is same, measured by either cell number or cell mass :
(A) Lap
(B) Lag
(C) Exponential
(D) All of the above

21. With respect to their surrounding membrane system, which is the odd one out ?
(A) Nucleus
(B) Endoplasmic reticulum
(C) Mitochondria
(D) Chloroplasts

22. Which of the following cells does not belong to the myeloid lineage ?
(A) Macrophages
(B) Neutrophils
(C) Mast cells
(D) NK cells

23. Which of the following is responsible for secondary immune responses ?
(A) Mediated by naive lymphocytes
(B) Mediated by memory lymphocytes
(C) Mediated by effector lymphocytes
(D) Mediated by antibodies

24. A recombinant DNA molecule is produced by joining together :
(A) One mRNA with a DNA segment
(B) One mRNA with a tRNA segment
(C) Two mRNA molecules
(D) Two DNA segments

25. Conversion of excess glucose to glycogen is known as :
(A) Galactogenesis
(B) Glycolysis
(C) Glycogenesis
(D) Glycogenolysis

26. Rickets may arise in children that do not receive sufficient :
(A) Vitamin A
(B) B group vitamins
(C) Vitamin C
(D) Vitamin D

27. Which of the following is/are cytokinin(s) :
(A) Benzylaminopurine
(B) Indole-3-butyric acid
(C) Indole-3-acetic acid
(D) All of the above

28. Kashmiri (local) name for Artemisia absinthium is :
(A) Kah Zaban
(B) Tethwan
(C) Sozposh
(D) Zakhmi hayat

29. In margarine manufacture, hydrogen is added to unsaturated fats to saturate them and produce a more solid product. This is an example of :
(A) Hydrolysis
(B) Carbonation
(C) Hydrogenation
(D) Rancidity

30. _____ transport is a naturally occurring phenomenon and does not require the cell to expend energy to accomplish the movement.
(A) Active
(B) Passive
(C) Hyper
(D) All of the above

31. Thinking about photosynthesis and respiration in plants, which statement is correct ?
(A) Photosynthesis is the opposite of respiration
(B) Photosynthesis and respiration both occur in plants
(C) Only photosynthesis occurs in plants
(D) Respiration for maintenance and growth only occurs in the dark

32. Which spice is a great natural remedy for nausea and motion sickness ?
(A) Ginger
(B) Black pepper
(C) Mustard seed
(D) Cumin

33. Oxyhaemoglobin dissociates into oxygen and haemoglobin at :
(A) Low oxygen pressure in tissues
(B) High oxygen pressure in tissues
(C) High Carbon dioxide level
(D) Never dissociates

34. Which of the following represents bile salts ?
(A) Bilirubin and biliverdin
(B) Haemoglobin and biliverdin
(C) Sodium glycocholate and taurocholate
(D) Bilirubin and haemoglobin

35. Curdling of milk in stomach occurs due to :
(A) Rennin
(B) Renin
(C) Trypsin
(D) Chymotrypsin

36. Green house gases include :
(A) CO_2, CFC, CH_4, N_2O
(B) CO_2, N_2, NO_2, O_2, NH_3
(C) CH_4, N_2, CO_2, NH_3
(D) CFC, CO_2, NH_3, N_2

37. The dimensions for "density" are :
(A) $L T^{-2}$
(B) ML^{-3}
(C) MLT^{-2}
(D) $ML^{-1}T^{-2}$

38. Fundamental equation that relates pressure to fluid's speed and height is known as :
(A) Equation of continuity
(B) Bernoulli's equation
(C) Light equation
(D) Speed equation

39. Light year is a unit of :
(A) Time
(B) Light
(C) Distance
(D) Intensity of light

40. The magnitude of the buoyant force equals the weight of the object for :
(A) An object that sinks
(B) Any object submerged partially or completely in a fluid
(C) An object that floats
(D) No object submerged to any extent in a fluid

41. A temperature change of 1.0 °C is equivalent to what temperature change in Fahrenheit ?
(A) 1.0 °F
(B) 1.8 °F
(C) 32 °F
(D) 212 °F

42. When a mass 'm' of ice melts and becomes liquid water :
(A) The ice absorbs latent heat
(B) The ice gives out latent heat
(C) The ice does not exchange any heat
(D) None of the above

43. Which atomic orbital is spherical in shape ?
(A) 2s
(B) 3p
(C) 3d
(D) 4f

44. Which one of the following thermodynamic quantities is not a state function ?
(A) Gibbs free energy
(B) Enthalpy
(C) Entropy
(D) Work

45. A positron has a mass number of _____, a charge of _____, and a mass equal to that of a(an) _____ .
(A) 0, 1+, proton
(B) 1, 2+, proton
(C) 0, 1+, electron
(D) 1, 2+, electron

46. Calculate the distance between two charges of 4C forming a dipole, with a dipole moment of 6 units.
(A) 1
(B) 1.5
(C) 2
(D) 2.5

47. For a nucleus with nuclear spin quantum number I = ½, what are the values of mI ?
(A) +½, + 1
(B) +½, – ½
(C) 0, + 1
(D) +½, 0

48. Which element has the ground state electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^5$?
(A) Si
(B) P
(C) S
(D) Cl

49. Which of the following compounds contains a planar C_x ring ?

(A) Cyclopentane

(B) Cyclobutane

(C) Cyclopropane

(D) Cyclohexane

50. Which statement is incorrect about ethanol (EtOH) ?

(A) Hydrogen bonding occurs between EtOH molecules in neat EtOH

(B) The OH group in EtOH is hydrophobic

(C) Ethanol is miscible with water

(D) Hydrogen bonding occurs between EtOH and H_2O molecules in aqueous EtOH

51. Which expression represents the following sum :

$$\frac{1}{4^2}+\frac{1}{5^2}+\frac{1}{6^2}+\frac{1}{7^2}$$

(A) $\sum_{i=1}^{7} \frac{1}{i^2}$

(B) $\sum_{i=1}^{4} \frac{1}{i^2}$

(C) $\sum_{i=4}^{7} \frac{1}{i^2}$

(D) $\sum_{i=1}^{7} \frac{1}{i}$

52. Rearrange the following expression to make y the subject : $\ln(4y^3) = 2$

(A) $y = \sqrt[3]{\frac{e^2}{4}}$

(B) $y = e^{\frac{1}{4}}$

(C) $y = \frac{e^2}{4}$

(D) $y = \sqrt[3]{\frac{1}{2\ln}}$

53. Multiplication of the complex numbers, $(7-5i)(6+4i)$, gives :

(A) $62+2i$

(B) $21-2i$

(C) $21+2i$

(D) $62-2i$

54. Differentiating $y = \frac{1}{3}x^6$ with respect to x, gives :

(A) $2x^5$

(B) $\frac{1}{3}x^6(5x)$

(C) $\frac{1}{3}x^5$

(D) $\frac{1}{6}x^5$

55. The correct solution for the integral, $\int \frac{dx}{x^3}$:

(A) $\frac{1}{2x^2}+C$

(B) $\frac{-1}{2x^2}+C$

(C) $\frac{3}{2x^2}+C$

(D) $\frac{-3}{2x^3}+C$

56. $(x^3-5x^2-2x+24)$ divided by $(x-3)$ gives :

(A) $-x^2+2x+8$

(B) $-x^2-2x-8$

(C) x^2-2x-8

(D) x^2+2x+8

57. The rank of the matrix $\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 1 \\ 0 & 0 & 0 \end{bmatrix}$ is :

(A) 0

(B) 1

(C) 2

(D) 3

58. If $f(x) = x^2 - 3x - 4$, what is $f(a^2 + 1)$ equal to :

(A) $a^2 - 3a - 3$

(B) $a^4 - 3a^2 - 3$

(C) $a^4 - a^2 - 6$

(D) $a^4 - 3a - 3$

59. The dichromate ion absorbs light of wavelength close to 500 nm. Based on this information, what can you conclude ?

(A) The dichromate ion absorbs outside the visible region

(B) Solutions of the dichromate ion are colourless

(C) The dichromate ion absorbs in the ultraviolet region

(D) The dichromate ion absorbs within the visible region

60. For a reaction $2A + B \rightarrow 2C$, with the rate equation : Rate $= k[A]^2[B]$:

(A) The order with respect to A is 1 and the overall order is 1

(B) The order with respect to A is 2 and the overall order is 2

(C) The order with respect to A is 2 and the overall order is 3

(D) The order with respect to B is 2 and the overall order is 2

1. The correct combination of terms with reference to an animal cell is :
   (A) Cell wall, cell membrane, nucleus, plastid
   (B) Cell wall, nucleus, ribosome, chromosome
   (C) Cell membrane, mitochondria, ribosome, chromosome
   (D) Cell membrane, ribosome, mitochondria, chloroplast

2. The phase of a cell cycle with a period of intense synthesis and growth constituting about 90% of cell cycle is :
   (A) Telophase
   (B) Interphase
   (C) Prophase
   (D) Anaphase

3. Okazaki fragments are synthesized on :
   (A) Leading strand during replication
   (B) Lagging strand during replication
   (C) Silent strand during transcription
   (D) Introns during transcription

4. The term enzyme was coined by :
   (A) Louis Pasteur
   (B) J.J. Berzellius
   (C) Wilhelm Friedrich Kühne
   (D) J.P. Northrop

5. Tick odd one out with respect to peculiar functions of amino acids :
   (A) Tryptophan
   (B) Tyrosine
   (C) Phenylalanine
   (D) Methionine

6. Breakdown of a proton gradient developed during chemiosmosis leads to the release of :
   (A) Oxygen
   (B) Water
   (C) Energy
   (D) Protons

7. Which of the following is not the limiting factor in normal conditions of photosynthesis ?
   (A) Water
   (B) Light
   (C) Chlorophyll
   (D) Carbon dioxide

8. ABA is involved in the :
   (A) Dormancy of seeds
   (B) Root elongation
   (C) Shoot elongation
   (D) Increased cell division

9. Coenzymes are usually vitamin derivatives involved in :
   (A) Oxidation and reduction reactions
   (B) Group transfers
   (C) Both (A) and (B) are correct
   (D) Neither (A) nor (B) is correct

10. Medicinal plants have their therapeutic action because of :
   (A) Saponins
   (B) Alkaloids
   (C) Essential oils
   (D) All the above

11. Molecules of natural poly unsaturated fatty acids in vegetable oils contain :
   (A) 18 carbon atoms with one carbon-carbon double bond in cis configuration
   (B) 18 carbon atoms with at least two carbon-carbon double bonds in cis configuration
   (C) 18 carbon atoms with one carbon-carbon double bond in trans configuration
   (D) 20 carbon atoms with at least two carbon-carbon double bonds in cis configuration

12. Ginger and turmeric are spices made from :
   (A) The inner bark of trees
   (B) Rhizomes
   (C) Dried flower buds
   (D) Fermented and dried berries

13. B.O.D. and C.O.D. are two important parameters for establishing water pollution and for polluted water :
(A) B.O.D. is always less than C.O.D.
(B) B.O.D. is always greater than C.O.D.
(C) B.O.D. is always equal to C.O.D.
(D) B.O.D. of water cannot be predicted

14. Buffering capacity of blood is contributed by :
(A) Hemoglobin
(B) Albumin
(C) Insulin
(D) Oxygen

15. If the pH of stomach is 1.6, then which enzyme will digest proteins ?
(A) Trypsin
(B) Pepsin
(C) Amylase
(D) Chymotrypsin

16. The hormone/s controlling blood glucose level can be :
(A) Insulin only
(B) Glucagon only
(C) Both Insulin and Glucagon
(D) Neither Insulin nor Glucagon

17. The dimensional formula of Energy can be :
(A) $M^1L^2T^{-2}$
(B) $M^1L^2T^{-3}$
(C) $M^1L^1T^{-2}$
(D) $M^2L^2T^{-2}$

18. If length of wire is 1 m and cross-sectional area 5×10^{-5} m^2, when wire is stretched through 1 mm by a force of 10,000 N, Young's modulus of wire would be :
(A) 2×10^5 Nm^{-2}
(B) 2×10^9 Nm^{-2}
(C) 2×10^8 Nm^{-2}
(D) 2×10^{11} Nm^{-2}

19. According to Bernoulli's equation, where speed is high, pressure will be :
(A) High
(B) Low
(C) Minimum
(D) Maximum

20. What is the principle for measurement of the velocity of ultrasonic waves ?
(A) Magnetostriction effect
(B) Acoustical grating
(C) Doppler effect
(D) Acceleration effect

