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| Seat No. | |
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P.G. Entrance Examination, June - 2022
M.Sc. Biotechnology/Biochemistry/Medical Information
Management
Code. No. 58722/58725/77888

Day and Date : Sunday, 12 - 06 - 2022

Total Marks : 100

Time : 03.30 p.m. to 05.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Each question carries one mark.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Follow the instructions given on OMR sheet.
 - 5) Rough work shall be done on the sheet provided at the end of question paper.

- 1) Which of the following reptile has four chambered heart?
 - A) Turtle
 - B) King cobra
 - C) Crocodile
 - D) Sphenodon

- 2) The folded states of globular proteins in aqueous solutions are stabilized primarily by _____.
 - A) hydrophobic interactions
 - B) peptide bonds
 - C) phosphodiester bonds
 - D) ionic bonds

- 3) Washing soda is the common name for
 - A) Sodium carbonate
 - B) Calcium bicarbonate
 - C) Sodium bicarbonate
 - D) Calcium carbonate

- 4) Beta-oxidation of fatty acids occurs in _____
- A) Peroxisome
 - B) Golgi bodies
 - C) Mitochondria
 - D) Endoplasmic Reticulum
- 5) This molecule acts as molecular chaperones to assist the folding of proteins
- A) Vitamins
 - B) Carbohydrates
 - C) Proteins
 - D) Lipids
- 6) Which of the following enzyme is responsible for the conversion of glucose 1-phosphate to glucose 6-phosphate?
- A) Epimerase
 - B) Phosphoglucomutase
 - C) Glycogen phosphorylase
 - D) Isomerase
- 7) Which of the following is true about t_m ?
- A) The higher the content of $G \equiv C$ base pairs, the lower the t_m
 - B) The higher the content of $A = T$ base pairs, the higher the t_m
 - C) It can be termed as renaturation temperature
 - D) The higher the content of $G \equiv C$ base pairs, the higher the t_m
- 8) Which of the following is an example of epimers?
- A) Mannose & Glucose
 - B) Glucose & Ribose
 - C) Galactose & Mannose
 - D) Glucose & Galactose

- 9) Which of the following is true about phosphodiester linkage?
- A) 3'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
 - B) 3'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide
 - C) 5'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide
 - D) 5'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
- 10) When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained?
- A) Straight line with negative slope
 - B) Sigmoidal curve
 - C) Parabola
 - D) Hyperbolic curve
- 11) Which of the following statements is correct about column chromatography?
- A) Resolution improves as column length increases
 - B) Mobile phase is a porous solid material kept in the column with appropriate chemical characteristics
 - C) Stationary phase is a buffered solution that percolates through the mobile phase
 - D) Large proteins exit the column faster than tiny proteins
- 12) The important function of disulfide bond in amino acid is to help structural -
- A) Stability
 - B) Maturation
 - C) Denaturation
 - D) Renaturation
- 13) $[a_1, a_2, a_3]$ is called a _____
- A) Row matrix
 - B) Column matrix
 - C) Determinant
 - D) Database

- 14)** Which one of the following amino acids may be considered a hydrophobic amino acid at physiological pH of 7.4?
- A) Isoleucine
 - B) Arginine
 - C) Aspartic acid
 - D) Threonine
- 15)** Which one of the following is an acidic amino acid?
- A) Valine
 - B) Aspartate
 - C) Lysine
 - D) Asparagine
- 16)** Which is a characteristic of both an α -helix and a β -pleated sheet?
- A) Both can be anti-parallel structures
 - B) Both form interactions involving the oxygens of peptide bonds
 - C) Both are found only within multimeric proteins
 - D) Both are denatured when heat breaks peptide bonds
- 17)** Antibody structure is _____ shaped.
- A) W
 - B) X
 - C) Y
 - D) Z
- 18)** _____ these are aromatic amino acids.
- A) Alanine, Valine, Glycine
 - B) Tyrosine, Tryptophan, Phenylalanine
 - C) Histidine, Tyrosine, Alanine
 - D) Tryptophan, Glycine, Aspartate
- 19)** The following are methods of sterilization EXCEPT
- A) Dry heat sterilization
 - B) Autoclaving
 - C) Sterilization by filters
 - D) Laminar airflow