21. Entropy change depends on :
(A) Heat transfer
(B) Mass transfer
(C) Change of temperature
(D) Thermodynamic state

22. Given that :

$$C + O_2 \rightarrow CO_2 \quad ; \quad \Delta H^\circ = -x \text{ kJ}$$
$$2CO + O_2 \rightarrow 2CO_2 \; ; \quad \Delta H^\circ = -y \text{ kJ}$$

The enthalpy of formation of carbon monoxide will be :
(A) $(y-2x)/2$
(B) $(y-2x)$
(C) $(2x-y)$
(D) $(x-y)/2$

23. One of the best solvents for ionic compounds in accordance of their dielectric constants (D) at 25°C is :
(A) Solvent with, D = 78.5
(B) Solvent with, D = 32.6
(C) Solvent with, D = 24.3
(D) Solvent with, D = 20.7

24. What is true about MRI ?
(A) MRI does not involve X-rays or the use of ionizing radiation, which distinguishes it from CT or CAT scans and PET scans
(B) Magnetic resonance imaging is a medical application of nuclear magnetic resonance (NMR)
(C) MRI was originally called NMRI (nuclear magnetic resonance imaging)
(D) All of the above

25. The observed dipole moment of nitromethane is higher than the dipole moment calculated from its structural descriptions. It is because of :
(A) Hyperconjugation
(B) Resonance
(C) Inductive effect
(D) None of the above

26. In case of DNA structure, base is connected to deoxy ribose sugar through :
(A) Two hydrogen bonds
(B) A covalent bond
(C) Three hydrogen bonds
(D) None of the above

27. The maximum uncertainty in the velocity of a bullet weighing 10 g and whose position is known with 1×10^{-5} m accuracy is :
(A) 4.3×10^{-27} ms^{-1}
(B) 4.3×10^{-28} ms^{-1}
(C) 5.27×10^{-28} ms^{-1}
(D) 5.27×10^{-27} ms^{-1}

28. An isotope having too high neutron/proton ratio can gain stability by :
(A) β-emission
(B) γ-emission
(C) Proton emission
(D) K-capture

29. The acidic character of phenol can be explained mainly through :
(A) Resonance effect
(B) Inductive effect
(C) Hyper conjugation
(D) All of the above

30. Which among the following correctly defines Diastereomers ?
(A) These have same magnitude but different signs of optical rotation
(B) Nonsuperimposable object mirror relationship
(C) These differ in all physical properties
(D) Separation is very difficult

31. Deviation from Beer-Lambert's law results in case of :
(A) Highly concentrated solutions
(B) Association of analyte
(C) Dissociation of analyte
(D) All of the above

32. Which of the following dyes is/are synthetic ?
(A) Fast green
(B) Orange G
(C) Basic fuchsine
(D) All of the above

33. If $f(x) = [x \sin p x]$ {where [x] denotes greatest integer function}, then f(x) is :
(A) Continuous at $x = 0$
(B) Continuous in $(-1, 0)$
(C) Differentiable at $x = 1$
(D) Differentiable in $(-1, 1)$

34. The solution of the integral $y = \int_1^{e^3} \frac{5}{x} dx$ will be :
(A) $y = 15$
(B) $y = 51n3$
(C) $y = 15e^{-3} - 5$
(D) $y = 15e^{-3} - 3$

35. If two normal at P and Q of a parabola $y^2 = 4ax$ intersect at a third point R on the curve, then the product of ordinates of P and Q is :
(A) $4a^2$
(B) $8a^2$
(C) $2a^2$
(D) None of these

36. The slope of the normal to the curve
$x^2 + x^3 + 3xy + y^2 + 5 = 0$
at (1, 1) is :
(A) 5/8
(B) –5/8
(C) 8/5
(D) –8/5

37. Degree of a polynomial represented in x is the :
(A) Largest coefficients of x
(B) Smallest coefficient of x
(C) Lowest power of x
(D) Highest power of x

38. If $b^2 - 4ac < 0$, then roots of $ax^2 + bx + c = 0$ are :
(A) Equal
(B) Irrational
(C) Rational
(D) Imaginary

39. If determinant of a matrix is equal to zero, then it is said to be :
(A) Square matrix
(B) Singular matrix
(C) Non-singular matrix
(D) Identical matrix

40. Matrix A when multiplied with Matrix C gives the identity matrix I, then C will be :
(A) Identity matrix
(B) Inverse of A
(C) Square of A
(D) Transpose of A

41. What is the purpose for blanching (immersing food in hot water) vegetable during canning ?
(A) To soften the products to fill better
(B) To denature enzymes that change color, texture
(C) To reduce microbial population
(D) All of the above

42. Sodium benzoate is added for preservation of most of acidic fruit juices usually in the concentration of :
(A) 0.06-0.10%
(B) 0.3-0.5%
(C) 0.006-0.01%
(D) 0.5-1.0%

43. Which of the following is NOT a step in the process involved in dry milling of maize ?
(A) Degermination
(B) Sifting
(C) Removal of moisture
(D) Diluting

44. What is baking soda used for in baked goods ?
(A) To make dough sweeter
(B) To make the dough bake faster
(C) Used as a leavening agent in baked goods
(D) To make the dough look more edible

45. Milk fermentation to produce cheese initially is done by inoculating :
(A) *Streptococcus lactis* and Lactobacillus species
(B) *Saccharomyces cervisiae*
(C) Acetobacter and Glunobacter
(D) *Lactobacillus bulgaricus* and *Streptococcus thermophilus*

46. Below given are two statements about the storage of meat at low temperature :
1. A lot of changes take place in meat on storing at chilled temperature. These change muscle to meat.
2. The above process is called ageing or conditioning.
(A) Only 1 statement is true
(B) Both statements are true
(C) Only 2 statement is true
(D) Both statements are false

47. Which of the following has highest SDA value ?
(A) Corn oil
(B) Potato
(C) Egg
(D) Mango

48. According to BIS specifications total milk solid percentage in condensed milk is :
(A) 27
(B) 29
(C) 31
(D) 35

49. The maximum buffering capacity of a buffer is :
(A) 1 pH unit below its pK
(B) 1 pH unit above its pK
(C) Near its pK
(D) pK has no concern with the buffering capacity of a buffer

50. Inulin is a :
(A) Polysaccharide
(B) Trisaccharide
(C) Hormone
(D) None of the above

51. Myoglobin, when combined with oxygen, as in a freshly-cut piece of red meat, will be :
(A) Pink
(B) Brown
(C) Bright red
(D) Dark red

52. Pineapples contain protein-digesting enzymes called _____, which is known for its powerful ability to break down protein chains.
(A) Papain
(B) Bromelain
(C) Lipase
(D) Amylase

53. Fungi usually store the reserved food material in the form of :
(A) Proteins
(B) Starch
(C) Glycogen
(D) Lipids

54. Consider the following facts about the single cell proteins :
1. Single cell proteins refers to the source of proteins which are extracted from single cell organisms like algae, yeast, bacteria, and fungi normally grown on agricultural waste.
2. Microorganisms have an ability to upgrade low protein content and this phenomenon was employed during First World War by Germans.

Choose the correct answer/s from the codes given below :
(A) 1 only
(B) 2 only
(C) Both 1 and 2
(D) Neither 1 nor 2

55. If the doubling time of a bacterium is 30 min, starting with two bacteria initially, the number of bacteria produced in 3 hours will be :
(A) 16
(B) 32
(C) 64
(D) 128

56. Which is not an advantage of the fermented food ?
(A) Makes the food more digestible
(B) Increase storage life
(C) Synthesize vitamins
(D) Decrease intestinal microflora

57. If the value of any regression coefficient is zero, then two variables are :
(A) Qualitative
(B) Correlated
(C) Independent
(D) Dependent

58. The term regression was used by :
(A) Newton
(B) Pearson
(C) Spearman
(D) Galton

59. If arithmetic mean is multiplied to coefficient of variation then resulting value is classified as :
(A) Coefficient of deviation
(B) Coefficient of mean
(C) Standard deviation
(D) Variance

60. If mean is 11 and median is 13, then value of mode is :
(A) 15
(B) 13
(C) 11
(D) 17

1. The sedimentation constant of ribosome is 70s. It breaks up into two subunits whose sedimentation constants are :
   (A) 40s & 30s
   (B) 50s & 30s
   (C) 50s & 20s
   (D) 40s & 40s

2. Which of the following is an auto immune disease ?
   (A) Type-1 diabetes
   (B) Type-2 diabetes
   (C) Hemophilia
   (D) Sickle cell anemia

3. Transposon is known as :
   (A) IS element
   (B) Jumping gene
   (C) Conservative gene
   (D) Co-integrate gene

4. Which of following statements is true with reference to enzymes ?
   (A) Holoenzyme = Apoenzyme + Coenzyme
   (B) Apoenzyme = Holoenzyme + Coenzyme
   (C) Coenzyme = Apoenzyme + Holoenzyme
   (D) Holoenzyme = Coenzyme – Apoenzyme

5. In C_3 plants, the first stable compound formed after CO_2 fixation is :
   (A) Oxaloacetic acid
   (B) Malic acid
   (C) Phosphoglyceraldehyde
   (D) 3-phosphoglycerate

6. Phototropic curvature is the result of uneven distribution of :
   (A) Auxin
   (B) Gibberellin
   (C) Phytochrome
   (D) Cytokinins

7. Fructose 6-phosphate is changed to fructose 1, 6-diphosphate by :
   (A) Phosphoglycerate
   (B) Phosphatase
   (C) Phosphofructo – kinase
   (D) Enolase

8. Carrier protein takes part in :
   (A) Water transport
   (B) Active transport of solutes
   (C) Passive transport of solutes
   (D) Transport of gases

9. Breeding crops with higher levels of minerals, vitamins or higher protein and healthier fats is called :
   (A) Micropropagation
   (B) Somatic hybridization
   (C) Biofortification
   (D) Biomagnification

10. Saffron is produced from :
   (A) Roots of *Indigofera*
   (B) Petals of *Rosa*
   (C) Stamens of *Hibiscus*
   (D) Style and stigma of *Crocus*

11. Which of the following is a pseudo-cereal ?
   (A) *Zea mays*
   (B) *Oryza sativa*
   (C) *Triticum aestivum*
   (D) *Fygopyrum esculentum*

12. Pyrethrum is obtained from :
(A) Roots of Chrysanthemum
(B) Mesocarp of coconut
(C) Flower of Chrysanthemum
(D) Leaf bases of Chrysanthemum

13. Blood does not clot inside the body because of :
(A) Oxygenation of blood
(B) Movement of blood
(C) Presence of heparin in blood
(D) Presence of fibrinogen in blood

14. Which of the following is NOT correctly matched ?
(A) Vitamin B_{12}------Pernicious anemia
(B) Vitamin B_1------Beriberi
(C) Vitamin B_2------Pellagra
(D) Vitamin C------Scurvy

15. A short gap in the myelin sheath around a nerve fibre is called :
(A) Dendrite
(B) Node of Ranvier
(C) Axon terminal
(D) None of these

16. The hormone known to participate in metabolism of calcium and phosphorus is :
(A) Glucagon
(B) Calmodulin
(C) Glucocoricoids
(D) Calcitonin

17. Which of the following is unit of length ?
(A) Lunar Month
(B) Kelvin
(C) Candela
(D) Light year

18. A stretched wire has a Young's modulus Y and energy density E. The strain in the stretched wire is :
(A) $\sqrt{\frac{2E}{Y}}$
(B) $\frac{2E}{Y}$
(C) $\frac{4E}{Y}$
(D) $\sqrt{\frac{E}{Y}}$

19. The velocity of sound is maximum in :
(A) Water
(B) Air
(C) Vacuum
(D) Metal

20. A water tank is constructed at the top of a building. The approximate speed with which water will come out of a tap 6 m below the water level of tank :
(A) 120 ms^{-1}
(B) 12 ms^{-1}
(C) 11 ms^{-1}
(D) 17 ms^{-1}

21. Select the correct statement as per Charles' law :
(A) $p.v$ = constant, if T is kept constant
(B) v/T = constant, if p is kept constant
(C) p/T = constant, if v is kept constant
(D) T/p = constant, if v is kept constant

22. According to Stefan Boltzmann law, the total radiation from a black body per second per unit area is directly proportional to the :
(A) Absolute temperature
(B) Square of the absolute temperature
(C) Cube of the absolute temperature
(D) Fourth power of the absolute temperature

23. The factor which has the most significant effect on the amount of chemical-shift artifact in MRI is the :
(A) Matrix size
(B) Phase encoding direction
(C) Magnetic field strength
(D) Gradient strength

24. How many signals does the unsaturated ketone $(CH_3)_2CHCH_2C(O)CH = CH_2$ have in ^1H NMR and ^{13}C NMR spectra ?
(A) five ^1H signals and six ^{13}C signals
(B) six ^1H signals and six ^{13}C signals
(C) six ^1H signals and seven ^{13}C signals
(D) five ^1H signals and seven ^{13}C signals

25. When phenol reacts with haloalkanes in presence of anhydrous $AlCl_3$ and results in the formation of o-cresol & p-cresol, the reaction is known as :
(A) Kolbe's reaction
(B) Reimer-Tiemann reaction
(C) Friedel-Crafts reaction
(D) None of these

26. Fehling's solution is :
(A) Ammonical silver nitrate solution
(B) Alkaline copper sulphate solution complexed with sodium potassium tartarate
(C) Aryl-magnesium halides
(D) None of these

27. Which of the following is not correct ?
(A) Ketones do not react with Tollen's reagent
(B) Aldehydes form carboxylic acids with oxidizing agents
(C) Ketones form acids with Fehling's solution
(D) Aldehydes form acids with Fehling's solution

28. Mass spectrometer separates ions on the basis of which of the following ?
(A) Mass
(B) Charge
(C) Molecular weight
(D) Mass to charge ratio

29. The relationship between free energy change (ΔG) and entropy change (ΔS) at constant temperature T is :
(A) $\Delta G = \Delta H + T\Delta S$
(B) $\Delta H = \Delta G + T\Delta S$
(C) $T\Delta S = \Delta G + \Delta H$
(D) $\Delta G = -\Delta H - T\Delta S$

30. The hybrid state of C in CS_2 should be :
(A) sp^2
(B) sp
(C) sp^3
(D) None of these

31. The molarity of a solution obtained by mixing 750 mL of 0.5 M HCl with 250 mL of 2 M HCl will be :
(A) 0.875 M
(B) 1.00 M
(C) 1.25 M
(D) 2.5 M

32. Paschen series are produced when electron from outer orbits jump to :

(A) 2nd orbit

(B) 3rd orbit

(C) 4th orbit

(D) 5th orbit

33. The equation of common tangent to the parabola's $y^2 = 32x$ and $x^2 = 108y$ is :

(A) $2x + 3x + 12 = 0$

(B) $2x + 3x + 36 = 0$

(C) $2x + 3x - 36 = 0$

(D) $2x + 3x - 12 = 0$

34. Equation of asymptotes of $xy = 7x + 5y$ are :

(A) $x = 7, y = 5$

(B) $x = 5, y = 7$

(C) $xy = 35$

(D) None of these

35. If $\sin(x + y) = \log(x + y)$ then dy/dx equals :

(A) 0

(B) 1

(C) -1

(D) None of these

36. $\int \sec^2 mx\, dx$ is equal to :

(A) $\tan\frac{mx}{m} + k$

(B) $\cot\frac{mx}{m} + k$

(C) $-\cot\frac{mx}{m} + k$

(D) $\sec\frac{mx}{m} + k$

37. If α, β are roots of the equation

$(x - a)(x - b) + c = 0 \ (c \neq 0)$,

then roots of the equation $(x - c - \alpha)(x - c - \beta) = c$ are :

(A) a and b + c

(B) $a^2 + c^2$ and $b^2 + c^2$

(C) a + c and a – c

(D) a + c and b + c

38. If the sum of two roots of the equation $x^3 + ax^2 + bx + c = 0$ is zero, then value of *ab* equals :

(A) c

(B) 2c

(C) –2c

(D) – c

39. If $A = \begin{vmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 3 \end{vmatrix}$ then $A^2 + 3A$ equals :

(A) $18I_3$

(B) 6A

(C) Both (A) and (B)

(D) None of these

40. Let P(x, y) be any given point and $P'(x_1, y_1)$ be the image of P(x, y) after reflection, then the matrix of reflection of P in x-axis is :

(A) $\begin{vmatrix} 1 & 0 \\ 0 & -1 \end{vmatrix}$

(B) $\begin{vmatrix} -1 & 0 \\ 0 & 1 \end{vmatrix}$

(C) $\begin{vmatrix} -1 & 0 \\ 0 & -1 \end{vmatrix}$

(D) $\begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix}$

41. Chemical used for controlling sprouting of onions in storage is :

(A) Maleic Hydrazide

(B) Ethylene

(C) GA

(D) All of these

42. As per Food Safety and Standards Regulations, minimum TSS for fruit jam is :

(A) 72

(B) 63

(C) 45

(D) 65

43. Combination of which of the following is known as gluten ?

(A) Gliadin + Glutelin

(B) Gliadin + Lysine

(C) Glutelin + Glutelin

(D) Lysine + Glutelin

44. Which of the following is true ?

(A) For bread making a hard wheat flour containing a high level of protein is required

(B) For biscuit making wheat flour with low protein is desirable

(C) Both are true

(D) Both are false

45. Which one of the following is not fermented beverage ?

(A) Kefir

(B) Leban

(C) Buttermilk

(D) Kaumiss

46. The process to increase in volume caused by whipping air into the ice cream mix during freezing is called :

(A) Homogenization

(B) Aging

(C) Overrun

(D) Hardening

47. Smoking of meat results in :

(A) Desired flavor

(B) Preservation of meat

(C) Both of the above

(D) None of the above

48. In a sarcomere, the dark line in the centre of each I line is called _____ line.

(A) Z

(B) Y

(C) H

(D) D

49. The basic disaccharide unit of Hyaluranic acid contains :

(A) D-galacturonic acid & N-acetylglucosamine

(B) D-glucuronic acid & N-acetylglucosamine

(C) D-glucuronic acid & N-acetylgalactosamine

(D) None of these

50. The bond angle of water is :

(A) 109.5^0

(B) 107.5^0

(C) 105.4^0

(D) 104.5^0

51. Pyrimidine base found both in DNA & RNA is :
(A) Adenine
(B) Guanine
(C) Cytosine
(D) Uracil

52. Indigenous enzyme present in milk with antimicrobial effect is :
(A) Lactotransglutaminase
(B) B-galactosidase
(C) Lactoperoxidase
(D) Chymosin

53. Which of the following is not an asexual spore ?
(A) Conidiospore
(B) Oidium
(C) Blastospore
(D) Basidiospore

54. Red or 'bloody' bread results from the growth of :
(A) *Rhizopus spp*
(B) *Serratia marcescens*
(C) *Trichosporon variable*
(D) *Bacillus subtillis*

55. What are the intrinsic factors for the microbial growth ?
(A) pH
(B) Moisture
(C) Oxidation-Reduction Potential
(D) All of these

56. Aflatoxin is produced by :
(A) *Aspergillus spp*
(B) *Fusarium spp*
(C) *Salmonella spp*
(D) *Clostridium spp*

57. The sum of the deviations about the mean is always :
(A) Negative
(B) Zero
(C) Total Standard Deviation
(D) Positive

58. Relationship between correlation coefficient and coefficient of determination is that :
(A) Both are unrelated
(B) The coefficient of determination is the square of coefficient of correlation
(C) The coefficient of determination is the square root of the coefficient of correlation
(D) Both are equal

59. In statistics out of 100, marks of 21 students in final exams are as 90, 95, 95, 94, 90, 85, 84, 83, 85, 81, 92, 93, 82, 78, 79, 81, 80, 82, 85, 76, 85 then mode of data is :
(A) 85
(B) 95
(C) 90
(D) 81

60. Wages of 9 workers in Rs. are 170, 82, 110, 100, 150, 150, 200, 116, 250. Quartile deviation is :
(A) 80
(B) 60
(C) 40
(D) 20

Sr. No. .....029.....

ENTRANCE TEST-2017

SCHOOL OF APPLIED SCIENCES & TECHNOLOGY

FOOD SCIENCE & TECHNOLOGY

Question Booklet Series **A**

Total Questions : 60

Time Allowed : 70 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 the 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 Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. 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.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be 'Negative Marking' for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/herself.
14. 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.

SEAL

1. The cytoplasmic bridge between two adjacent plant cells is:
   (A) Middle lamella
   (B) Primary wall
   (C) Secondary wall
   (D) Plasmodesmata

2. The movement of homologous chromosomes towards opposite poles occurs during:
   (A) Telophase
   (B) Anaphase-1
   (C) Anaphase-11
   (D) Metaphase

3. The first restriction endonuclease to be discovered was:
   (A) Hind 11
   (B) EcoR 1
   (C) Bam H1
   (D) Pst 1

4. Which of the following reactions is used for the purpose of recycling enzymes in bioprocess?
   (A) Isomerization
   (B) Phosphorylation
   (C) Immobilization
   (D) Polymerization

5. All the statements are true regarding cytokinins except:
   (A) Promote cell division
   (B) Delay senescence
   (C) Induce dormancy
   (D) Counteract apical dominance

6. Which of the following is mismatched?
   (A) Vitamin A- Xerophthalmia
   (B) Vitamin D- Rickets
   (C) Vitamin K -Beriberi
   (D) Vitamin C -Scurvy

7. Respiratory quotient of fatty substances is general
   (A) Unity
   (B) Zero
   (C) More than one
   (D) Less than one

8. To produce 3 glucose molecules, _____ ATP _____ $NADPH_2$ molecules are required:
   (A) 54, 36
   (B) 54, 30
   (C) 36, 60
   (D) 18, 12

9. Clove is a:
   (A) Seed
   (B) Fruit
   (C) Flower bud
   (D) Vegetative bud

10. Which of the following is NOT true?
   (A) Tea is a product of leaves of a plant
   (B) Coffee is a product of seeds
   (C) Fermentation is involved in the process green tea
   (D) Caffeine is present in both tea and coff

11. Olive oil contains a very high concentration of
   (A) Monounsaturated fatty acids
   (B) Polyunsaturated fatty acids
   (C) Saturated fatty acids
   (D) Both (B) & (C)

12. Coir of commercial importance comes from wh of coconut?
   (A) Epicarp
   (B) Mesocarp
   (C) Seed coat
   (D) Endocarp

13. Ptylin acts in a medium that is:
   (A) Slightly acidic
   (B) Strongly acidic
   (C) Strongly alkaline
   (D) Slightly alkaline

SEAL

14. One haemoglobin carries _____ molecules of oxygen:
(A) 4
(B) 2
(C) 6
(D) 8

15. Blood transfusion is possible between groups:
(A) Donor A & recipient O
(B) Donor B & recipient A
(C) Donor AB & recipient O
(D) Donor O & recipient AB

16. B-cells produce antibodies in response to instructions from:
(A) Killer T-cells
(B) Suppressor T-cells
(C) Moist cells
(D) Helper cells

17. Young's modulus is defined as :
(A) The ratio of linear strain to the normal stress
(B) The ratio of normal stress to the strain
(C) Product of linear strain and normal stress
(D) Square of ratio of normal stress to strain

18. Dimensional formula for latent heat is :
(A) M^2LT^{-2}
(B) ML^2Q^{-1}
(C) L^2T^{-2}
(D) None of these

19. A fluid of density d and viscosity η is flowing with an average velocity v in a pipe of radius r. The Reynolds' number is given by:
(A) $R=2rvd/\eta$
(B) $R= rvd/\eta$
(C) $R= rvd/\eta^2$
(D) $R= 2r\eta v/d$

20. Choose the correct statement:
(A) Sound waves are transverse waves
(B) Sound travels faster through vacuum
(C) Sound travels faster in solid than in gases
(D) Sound waves can be polarized

21. Convective heat transfer is expressed by the equation:
(A) $q=h\ A(T_2-T_1)$
(B) $q=h\ A/\ (T_2-T_1)$
(C) $q=K\ A\ (T_2-T_1)/\ dx$
(D) $q=K\ A\ dx/(T_2-T_1)$

22. All hydrogen atoms :
(A) Have the same resonance frequency
(B) Resonate at different frequencies depending on the environment
(C) Resonate at about the same frequency as carbon
(D) Don't resonate at all

23. Magnetron is:
(A) An amplifier
(B) An oscillator
(C) A phase shifter
(D) Both (A) and (C)

24. Entropy of a thermodynamic system does not change when this system is used for:
(A) Conduction of heat from a hot reservoir to a cold reservoir
(B) Conversion of heat into work isobarically
(C) Conversion of heat into internal energy isochorically
(D) Conversion of work into heat isothermally

25. The ratio between the neutrons in C and Si with respect to atomic masses 12 and 28 is:
(A) 2:3
(B) 3:2
(C) 3:7
(D) 7:3

26. $^{238}U_{92} \xrightarrow{\alpha} A \xrightarrow{\beta} {}^{y}B_{x}$, the value of x and y is :
(A) 90, 234
(B) 91, 234
(C) 91, 238
(D) 92, 234

27. Arrange the following aqueous solutions in order of their increasing boiling points:

i. 10^{-4} M NaCl

ii. 10^{-4} M Urea

iii. 10^{-3} M $MgCl_2$

iv. 10^{-2} M NaCl

(A) i) < ii < iv) < iii)

(B) ii) < i) = iii) < iv)

(C) ii) < i) < iii) < iv)

(D) iv < iii) < i) = ii)

28. Natural rubber is a polymer of:

(A) Styrene

(B) Ethylene

(C) Butadiene

(D) Isoprene

29. The number of sigma and pi bonds in 1-butene-3-yne are:

(A) 5 sigma and 5 pi

(B) 7 sigma and 3 pi

(C) 8 sigma and 2 pi

(D) 6 sigma and 4 pi

30. Phenol is converted into salicylaldehyde:

(A) Etard reaction

(B) Kolbe reaction

(C) Reimer-Tiemann reaction

(D) Cannizaro Reaction

31. Haloform test is NOT given by:

(A) Fomaldehyde

(B) Acetyldehyde

(C) Acetone

(D) α–phenylethyl alcohol

32. Units of rate constants for first and zero order reaction s in terms of molarity (M) are respectively:

(A) Sec^{-1}, M Sec^{-1}

(B) Sec^{-1}, M

(C) M Sec^{-1}, Sec^{-1}

(D) M, Sec^{-1}

33. The focus of the parabola $y^2 - x - 2y + 2 = 0$ is :

(A) (5/4,1)

(B) (1/4,0)

(C) (1, 1)

(D) None of these

34. Let f(2)=4 and f'(2)=4, then

$\text{Lmt.}_{x\to 2}\left(\frac{xf(2)-2f(x)}{x-2}\right)$ is given by:

(A) 2

(B) −2

(C) −4

(D) 3

35. $1+i^2+ i^4 +i^6+ \ldots\ldots\ldots i^{2n}$ is :

(A) Positive

(B) Negative

(C) Zero

(D) Cannot be determined

36. The eccentricity of the rectangular hyperbola is:

(A) 2

(B) $\sqrt{2}$

(C) 0

(D) None of those

37. If the matrix $\begin{pmatrix} 3-x & 2 & 2 \\ 2 & 4-x & 1 \\ -2 & -4 & -1-x \end{pmatrix}$ is singular, then the value of x is:

(A) 0, 3

(B) 0, 4

(C) 3, 4

(D) 3, –3

38. If a > 1, roots of the equation $(1-a)x^2 + 3ax - 1 =$ are:

(A) One positive and one negative

(B) Both negative

(C) Both positive

(D) Both non-real complex

39. The number of real roots of $(x+3)^4+(x+5)^4=16$ is:
(A) 0
(B) 2
(C) 4
(D) None of these

40. If A and B are symmetric matrices of order n (A+B), then:
(A) A+B is skew-symmetric
(B) A+B is symmetric
(C) A+B is a diagonal matrix
(D) A+B is zero matrix

41. Bacteria are involved in the production of:
(A) Nectar
(B) Vinegar
(C) Jam
(D) Squash

42. Jelly in which fruit pieces are suspended is known as:
(A) Jam
(B) Jelly
(C) Marmalade
(D) Squash

43. Continuous use of polished rice in countries with rice as staple food leads to :
(A) Scurvy
(B) Beriberi
(C) Both of these
(D) None of these

44. The brown crust of bread during baking is due to millard reaction between:
(A) Protein and sugar
(B) Sugar and vitamins
(C) Sugar and salt
(D) Starch and lipids

45. Operation flood is related to :
(A) Rice
(B) Fish
(C) Milk
(D) Oils

46. Fat content of double toned milk is:
(A) 1.5%
(B) 2%
(C) 2.5%
(D) 3%

47. The pigment responsible for colour of fresh meat is:
(A) Anthocyanin
(B) Haemoglobin
(C) Myoglobin
(D) All of these

48. Candling in egg is done to:
(A) Judge the egg quality
(B) Preserve the eggs
(C) Break the eggs
(D) All of these

49. $C_{20}H_{32}O_2$ is chemical formula of:
(A) Arachidic acid
(B) Arachidonic acid
(C) Linolic acid
(D) Stearic Acid

50. Which enzyme is responsible for brown discoloration of cut fruits?
(A) Amylase
(B) Lipase
(C) Protease
(D) Polyphenol Oxidase

51. The following polysaccharide is composed of β-glycosidic bonds:

(A) Starch

(B) Glycogen

(C) Dextrin

(D) Cellulose

52. What is the temperature at which water reaches maximum density?

(A) 100 °C (B) 0°C

(C) 4°C (D) 40 °C

53. 70s ribosomes in bacteria consist of:

(A) Two 40s subunits

(B) a 50s and a 30s subunit

(C) a 40s and a 30s subunit

(D) a 50s and a 20 s subunit

54. Sauerkraut is a fermented product of:

(A) Soybean

(B) Cabbage

(C) Cauliflower

(D) Radish

55. Which of the following is not an asexual spore?

(A) Conidium

(B) Oidium

(C) Sprangiospore

(D) Ascospore

56. Which of the following is NOT true about the bacterium responsible for botulism?

(A) Belongs to genera *Clostridium*

(B) Is anaerobic

(C) Produces neurotoxin

(D) Produces hepato-toxin

57. The sum of mode and median of following data 12, 15, 11, 13, 18, 11, 13, 12, 13 is :

(A) 26 (B) 31

(C) 36 (D) 25

58. If the total sum of squares is 20 and sample variance is 5, then total number of observations is:

(A) 15 (B) 25

(C) 4 (D) 35

59. If coefficient of determination is equal to 1, then correlation coefficient:

(A) Must also be equal to 1

(B) Can be either –1 or +1

(C) Can be any value between –1 and +1

(D) Must be –1

60. Chi-square test is used for:

(A) Goodness of fit

(B) Comparing variances

(C) Comparison of means

(D) All of the above

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Sr. No. .....

ENTRANCE TEST-2016

FACULTY OF APPLIED SCIENCE & TECHNOLOGY

M.Sc. FOOD SCIENCE & TECHNOLOGY

Question Booklet Series **A**

Total Questions : 60

Time Allowed : 70 Minutes

Roll No. : | | | | | | |

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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 Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
4. Choose the correct / most appropriate response for each question among the options A, B, C and D and darken the circle of the appropriate response completely. The incomplete darkened circle is not correctly read by the OMR Scanner and no complaint to this effect shall be entertained.
5. 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.
6. Do not darken more than one circle of options for any question. A question with more than one darkened response shall be considered wrong.
7. There will be 'Negative Marking' for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
8. Only those candidates who would obtain positive score in Entrance Test Examination shall be eligible for admission.
9. Do not make any stray mark on the OMR sheet.
10. Calculators and mobiles shall not be permitted inside the examination hall.
11. Rough work, if any, should be done on the blank sheets provided with the question booklet.
12. OMR Answer sheet must be handled carefully and it should not be folded or mutilated in which case it will not be evaluated.
13. Ensure that your OMR Answer Sheet has been signed by the Invigilator and the candidate himself/herself.
14. 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.

1. Pollutants and toxicants are detoxified by :

   (A) SER of liver (B) RER of liver

   (C) Both (A) & (B) (D) None of these

2. Crossing over occurs during :

   (A) Leptotene (B) Pachytene

   (C) Diplotene (D) Diakinesis

3. A substance unrelated to substrate changes the activity of an enzyme. It is :

   (A) Competitive inhibitor (B) Allosteric unit

   (C) Allosteric modulator (D) None of these

4. First hormone produced artificially by culturing bacteria is :

   (A) Insulin (B) Thyroxine

   (C) Testosterone (D) Adrenaline

5. Photorespiration is characteristic of :

   (A) C_3 plants (B) C_4 plants

   (C) CAM plants (D) All of these

6. At the time of seed germination, enzymes are induced to be formed under the influence of :

   (A) Cytokinins (B) Gibberlins

   (C) Ethylene (D) Auxins

7. Common cause of seed and bud dormancy is :

   (A) Ethylene (B) Cytokinins

   (C) Abscisic Acid (D) Both (B) & (C)

8. Kreb's cycle starts with the formation of six carbon compound by reaction between :

(A) Malic acid and Acetyl CoA

(B) Succinic acid and Pyruvic acid

(C) Fumaric acid and Pyruvic acid

(D) Oxalo acetic acid and Acetyl CoA

9. Bile salts are :

(A) Sodium bicarbonate and Sodium taurocholate

(B) Sodium glycocholate and Sodium Carbonate

(C) Sodium glycocholate and Inorganic salts

(D) Sodium glycocholate and Sodium taurocholate

10. In sickle cell anaemia the disorder is caused due to change in chemical nature of :

(A) α-chain of haemoglobin (B) β-chain of haemoglobin

(C) Both the chains (D) None of them

11. In resting nerve, what is true ?

(A) 3 Na^+ are pumped in and 2 K^+ pumped out

(B) 3 Na^+ are pumped out and 2 K^+ pumped in

(C) Na – K pump stops working

(D) None of these

12. Gas released during Bhopal tragedy was :

(A) Methyl Isocyanate (B) Methyl Isothiocyanate

(C) Sodium Isothiocyanate (D) Ethyl Isothiocyanate

13. Triticale is a man made cereal which has been developed from :

(A) Wheat and Oats
(B) Wheat and Rice
(C) Wheat and Gram
(D) Wheat and Rye

14. Opium is obtained from :

(A) Rauvolfia serpentina
(B) Atropa accuminata
(C) Papaver somniferum
(D) Digitalis lanatus

15. Botanical name of tea is :

(A) Piper nigrum
(B) Camellia sinensis
(C) Allium cepa
(D) Capsicum spp

16. Oil yielding legume is :

(A) Carthamus
(B) Glycine max
(C) Ricinus
(D) Vigna sinensis

17. One joule of energy is equal to :

(A) 10^5 Ergs
(B) 10^7 Ergs
(C) 10^{-7} Ergs
(D) 10^{-5} Ergs

18. The work done per unit volume in stretching the wire is equal to :

(A) Stress × strain
(B) Half of stress × strain
(C) $\frac{\text{Stress}}{\text{Strain}}$
(D) $\frac{\text{Strain}}{\text{Stress}}$

19. A rectangular vessel when full of water takes 10 minutes to be emptied through an orifice in its bottom. How much time will it take to be emptied when half filled with water ?

(A) 5 min
(B) 6 min
(C) 7 min
(D) 10 min

20. When sound waves travel from air to water, which of these remains constant ?

(A) Velocity
(B) Frequency
(C) Wavelength
(D) All the above

21. If the temperature of sun is doubled, the rate of energy received on earth will increase by a factor :

(A) 2
(B) 4
(C) 8
(D) 16

22. Which of the following is true about microwaves ?

(A) These are electromagnetic radiations with a frequency of 300 MHz to 300 GHz
(B) These are generated by magnetron
(C) These produce heating effects in moist foods
(D) All the above

23. Which of the following statements is FALSE about NMR experiment ?

(A) The energy required to flip the spin of a proton is in the infrared region of the electromagnetic spectrum
(B) The energy difference between the two spin states depends on the strength of the magnetic field
(C) When energy absorption occurs, the nuclei are said to be in resonance with the electromagnetic radiation
(D) When a proton is aligned with the magnetic field, its energy is lower than when it is aligned against the magnetic field

24. Which of the following phenomenon involves lowest enthalpy change ?

(A) Melting of Ice
(B) Heating of water from 0°C to 100 °C
(C) Vaporization of water
(D) Condensation of water vapours

25. de-Broglie's equation is given as :

(A) $\lambda = \frac{h}{mu}$ (B) $\lambda = \frac{mu}{h}$

(C) $\lambda = \frac{hu}{m}$ (D) None of these

26. Which of the following is not correct ?

(A) ΔH is negative for exothermic reactions

(B) ΔH is positive for endothermic reactions

(C) The heat of neutralization of strong acid with strong base is always the same

(D) The enthalpy of fusion is negative

27. Normality of 2M H_2SO_4 solution is :

(A) 2N (B) 4N

(C) $\frac{N}{2}$ (D) $\frac{N}{4}$

28. β-particle is emitted in radioactivity :

(A) During conversion of proton to neutron

(B) During conversion of neutron to proton

(C) From outermost orbit

(D) All the above

29. (I) 1, 3 Dihydroxybenzene

(II) 1, 4 Dihydroxybenzene

(III) Hydroxybenzene

The order of boiling points of above alcohols is :

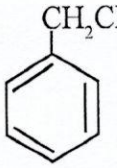
(A) I < II < III (B) I > II > III

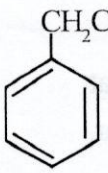
(C) III < I < II (D) III > I > II

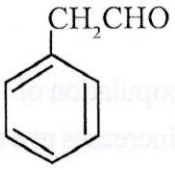
30. $2\,(CH_3)_3\,C\,CHO \xrightarrow{50\%\ NaOH} (CH_3)_3\,C\,CH_2OH + (CH_3)_3\,C\,COONa$ is :

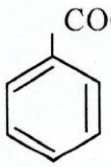
(A) Cannizzaro reaction (B) Aldol Condensation

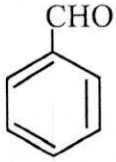
(C) Wittig reaction (D) None of these

31.  $\xrightarrow[\text{dil } HNO_3]{KMnO_4 / OH^-}$ X. Predict X in the reaction :

(A) 

(B) 

(C) 

(D) 

32. Which of the following is a mordant dye ?

(A) Aniline black (B) Congo red

(C) Alizarin (D) Indigo

33. The function $f(x) = \left| \frac{1}{\sqrt{x-4}} \right|$ is continuous in :

(A) [0, 16), (16, ∞) (B) (0, 16), [16, ∞)

(C) [0, 16], [16, ∞) (D) None of these

34. For what value of k is $\frac{4k}{i^5} = 12$:

(A) 3 (B) – 3

(C) 3i (D) – 3i

35. Which of the following is not true ?

(A) The hyperbola $\frac{x^2}{4} - \frac{y^2}{9} = 1$ has no y-intercepts

(B) Given the directrices and foci of a standard hyperbola, it is possible to find its vertices, eccentricity and asymptotes

(C) The point on a parabola closest to the focus is the vertex

(D) The equation of hyperbola with centre at origin, vertices $(0, \pm 4)$ and eccentricity 2 is $x^2 + \frac{y^2}{8} = 1$

36. A culture of cells in a lab has a population of 100 cells when nutrients are added at time $t = 0$. The population N(t) increases at a rate given by $N'(t) = 90\, e^{-0.1t}$ cells/hr. What is N(t) for $t \geq 0$?

(A) $1000 - 90\, e^{-0.1t}$ (B) $1000 - 900\, e^{-0.1t}$

(C) $100 - 900\, e^{-0.1t}$ (D) None of these

37. Which of the following is not true ?

(A) $\begin{bmatrix} 1 & k & 2 \\ 2 & 3k & 5 \\ 1 & 4k & 3 \end{bmatrix} = k \begin{bmatrix} 1 & 1 & 2 \\ 2 & 3 & 5 \\ 1 & 4 & 3 \end{bmatrix}$

(B) If matrices A and B are conformable for multiplication then $(AB)^T = B^T A^T$

(C) Rank of the unit matrix of order 7 is 7

(D) Rank of the singular matrix of order 5 is always less than 5

38. If the general solution of the differential equation :

$(y + x)\frac{dy}{dx} = y - x$ is $\tan^{-1}\left(\frac{y}{x}\right) + h\, \ell n\,(x^2 + y^2) = C$, then $g^2 + h - gh$ equals to :

(A) 5 (B) 4

(C) 3 (D) None of these

39. If α, β and γ $(\gamma < \beta < \alpha)$ are the roots of the equation $3x^3 - 10x^2 + 9x - 2 = 0$, then $3\gamma - \alpha + 2\beta$ equals :

(A) 1 (B) 2

(C) 3 (D) 4

40. What is the value of k so that the roots of the equation $x^3 - 6x^2 - kx - 6 = 0$ are in arithmetic progression ?

(A) 9 (B) 11

(C) –11 (D) –9

41. Idli is a fermented product of :

(A) Wheat + Pulses (B) Maize + Pulses

(C) Rice + Pulses (D) None of these

42. Favism is associated with the consumption of which pulse ?

(A) Green gram (B) Black gram

(C) Broad bean (D) Kidney bean

43. Cranberries are :

(A) Rubus spp. (B) Vaccinium spp.

(C) Citrus spp. (D) Prunus spp.

44. Which has the highest TSS content ?

(A) Squash (B) Single Strength Juice

(C) RTS beverage (D) Puree

45. Lowest fat content is present in which milk ?

(A) Buffalo (B) Cow

(C) Goat (D) Sheep

46. Use of nitrites in meat helps in :

(A) Inhibition of Clostridium Botulinum

(B) Fixing red colour of myoglobin

(C) Imparting flavour to meat

(D) All the above

47. What is holding time and temperature for milk in HTST type pasteurization ?

(A) 30 min at 71.7 °C (B) 15 sec at 61.7 °C

(C) 30 min at 61.7 °C (D) 15 sec at 71.7 °C

48. Which of the following are water soluble proteins ?

(A) Sarcoplasmic proteins
(B) Myofibrillar proteins
(C) Connective tissue proteins
(D) All the above

49. Which of the following is NOT true ?

(A) Lycopene has terpenoid structure
(B) Carotenes contain oxygen
(C) Carotenoids are responsible for yellow and orange colours
(D) Colour of Saffron is due to presence of carotenoid compound

50. Lactose is formed from :

(A) Glucose and Galactose
(B) Glucose and Fructose
(C) Fructose and Galactose
(D) Two molecules of Glucose

51. Which enzymes are used for classification of fruit juices ?

(A) Proteases
(B) Pectinases
(C) Lipases
(D) Endonucleases

52. Which of the following requires lowest water activity ?

(A) Bacterial growth
(B) Mold growth
(C) Non-enzymatic browning
(D) Oxidation

53. A bacillus bacterium with a single flagellum at each end is described as :

(A) Monotrichous
(B) Amphitrichous
(C) Lophotrichous
(D) Peritrichous

54. Gray mold rot is caused by :

(A) Botrytis cinerea
(B) Penicillium digitatum
(C) Aspergillus niger
(D) Fusarium graminearum

55. Which of the following is not a mycotoxin ?

(A) Aflatoxin
(B) Botulinum
(C) Ochratoxin
(D) Patulin

56. Tempeh, a fermented product of Soyabean, is produced by using cultures of :

(A) Aspergillus spp.
(B) Rhizopus spp.
(C) Saccharomyces spp.
(D) Pencillium spp.

57. If Income of five employees is 15,000, 21,000, 16,000, 20,000 and 23,000. The median income is :

(A) 16,000
(B) 19,000
(C) 20,000
(D) 23,000

58. Quartile deviation is given by :

(A) $\frac{Q_3 - Q_1}{2}$
(B) $Q_3 - Q_1$
(C) $\frac{Q_3 - Q_1}{Q_3 + Q_1}$
(D) $\frac{Q_3 + Q_1}{Q_3 - Q_1}$

59.

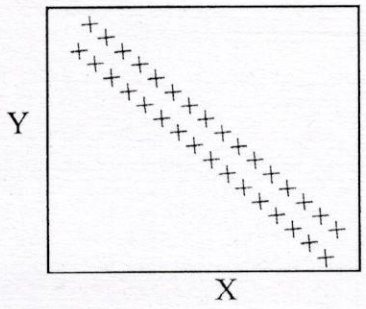


Fig. I

Fig. I shows :

(A) Perfect positive correlation
(B) Perfect negative correlation
(C) High degree of positive correlation
(D) High degree of negative correlation

60. In a study of possible correlations between the height in cm (X) and weight in kg (Y) of Chimpanzees, a sample of 40 animals produces a correlation coefficient of $r = +0.813$ and a regression line with equation $Y = 0.34X + 19.5$. What is the expected weight of an 80 cm tall Chimpanzee ?

(A) 46.7
(B) 177.9
(C) 34.8
(D) 57.1

ROUGH WORK

M.Sc. Food Science and Technology/B

1. Which of the following isomeric alcohols has a chiral carbon atom ?
   (A) n-butyl alcohol (B) iso-butyl alcohol
   (C) sec-butyl alcohol (D) tert-butyl alcohol

2. Which of the following radio-isotopes is used for the sterilization of spices and foods, as well as in cancer radiation therapy ?
   (A) ^{32}P (B) ^{14}C
   (C) ^{60}Co (D) ^{181}I

3. Which of the following statements is incorrect ?
   (A) All perfect crystalline substances have entropy equal to zero at T = 0 K
   (B) Every pure substance has positive entropy which approaches infinity as $T \rightarrow 0$ K
   (C) If the entropy of every element in its most stable state at T = 0 is taken as zero, then every substance has a positive entropy which at T = 0 may become zero
   (D) The entropy of an isolated system increases in the course of a spontaneous change

4. Which of the following molecules does not have infrared active vibrations ?
   (A) N_2 (B) NO
   (C) N_2O (D) CH_4

5. Which of the following statements appropriately describes the origin of microwave heating ?
   (A) The oscillating polar molecules of the medium are in phase with the oscillating high frequency microwave radiation
   (B) The oscillating polar molecules of the medium are ahead in frequency as that of the oscillating high frequency microwave radiation
   (C) The oscillating polar molecules of the medium lag behind the oscillating high frequency microwave radiation
   (D) The non-polar molecules of the medium interact with the oscillating high frequency microwave radiation

6. What is the multiplicity of the signal expected for the hydrogen atom marked by "star" in the ^1H NMR spectrum of the following molecule ?

   $CH_3\text{-}CBr_2\text{-}CH^*_2\text{-}CH_3$

   (A) Singlet (B) Triplet
   (C) Quartet (D) Heptet

7. When we add some sugar to boiling water at its boiling temperature, its boiling ceases at that temperature. This is because :

(A) The vapour pressure of the water decreases and so decreases its boiling point

(B) The boiling point of the water increases due to decrease in its vapour pressure

(C) The boiling point of the water decreases due to increase in its vapour pressure

(D) The vapour pressure of the water increases and so increases its boiling point

8. Which of the following metals is used for treatment of manic depression ?

(A) Li (B) Na

(C) K (D) Cs

9. An alkene on ozonolysis followed by treatment Zn/H_2O yields ethanol, alkene is :

(A) Propene (B) Butene

(C) But-2-ene (D) 2-Methyl propene

10. The acid with least pKa value among the following carboxylic acids is :

(A) Trichloro acetic acid (B) Formic acid

(C) Propanoic acid (D) Acetic acid

11. Which of the following is not a medicinal plant ?

(A) Ephedra sinica (B) Thymus vulgaris

(C) Oryza sativa (D) Lavandula angustifolia

12. Which of the following medicinal plants is not used as spice in foods ?

(A) Datura stramonium (B) Curcuma longa

(C) Allium sativum (D) Crocus sativus

13. The scientific study of the relationships that exist between people and plants is called :

(A) Pharmacolgy (B) Ethnobotany

(C) Ecology (D) Phytochemistry

14. Nitrifying bacteria exemplify :

(A) Photoautotrophs (B) Photoheterotrophs

(C) Chemoheterotrophs (D) Chemoautotrophs

15. Bacteria with tufts of flagella at both ends are called :

(A) Lophotrichous (B) Pertitrichous

(C) Amphitrichous (D) Atrichous

16. Which elements are present in chlorophyll molecule ?

(A) Carbon, Magnesium, Sulfur and Oxygen

(B) Carbon, Sodium, Oxygen and Magnesium

(C) Carbon, Hydrogen, Oxygen, Potassium and Magnesium

(D) Carbon, Hydrogen, Oxygen, Magnesium and Nitrogen

17. Transport of oxygen is an important function of blood. Partial pressure of O_2 is the highest and lowest, respectively, in :

(A) Muscles and heart (B) Lungs and muscles

(C) Heart and lungs (D) Muscles and lungs

18. Moulds causing spoilage of eggs include species of :

(A) Cladosporium (B) Mucor

(C) Thamnidium (D) All of the above

19. The major site of protein breakdown to form free amino acids, is in the :

(A) Kidney (B) Spleen

(C) Liver (D) Bone-Marrow

20. Uric acid is formed from :

(A) Proteins (B) Purines

(C) Pyrimidines (D) Glucose

21. $\lim_{x \to \infty} \frac{\sin x}{x}$ is equal to

(A) ∞ (B) 1

(C) 0 (D) does not exist

22. Real part of $e^{e^{i\theta}}$ is

(A) $e^{\cos\theta}[\cos(\sin\theta)]$ (B) $e^{\cos\theta}[\cos(\cos\theta)]$

(C) $e^{\sin\theta}[\sin(\cos\theta)]$ (D) $e^{\sin\theta}[\sin(\sin\theta)]$

23. If $x + y = K$ is normal to the parabola $y^2 = 12x$, then K is :

(A) 3 (B) 9

(C) –9 (D) –3

24. The value of $\int_0^1 \frac{\tan^{-1} x}{1+x^2}\,dx$ is :

(A) $\pi/4$ (B) $\pi^2/32$

(C) 1 (D) None of these

25. If $xdy = y(dx + ydy)$, $y(1) = 1$ and $y(x) > 0$, then $y(-3)$ is equal to :

(A) 3 (B) 2

(C) 1 (D) 0

26. The integral factor of $(x^2 - 1)\frac{dy}{dx} + 2xy = x^2 - 1$ is :

(A) $(x^2 + 1)$ (B) $\frac{2x}{x^2+1}$

(C) $\frac{x^2-1}{x^2+1}$ (D) None of these

27. Let P be a non-singular matrix such that $I + P + P^2 + ... + P^n = 0$, where 0 denotes the null matrix, then P^{-1} is :

(A) P^{-n} (B) $-(I + P + P^2 + ... + P^n)$

(C) P^n (D) None of these

28. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $|A^3| = 125$, then the value of α is :

(A) ± 1 (B) ± 2

(C) ± 3 (D) ± 5

29. Which of the following is millet ?

(A) Panicum miliaceum (B) Setaria italica

(C) Pennisetum glaucum (D) All the above

30. The number of grain rows on the spike of barley is :

(A) Either 4 or 8 (B) Either 3 or 6

(C) Either 5 or 10 (D) Either 2 or 6

31. Which of the following is the major raw material for commercial production of pectin ?

(A) Apricots (B) Maize

(C) Barley (D) Citrus peels

32. Which of the following is not a citrus fruit ?

(A) Grape fruit (B) Lime

(C) Lemon (D) Avocado

33. Which of the following is a myofibrilar protein ?

(A) Collagen (B) Elastin

(C) Myosin (D) Myoglobin

34. The value for a set of ordered data, for which half of the data is larger in value and half is smaller in value is called :

(A) Mean (B) Median

(C) Range (D) Standard Deviation

35. A mathematical technique for fitting an equation, such as that for a straight line, to experimental data, by minimizing the residual error between the experimental values and the ideal values of a data set, is called :

(A) Standard Deviation (B) Accuracy

(C) Precision (D) Linear regression

36. During replication of DNA, Okazaki fragments are formed in the direction of :

(A) $3' - 5'$ (B) $5' - 3'$

(C) $5' - 5'$ (D) $3' - 3'$

37. Net yield of aerobic respiration during Krebs' cycle per glucose molecule is :

(A) 2 ATP molecules
(B) 8 ATP molecules
(C) 36 ATP molecules
(D) 38 ATP molecules

38. The nucleic acid which bears a codon in its structure is :

(A) r RNA
(B) t RNA
(C) m RNA
(D) None of these

39. Feedback inhibition of enzymes is affected by which of the following ?

(A) Enzymes
(B) Substrate
(C) End products
(D) Intermediate end products

40. Teichoic acid, an additional polysaccharide, is found in the cell wall of :

(A) Gram negative bacteria
(B) Gram positive bacteria
(C) Both the above
(D) None of the above

41. DNA sequences that code for protein are known as :

(A) Introns
(B) Exons
(C) Control regions
(D) Intervening sequences

42. Enzymatic breakdown of cellulose will yield monomers of :

(A) Glucose
(B) Galactose
(C) Fructose
(D) Ribose

43. Pellagra is caused due to deficiency of the vitamin :

(A) Thiamin
(B) Niacin
(C) Pyridoxin
(D) Biotin

44. Which of the following enzymes converts glucose into ethanol during alcoholic fermentation of sugars ?

(A) Invertase
(B) Zymase
(C) Maltase
(D) Urease

45. The discovery of gibberellins is related with one of the following :

(A) Blast disease of rice
(B) Rust disease of wheat
(C) 'Bakanae' disease of rice
(D) Early blight disease of potato

46. Enzyme not found in pancreatic juice is :

(A) Trypsin (B) Lipase
(C) Nuclease (D) Nucleotidase

47. Carboxyhaemoglobin is produced due to :

(A) CO (B) CO_2
(C) NO_3^- (D) SO_4^{2-}

48. Which of the following does not act as neurotransmitter ?

(A) Cortisone (B) Acetylcholine
(C) Epinephrine (D) Norepihephrine

49. Cadmium pollution is associated with disease :

(A) Anaemia (B) Itai itai
(C) Minamata (D) Pneumoconiosis

50. The technique first described to determine incipient spoilage in meat was :

(A) Homogenate Extract Volume (HEV)
(B) Extract Release Volume (ERV)
(C) Plate Count Agar (PCA)
(D) None of these

51. pH of fresh milk is in range of :

(A) 6.0 – 7.0 (B) 4.0 – 5.5
(C) 7.5 – 8.5 (D) 8.5 – 9.0

52. In which of the following Rigor Mortis sets in early ?

(A) Beef (B) Mutton
(C) Pork (D) Chicken

53. India's dairy development programme known as White Revolution (Operation Flood) was carried out by :

(A) Dr. Verghese Kurien (B) Dr. Srilakshmi
(C) Dr. Mascom Speed (D) Dr. Radhakrishnan

54. A rope 1 cm in diameter breaks if the tension in it exceeds 500 N. The maximum tension that may be given to a similar rope of diameter 2 cm is :

(A) 500 N (B) 250 N
(C) 1000 N (D) 2000 N

55. Bernoulli's theorem is based on conservation of :

(A) Momentum (B) Mass
(C) Energy (D) Angular momentum

56. Which of the following statements is not correct regarding a streamline flow ?

(A) The speed of a particle may be different at different points
(B) The velocity of a particle always remains same
(C) The kinetic energy of all the particles arriving at a given point is the same
(D) The momenta of all the particles arriving at a given point are the same

57. Which of the following sets cannot enter into the list of fundamental quantities in any system of units ?

(A) Length, mass and velocity (B) Length, time and velocity
(C) Mass, time and velocity (D) Length, time and mass

58. If you add 100 ml of 0.125 N NaOH solution to a 100 ml of 0.25 N HCl solution, the pH of the resultant solution will be :

(A) 1.20 (B) 0.90
(C) 0.70 (D) 0.42

59. Reversible binding of oxygen in Haemoglobin occurs through :

(A) Fe (B) Cu
(C) Mg (D) Ca

60. Which nucleus with the following characteristics is not NMR active ?

(A) Even mass number and even atomic number
(B) Odd mass number and even/odd atomic number
(C) Even mass number and odd atomic number
(D) None of the above

M.Sc. Food Science and Technology/B

1. Which of the following is a component of HTST pasteurizer ?
   (A) Heating unit (B) Holding unit
   (C) Both (A) and (B) (D) Neither (A) nor (B)

2. Which of the following processes prevents creaming ?
   (A) Homogenization (B) Pasteurization
   (C) Sterilization (D) Classification

3. Which of the following is the primary protein present in connective tissue of meat ?
   (A) Actin (B) Myosin
   (C) Collagen (D) None of the above

4. Which of the following statements is correct about water molecule ?
   (A) Oxygen atom has greater affinity for shared electrons than hydrogen
   (B) Hydrogen has greater affinity for paired electrons
   (C) Both O and H has equal affinity for shared electrons
   (D) None of the above

5. Formation of mucic acid in addition of nitric acid is used to identify :
   (A) Sucrose (B) Galactose
   (C) Starch (D) Pectin

6. Polygalacturonases are the enzymes that act on :
   (A) Starch (B) Cellulose
   (C) Pectin (D) None of the above

7. The number of pyrrole rings in hemoglobin is :
   (A) 2 (B) 4
   (C) 6 (D) 8

8. Probiotics are :
   (A) Useful gut microflora
   (B) Harmful gut microflora
   (C) Bacteriocins produced by gut microflora
   (D) Antibiotics produced by gut microflora

9. Salmonella is a :

(A) Fungus (B) Bacterium
(C) Virus (D) Alga

10. Which of the following causes tuberculosis ?

(A) Mycobacterium (B) Propionibacterium
(C) Serratia (D) Staphylococcus

11. Which of the following is the first phase in microbial growth curve ?

(A) Lag phase (B) Log phase
(C) Stationary phase (D) None of the above

12. Which of the following is required to calculate coefficient of variation ?

(A) Standard deviation (B) Sample mean
(C) Both (A) and (B) (D) Neither (A) nor (B)

13. Which of the below given practices is followed while calculating median of some observed values which are even in number ?

(A) Delete the first value after arranging the data
(B) Delete the last value after arranging the data
(C) Take the mean value of the two middle most observations
(D) Delete the last observation without arranging the data

14. Which of the following is needed while applying t test to judge whether a lot mean differs significantly from population mean ?

(A) Sample mean (B) Population mean
(C) Standard deviation (D) All of the above

15. In regression equation $y = a + bx$, which of the following represents slope of the line ?

(A) a (B) b
(C) x (D) None of the above

16. Which of the following utilizes the products of glycolysis for energy production ?

(A) Mitochondria (B) Chloroplast
(C) Ribosomes (D) Lysosomes

17. In which of the following positions of centromere the anaphasic stage of chromosome is "V" shaped ?

(A) Telocentric (B) Acrocentric
(C) Metacentric (D) Submetacentric

18. Cellular totipotency means :

(A) Synthesis of new cells
(B) Formation of new species
(C) Formation of new plants
(D) Capability of a plant cell to form complete plant

19. Bt cotton is :

(A) Hybrid (B) Cloned plant
(C) Mutated plant (D) Transgenic plant

20. Which of the following represents a point of convergence in the metabolic pathways of carbohydrates, fats and certain amino acids :

(A) α–ketoglutaric acid (B) Cis-Aconitic acid
(C) Isocitric acid (D) None of the above

21. The first stable product in C_4 plants is :

(A) Starch (B) Oxalic acid
(C) Sugar (D) Malic acid

22. Aleurone layer is :

(A) Outer layer of scutellum in contact with endosperm
(B) Layer of pericarp specialized in absorption of water
(C) Layer present in ovule that guides pollen tube
(D) Layer present on the outside of endosperm and having protein grains

23. Which of the following is called ripening hormone ?

(A) NAA (B) IBA
(C) Ethylene (D) GA

24. Botanical name of radish is :

(A) Brassica nigra
(B) Brassica oleraceae
(C) Raphanus sativus
(D) Brassica napa

25. Oil yielding legume is :

(A) Carthamus
(B) Glycine max
(C) Ricinus
(D) Vigna sinensis

26. Capsicum annuum is :

(A) Cumin
(B) Chillies
(C) Garlic
(D) Coriander

27. Drug santonin is obtained from :

(A) Centipeda
(B) Artemisia
(C) Tagetes
(D) Chrysanthemum

28. Hemoglobin has maximum affinity for :

(A) NH_3
(B) CO
(C) CO_2
(D) O_2

29. Major function of hydrochloric acid of gastric juice is :

(A) Activation of enzymes
(B) Kill micro-organisms
(C) Dissolve food
(D) Facilitate absorption of food

30. Universal recipient blood group is :

(A) A
(B) AB
(C) B
(D) O

31. Huge quantities of sewage are dumped in a river. Its BOD will :

(A) Increase
(B) Decrease
(C) Slightly decrease
(D) Remain unchanged

32. When n-hexane is passed over Cr_2O_3/Al_2O_3 at 600°C _____ is formed :

(A) Hexane
(B) Hexyne
(C) Benzene
(D) None of the above

33. Bond angle in alkenes is equal to :

(A) 120° (B) 109° 28′

(C) 180° (D) 60°

34. Monohydric alcohols are prepared by :

(A) Hydrolysis of alkyl halides (B) Hydration of alkenes

(C) Fermentation of carbohydrates (D) All of the above

35. Which of the following is a synthetic colour :

(A) Tartrazine (B) Erythrosine

(C) Indigotine (D) All the above

36. The presence of unpaired electrons in phosphorus atom is explained by which principle :

(A) Aufbau principle (B) Pauli's exclusion principle

(C) Hund's rule (D) Heisenberg's principle

37. Which of the following informations is provided by the dipole moments :

(A) The extend to which a bond is permanently polarized

(B) Geometry of the molecule

(C) Both (A) and (B)

(D) Neither (A) nor (B)

38. In which of the following titrations, one solution acts as a self indicator :

(A) Oxalic acid vs Potassium permanganate

(B) Sodium hydroxide vs Citric acid

(C) Oxalic acid vs Sodium hydroxide

(D) None of the above

39. In a chemical reaction, that quantity that decreases to a minimum is :

(A) Free energy (B) Entropy

(C) Temperature (D) Enthalpy

40. The dimentional formula for stress is :

(A) $ML^{-1}T^{-2}$ (B) $M^0L^0T^0$

(C) MLT^{-2} (D) ML^0T^{-2}

41. If S is stress and Y is young's modulus of material of wire, the energy stored in the wire per unit volume is :

(A) $\frac{S}{2Y}$ (B) $\frac{2Y}{S^2}$

(C) $\frac{S^2}{2Y}$ (D) $2S^2Y$

42. A spherical object of radius r moving with a velocity v experiences a viscous force F given by $F = 6\pi\eta rv$. This formula refers to :

(A) Stokes Law (B) Poiseuille's formula

(C) Bernoulli Theorem (D) Torricelli's Theorem

43. The longitudinal waves having frequencies less than 20 Hz are called :

(A) Ultrasonics (B) Audible waves

(C) Infrasonics (D) Standing waves

44. A copper rod 2 m long has a circular cross section of radius 1 cm. The surface is Insulated so that there is no heat loss. The thermal resistance of the wire will be _____ if the thermal conductivity of copper is 401 $Wm^{-1}K^{-1}$:

(A) 15.9 KW^{-1} (B) 6.3 KW^{-1}

(C) 87.5 KW^{-1} (D) 8.75 KW^{-1}

45. Which of the following is a basic character of an electron ?

(A) Mass (B) Charge

(C) Spin (D) All the above

46. What is the basic requirement for microwave cooking of foods ?

(A) Food must contain water (B) Food must contain energy source

(C) Food should not contain moisture (D) Food should not contain fats

SEAL

47. Which one of the following will raise the temp. of 20g water at 30°C most when mixed with it ?

(A) 20g water at 40°C
(B) 40g water at 35°C
(C) 10g water at 50°C
(D) 4g water at 80°C

48. $\lim_{x \to 0} \frac{e^{\sin x} - 1}{x}$ equals :

(A) 1
(B) 0
(C) –1
(D) ∞

49. If A and B are respectively the real and the imaginary parts of the complex number $\frac{i^{34} - 1}{i^{21} - 1}$, then what is the value of $\frac{A}{2} - B$:

(A) 2
(B) 1
(C) $-\frac{1}{2}$
(D) $\frac{1}{2}$

50. If l is the length of the latus rectum and e is the eccentricity of the ellipse $4x^2 + 5y^2 = 20$, then what is the value of $l - e$:

(A) $\frac{7}{\sqrt{5}}$
(B) $\frac{9}{\sqrt{5}}$
(C) $\frac{\sqrt{5}}{7}$
(D) 1

51. Which of the following is not true ?

(A) $\int_0^{\pi/2} \log \sin x \, dx = -\frac{\pi}{2} \log 2$
(B) $\int_0^{\pi/2} \log \cos x \, dx = -\frac{\pi}{2} \log 2$
(C) $\int_0^{\pi/2} \log \operatorname{cosec} x \, dx = \frac{\pi}{2} \log 2$
(D) $\int_0^{\pi} \log \sin x \, dx = -\frac{\pi}{2} \log 2$

52. What is the solution of the differential equation : $\frac{x}{y}\frac{dy}{dx} - \log y + \log x = 1$

(A) $\log\left(\frac{y}{x}\right) = C$ (B) $\log\left(\frac{y}{x}\right) = cx$

(C) $\log\left(\frac{y}{x}\right) = \frac{c}{x}$ (D) None of the above

53. Which of the following is true :

(A) Inverse of an orthogonal matrix is orthogonal

(B) If A is Hermitian, then adj A is not Hermitian

(C) If A is a square matrix, then $A - A'$ is a symmetric matrix

(D) None of the above

54. If α, β are γ $(\alpha < \beta < \gamma)$ are the roots of the equation $3x^3 - 26x^2 + 52x - 24 = 0$, then roots being in geometrical progression, what is the value of $3\alpha - 2\beta + \gamma$?

(A) 12 (B) 4

(C) 0 (D) None of the above

55. What is the condition that the cubic equation $x^3 - px^2 + qx - r = 0$ has three equal roots ?

(A) $q^2 = 3pr$ (B) $P^2 = 3qr$

(C) $r^2 = 3pq$ (D) $q = 3pr$

56. Heating of foods in hermatically sealed containers is :

(A) Pasteurization (B) Sterilization

(C) Canning (D) Commercial sterilization

57. Which of the following plays a central role in jam making ?

(A) Amylose (B) Amylopectin

(C) Pectin (D) Gelatin

58. Which of the following is used as leavening agent in bread ?

(A) Lactobacillus (B) Sireptococcus

(C) Salmonella (D) Saccharomyces

M.Sc. Food Technology/B

1. The strength of an applied magnetic field in NMR is measured in :

   (A) MHz (B) Lumens

   (C) Newtons (D) Teslas

2. The dimensions of viscosity are :

   (A) $M_1L_1^{-1}T_1^{-1}\theta_1^0$ (B) $M_1L_1^2T_1^{-2}\theta_1^0$

   (C) $M_1L_1^0T_1^0\theta_1$ (D) $M_1L_1^0T_1^0\theta_1^{-1}$

3. Intensity of a sound wave decreases continuously as it is propagated through a liquid because of :

   (A) Spreading loss (B) Attenuation loss

   (C) Neither (A) nor (B) (D) Both (A) and (B)

4. A fluid of density 1200 kg/m^2 flows steadily in a tube with cross section of 1.0 cm^2 at point A and 20 mm^2 at point B. Both the points are in the same horizontal plane. The speed of liquid at A is 10 cm per sec. The difference in pressure at A and B will be :

   (A) 72 Pa (B) 288 Pa

   (C) 144 Pa (D) 0

5. The ratio of normal stress to the volume strain within the elastic limits is called :

   (A) Bulk modulus (B) Modulus of rigidity

   (C) Poisson's ratio (D) Young's modulus

6. If the deformation in a body is small, the stress in a body is proportional to the corresponding strain. This fact is known as :

   (A) Young's Law (B) Stoke's Law

   (C) Bernoulli's theorem (D) Hook's Law

7. Microwaves were discovered by :

   (A) Herchell (B) Hertz

   (C) Marconi (D) Bacquerrel

8. Take the odd one out :

(A) Range (B) Quartile Deviation

(C) Mean (D) Mean Deviation

9. During cellulers metabolism some destructive and highly reactive chemical species are produced. Such metabolic reactions are segregated within :

(A) Peroxisomes (B) Tonoplast

(C) Ribosomes (D) Golgi complex

10. In which of the following phases of cell division, centromere splits into two ?

(A) Telophase (B) Anaphase

(C) Metaphase (D) Prophase

11. Most of the gene mutations are :

(A) Recessive to normal allele

(B) Dominant to normal allele

(C) Lethal

(D) More beneficial than normal allele

12. Which of the following functions is performed by restriction endonucleases ?

(A) Cleaving of DNA at specific sequence

(B) Joining of two DNA molecules

(C) Making a DNA copy of RNA molecule

(D) All the above

13. The end products of pyruvate metabolism in aerobic respiration are :

(A) Ethanol and CO_2 (B) Only CO_2

(C) CO_2 and water (D) Lactic acid

14. Which of the following is active form of vitamin A ?

(A) Retinol (B) Retinal

(C) Retinoic acid (D) All the above

15. Which of the following statements pertains to noncyclic photophosphorylation ?

(A) Only photosystem I is involved

(B) ATP is the only useful product

(C) Photosystem I is first electron donor

(D) NADP is the last electron acceptor

16. Some viable seeds do not germinate despite availability of all environmental conditions. Such seeds are said to be :

(A) Non viable (B) Recessive

(C) Dormant (D) Unripe

17. Which of the following is brinjal ?

(A) Solanum tuberosum (B) Solanum melongena

(C) Solanum nigrum (D) None of the above

18. Which of the following oils contains gossypol ?

(A) Coconut (B) Sesame

(C) Soybean (D) Cotton seed

19. Which of the following is garlic ?

(A) Allium cepha (B) Allium porum

(C) Allium sativum (D) None of the above

20. One of the steps in coffee processing is roasting. Its purpose is :

(A) To develop aroma (B) To inactivate microbes

(C) To destroy antinutritional factors (D) All the above

21. The number of polypeptide chains in haemoglobin molecule is :

(A) 2 (B) 3

(C) 4 (D) 5

22. Pylorus is :

(A) Distal opening of stomach

(B) Junction of esophagus and stomach

(C) Junction of small and large intestine

(D) Distal opening of Trachea

23. Take the odd one out :

(A) Dendrite (B) Neuron

(C) Nephron (D) Axon

24. A substance which does not occur in nature but is introduced by human activity into the atmosphere affecting its composition is called :

(A) Contaminant (B) Pollutant

(C) Additive (D) Adultrant

25. Which of the following is used for clarification of fruit juices ?

(A) Pectinase (B) Glucose oxidase

(C) Hexokinase (D) Catalase

26. Which of the following came into existence in the year 2006 ?

(A) Food Safety and Standards Act (B) FPO

(C) PFO (D) All the above

27. Safe moisture content for storage of cereals is :

(A) 30 % (B) 33%

(C) 23% (D) 13%

28. Protein content of cereals is :

(A) 56–60% (B) 45–55%

(C) 20–25% (D) 7–15%

29. After slaughter of an animal, the pH of its muscle :

(A) Increases
(B) Decreases
(C) Does not change
(D) Increases in the beginning and then decreases

30. Which of the following is used in meat curing ?

(A) Sodium nitrate
(B) Carboxy methyl cellulose
(C) Gelatin
(D) All the above

31. Which of the following is tested to assess the adequacy of pasteurization ?

(A) Transferase activity
(B) Hexokinase activity
(C) Alkaline phosphatase activity
(D) Carboxylase activity

32. Which of the following is used for blue mold cheese ?

(A) Rhizopus
(B) Aspergillus
(C) Penicillium
(D) Bacillus

33. A solution that resists change in pH is called :

(A) Acid
(B) Base
(C) Salt
(D) Buffer

34. Which of the following is pentose ?

(A) Ribose
(B) Xylose
(C) Arabinose
(D) All the above

35. Which of the following is isomerase ?

(A) Mutase
(B) Racemase
(C) Epimerase
(D) All the above

36. Which of the following is present in the tetrapyrole centre of chlorophyll molecule ?

(A) Iron
(B) Manganese
(C) Magnesium
(D) Zinc

37. Coenocytic mycelium refers to :

(A) Nonseptate mycelium (B) Aerial mycelium

(C) Submerged mycelium (D) Coloured mycelium

38. Which of the following is fermented milk product ?

(A) Yoghurt (B) Kefir

(C) Koumiss (D) All the above

39. Which of the following refers to single cell protein (SCP) ?

(A) Protein present in one plant or animal cell

(B) Any protein present in highest quantity in a cell

(C) Microbial cells grown and harvested for animal or human food

(D) Protein needed to sustain one cell

40. Keeping microbes out of any system or food item is known as :

(A) Sterilization (B) Commercial Sterilization

(C) Asepsis (D) Pasteurization

41. If $f(x) = (x+1)(x+2).....(x+n)$, then $f'(0)$ equals :

(A) $n!$ (B) $1+\frac{1}{2}+\frac{1}{3}.....+\frac{1}{n}$

(C) $\frac{n!}{1+\frac{1}{2}+\frac{1}{3}.....+\frac{1}{n}}$ (D) $n!\left(1+\frac{1}{2}+\frac{1}{3}+.....\frac{1}{n}\right)$

42. The modulus of $\frac{1-i}{1+i}$ is :

(A) 1 (B) -1

(C) 2 (D) None of the above

43. The number of normals to $y^2 = 4ax$ passing through any point is :

(A) 1

(B) 2

(C) 3

(D) Dependant on the position of the point

44. $\int \frac{1}{e^x - 1}\, dx$ is equal to :

(A) $\log\left(e^x - 1\right)$ (B) $\frac{1}{e^x - 1}$

(C) $\frac{e^x - 1}{e^x}$ (D) $\log \frac{e^x - 1}{e^x}$

45. The solution of the differential equation $\frac{dy}{dx} = xy + x + y + 1$ is :

(A) $c\left(y+1\right) = e^x$ (B) $c(y+1) = e^{\frac{x^2 + 2x}{2}}$

(C) $cy = e^{x^2+2x}$ (D) None of the above

46. If $A = \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$, then A^4 is equal to :

(A) $\begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

47. The inverse of the matrix $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ is :

(A) $\begin{bmatrix} 0 & -1 \\ -1 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 0 & 1 \\ 1 & -1 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & -1 \\ -1 & 0 \end{bmatrix}$

48. If α, β and γ are roots of $x^3 + 2x^2 + 3x + 4 = 0$, then $\alpha^2 + \beta^2 + \gamma^2$ is equal to :

(A) 2 (B) –2

(C) 3 (D) –3

49. If x and y are independent, the value of regression coefficient of y on x is equal to :

(A) 0 (B) 1

(C) Infinity (D) Any positive value

50. The mean difference between nine paired observations is 15 and the standard deviation of differences is 5. The value of statistic t is :

(A) 27 (B) 9

(C) 3 (D) 0

51. Which of the following is needed to calculate the atomic weight of an element ?

(A) Relative abundances

(B) Mass of individual isotopes in atom

(C) Both (A) and (B)

(D) Neither (A) nor (B)

52. Gravimetric analysis depends on :

(A) Titration data (B) Optical density

(C) Wave length (D) Weight data

53. The experimental discovery that the heat of reaction is independent of the reaction method is credited to :

(A) Germain Hess (B) Francis Bacon

(C) R.A. Millikan (D) None of the above

54. According to group displacement law when an alpha particle is emitted, the daughter element is displaced in the periodic table to :

(A) One place to the left (B) Two places to the left

(C) One place to the right (D) Two places to the right

55. 0.2 g of an organic compound containing carbon, hydrogen and oxygen yielded on combustion 0.147 g carbon dioxide and 0.12 g water, the percentage of carbon in the substance is :

(A) 74.2 (B) 26.8

(C) 10.04 (D) 20.04

56. Which of the following is used for preparation of paraffins ?

(A) Heating of anhydrous sodium salt of fatty acids with soda lime

(B) Reducing alkyl halides

(C) Both (A) and (B)

(D) Neither (A) nor (B)

57. Which of the following is used for ripening of fruits like banana ?

(A) Ethylene (B) Methane

(C) Ethane (D) Propane

58. Which of the following pertains to acetylene ?

(A) It burns with smoky flame

(B) It decolourizes bromine water

(C) It gives white precipitate with ammoniacal silver nitrate

(D) All the above

59. The formula $\frac{\sigma}{\bar{x}} \times 100$ is used to calculate :

(A) Correlation (B) Mode

(C) Median (D) Coefficient of variation

60. The rate of heat transfer through a 3×4 m concrete wall having a thickness of 0.2 m and thermal conductivity of 1.1 w m^{-1} with a temp. of 22° C on one side and 35°C on the other side is :

(A) 858 W (B) 1452 W

(C) 2310 W (D) 1100 W

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1. The bond angle between two hydrogen atoms in liquid water is :
   (a) 95° (b) 105°
   (c) 115° (d) 109°

2. Which of the following is a ketose sugar ?
   (a) Glucose (b) Fructose
   (c) Sucrose (d) All the above

3. Thickening of water during cooking of rice is because of :
   (a) Gelatinization of starch (b) Gel formation by pectin
   (c) Gel formation by rice protein (d) None of the above

4. Which of the following link with pectin in plant cell wall ?
   (a) Magnesium (b) Iron
   (c) Calcium (d) Zinc

5. Which of the following form bulk of wheat ?
   (a) Endosperm (b) Testa
   (c) Radicle (d) Plumule

6. Which of the following contain plant pigments ?
   (a) Plasma membrane (b) Cell wall
   (c) Ribosomes (d) Plastids

7. Specific sequence of amino acids joined by peptide bonds in proteins refers to their :
   (a) Primary structure (b) Secondary structure
   (c) Tertiary structure (d) Quaternary structure

8. Which of the following facilitates muscle contraction in live animals ?
   (a) Gelatin and Collagen (b) Albumin and globulin
   (c) Haemoglobin and myoglobin (d) Actin and myosin

9. Cray fish is a :
   (a) Crustacean shell fish (b) Mollusk shell fish
   (c) Fat salt water fin fish (d) Fat fresh water fish

10. Vitelline membrane in egg surrounds :
    (a) Albumen (b) Yolk
    (c) Shell (d) All the above

11. Which of the following is used as a measure of protein quality ?
    (a) Biological value (b) Net protein utilization
    (c) Protein efficiency ratio (d) All the above

12. Which is the major protein in milk ?
    (a) Casein (b) Zein
    (c) Glutin (d) Actin

13. Which of the following statements is true about rancidity ?
    (a) More unsaturated the fat, greater are the chances of rancidity
    (b) More saturated the fat, greater are the chances of rancidity
    (c) Saturation of fatty acids is not related to rancidity
    (d) Autoxidation of fatty acids never leads to rancidity

14. Lux (*lx*) is the unit of :
    (a) Irradiation (b) Absorbed radiation
    (c) Illuminance (d) Luminous flux

15. The formula for calculating frictional resist during fluid flow is :
    (a) $\frac{m\Delta\rho_f}{\rho}$ (b) $\frac{1}{2} mV^2$
    (c) mgh (d) None of the above

16. Which of the following pertains to Fourier's Law of heat transfer ?
    (a) Heat flux is proportional to temperature gradient
    (b) Heat transfer depends on composition of medium
    (c) Heat transfer is inversely proportional to density of medium
    (d) All the above

17. Reynold's number is a function of :
    (a) Tube diameter (b) Average velocity
    (c) Fluid density (d) All the above

18. Who quantized characteristics of light ?
    (a) John Dalton (b) J.J. Berzelius
    (c) J.J. Thompson (d) Max Plank

19. Electrons accommodated in the orbitals of third and fourth shell of calcium are as :
    (a) $3s^2, 3p^6, 3d^2, 4s^0$ (b) $3s^2, 3p^6, 3d^0, 4s^2$
    (c) $3s^2, 3p^6, 3d^1, 4s^2$ (d) $3s^2, 3p^6, 3d^2, 4s^2$

20. Many of the interesting properties of water are because of its :
    (a) Dipole nature (b) High boiling point
    (c) Low freezing point (d) Latent heat

21. An end to end overlap of 'p' orbitals results in :
    (a) Sigma bond (b) Pi bond
    (c) Hydrogen bond (d) None of the above

22. A solution of pure phenol in ethanol has an absorbance of 0.83 at 270 nm, using 1cm cell. What was the concentration of phenol, if the absorptivity at the above wavelength was 1400 ?
    (a) 5.9×10^{-4} M (b) 1162 M
    (c) 0.16×10^{4} M (d) None of the above

23. Which of the following has a sulfhydryl group ?
    (a) Histidine (b) Glutamic acid
    (c) Tyrosine (d) Cysteine

24. Which of the following is a dicarboxylic acid ?
    (a) Oxalic acid (b) Malonic acid
    (c) Succinic acid (d) All the above

25. Which of the following statements is true ?
    (a) Some prokaryotes have nitrogen fixing ability
    (b) All prokaryotes have nitrogen fixing ability
    (c) All eukaryotes have nitrogen fixing ability
    (d) Neither prokaryotes nor eukaryotes have nitrogen fixing ability

26. Which of the following possess sites for oxidative phosphorylation in aerobic respiration ?
    (a) Cristae of mitochondria (b) Matrix of mitochondria
    (c) Ribosomes (d) Cisternae

27. The process of pairing up of homologous chromosomes during cell division is called :
    (a) Linkage (b) Crossing over
    (c) Conjugation (d) Synapsis

28. A change in DNA structure is known as :
    (a) Chromosomal aberration (b) Point mutation
    (c) Somatic mutation (d) None of the above

29. The compounds which change the shape of active site in an enzyme are called :
    (a) Coenzymes (b) Allosteric inhibitors
    (c) Cofactors (d) Prosthetic groups

30. Maltose is :
    (a) Glucose + Glucose (b) Glucose + Fructose
    (c) Glucose + Galactose (d) Fructose + Fructose

31. Coenzymes are derived from :
    (a) Vitamins (b) Proteins
    (c) Carbohydrates (d) Fats

32. Which of the following statements is not true about non-cyclic photophosphorylation ?
    (a) Useful products include ATP and reduced NADP
    (b) First electron donor is water
    (c) Last electron acceptor is photosystem I (PSI)
    (d) Both photosystems are involved

33. Prechilling before germination of the seeds of apple and plum is expected to :
    (a) Break dormancy (b) Increase gibberllin activity
    (c) Reduce growth inhibitors (d) All the above

34. Which of the following promotes rooting ?
    (a) NAA (b) 1 BA
    (c) 2, 4 - D (d) 2, 4, 5 - T

35. *Pennisetum glaucum* is scientific name for :
    (a) Maize (b) Oats
    (c) Barley (d) Pearl millet

36. An oil becomes solid on :
    (a) Chlorination
    (b) Oxidation
    (c) Hydrogenation
    (d) Winterization

37. Crocin is the component of :
    (a) Saffron
    (b) Cumin
    (c) Turmeric
    (d) All the above

38. Which of the following is used as medicinal plant ?
    (a) *Ginko biloba*
    (b) *Hypericum perforatum*
    (c) *Zingiber officinale*
    (d) All the above

39. Which of the following pertains to active transport ?
    (a) Energy consuming transport
    (b) Movement is against concentration gradient
    (c) Both (a) and (b)
    (d) Neither (a) nor (b)

40. Which of the following is a leavening agent in bread ?
    (a) Carbon dioxide
    (b) Lactic acid
    (c) Sugar
    (d) Gluten

41. Water activity refers to :
    (a) Temperature of water
    (b) Microbial load of water
    (c) Movement of water
    (d) Availability of free water

42. Which of the following is a longitudinal wave ?
    (a) X - Rays
    (b) γ - Rays
    (c) Light waves
    (d) Sound waves

43. Modulus of rigidity is defined as :
    (a) Ratio of lateral strain to longitudinal strain
    (b) Ratio of normal stress to volume strain
    (c) Ratio of tangential stress to shearing strain
    (d) Ratio of longitudinal stress to longitudinal strain

44. The theoretical value of Poisson's ratio lies between :
    (a) -1 and $+ \frac{1}{2}$
    (b) Zero and $+ \frac{1}{2}$
    (c) Zero and $+1$
    (d) Zero and -1

45. A refrigerator is a :

(a) Heat engine (b) An electric motor

(c) Heat engine working backwards (d) Air cooler

46. Which of the following is not a pathogenic microbe ?

(a) *Clostriduim* (b) *Salmonella*

(c) *Shigella* (d) *Lactobacillus*

47. Which of the following is controlled in HACCP ?

(a) Biological hazards (b) Chemical hazards

(c) Physical hazards (d) All the above

48. Tick the odd one :

(a) Mean (b) Mode

(c) Standard Deviation (d) Median

49. National Institute of Nutrition is located at :

(a) Delhi (b) Mumbai

(c) Mysore (d) Hyderabad

50. The percentage of water in milk is :

(a) 88 (b) 78

(c) 98 (d) 94

51. Which of the following is present in tea leaves ?

(a) Phenols (b) Phenyl alanine

(c) Aspartic acid (d) All the above

52. Vitamin C is :

(a) Aspartic acid (b) Ascorbic acid

(c) Benzoic acid (d) None of the above

53. A real valued function f defined on domain D is said to be monotonically non-decreasing for $x, y \in D$ if :

(a) $f(x) > f(y)$ (b) $f(x) \geq f(y)$

(c) $fx < f(y)$ (d) None of the above

54. For any positive integer n $\lim_{x \to a} \frac{x^n - a^n}{x - a}$ is equal to :

(a) a^n (b) na^n

(c) na^{n-1} (d) None of the above

55. The multiplicative inverse of $2 - 3i$ is :

(a) 5 (b) 1

(c) 12 (d) None

56. Length of the latus rectum of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ is :

(a) $\frac{2a}{b}$ (b) $\frac{2b^2}{a}$

(c) $\frac{2b^2}{a^2}$ (d) None of the above

57. The degree of a polynomial (in one variable) is always :

(a) A natural number (b) A whole number

(c) An integer (d) A rational number

58. The square roots of all positive integers are :

(a) Irrational (b) Not irrational

(c) Both (a) and (b) (d) None

59. Two inconsistent linear simultaneous equations will have :

(a) One solution (b) Two solutions

(c) No solution (d) Infinite solutions

60. Let $Z = a + ib$ be a complex number, then the conjugate of Z denoted by $\bar{Z}$ is equal to :

(a) $a + ib$ (b) $a - ib$

(c) $a + b$ (d) None