- 20)** Culture freshly prepared from isolated tissue is known as ____.
- A) Organ culture
 - B) Primary culture
 - C) Cell line
 - D) Histotypic culture
- 21)** Which of the following is not an application of tissue culture?
- A) Rapid Clonal propagation
 - B) Somachlonal Variations
 - C) Embryo rescue
 - D) Transgenic plants
- 22)** Optimum pH for plant tissue culture medium is ____.
- A) 7.5
 - B) 8
 - C) 5.7
 - D) 8.5
- 23)** The production of secondary metabolites requires the use of ____.
- A) Meristem
 - B) Protoplast
 - C) Axillary buds
 - D) Cell suspension
- 24)** 20% of 2 is equal to
- A) 20
 - B) 4
 - C) 0.4
 - D) 0.04
- 25)** What is Callus?
- A) Tissues that grow to form an embryoid
 - B) An unorganized actively dividing the mass of cells maintained in a culture
 - C) An insoluble carbohydrate
 - D) A tissue that grows from an embryo

- 26)** Which of the following is not a feature of the plasmid?
- A) Single stranded
 - B) Independent replication
 - C) Circular structure
 - D) Small, circular double-stranded
- 27)** In Bt cotton, the Bt toxin present in plant tissue as protoxin is converted into active toxin due to ____
- A) Alkaline pH of the insect gut
 - B) Acidic pH of the insect gut
 - C) Action of gut microorganism
 - D) Presence of conversion factors in insect gut
- 28)** Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?
- A) X phage
 - B) Retrovirus
 - C) Ti plasmid
 - D) PBR 322
- 29)** The expression of a transgene in the target tissue is identified by a
- A) Transgene
 - B) Promoter
 - C) Enhancer
 - D) Reporter
- 30)** The human genome project was launched in the year
- A) 1980
 - B) 1973
 - C) 1990
 - D) 1989

- 31)** The Golden Rice variety is rich in
- A) Vitamin C
 - B) B-carotene and ferritin
 - C) Biotin
 - D) Lysine
- 32)** ELISA is
- A) Using radiolabelled second antibody
 - B) Usage of RBCs
 - C) Using complement-mediated cell lysis
 - D) Addition of substrate that is converted into a coloured end product
- 33)** What is the concentration of CO₂ required for culturing animal cells?
- A) 2-5%
 - B) 1-10%
 - C) 10-15%
 - D) 15-20%
- 34)** The technique used to locate specific genes in chromosome is
- A) colony hybridization
 - B) in situ hybridization
 - C) dot blot technique
 - D) western blotting
- 35)** A nano biological recognition component, which is involved in interacting with the analyte molecule is called as _____
- A) biosensor
 - B) probe
 - C) nano biosensor
 - D) quantum dots
- 36)** Hybridoma is a cell formed by the fusion of
- A) Plasma cell with a plasma cell of another species
 - B) T cell with a myeloma cell
 - C) Macrophage with a myeloma cell
 - D) Plasma cell with a myeloma cell

- 37)** Interferons are
- A) Anti bacterial proteins
 - B) Anti-viral proteins
 - C) Bacteriostatic proteins
 - D) All of these
- 38)** Animal cell cultures are used widely for the production of
- A) Insulin
 - B) Somatostatin
 - C) mAbs
 - D) Thyroxine
- 39)** Transposon is known as
- A) IS element
 - B) Jumping gene
 - C) Conservative gene
 - D) Cp integrate gene
- 40)** In SDS-PAGE, separation is based on
- A) Molecular weight
 - B) Shape
 - C) Charge
 - D) All of the above
- 41)** Which of the following is used to preserve specimens in the biology laboratory?
- A) Phenol
 - B) Benzaldehyde
 - C) Formaldehyde
 - D) Acetic acid
- 42)** Carbon, Diamond and Graphite are together called _____
- A) Isomers
 - B) Isotopes
 - C) Allotrope
 - D) Isomorphs

- 43) Which of the following is not a strong acid?
- H_2SO_4
 - CH_3COOH
 - HCl
 - HBr
- 44) Silver Mirror test is given by which one of the following compounds?
- Benzophenone
 - Acetic acid
 - Acetone
 - Formaldehyde
- 45) A radioactive substance has a half-life of four months, three-fourth of the substance would decay in _____
- 3 months
 - 4 months
 - 8 months
 - 12 months
- 46) The main product of glycolysis under aerobic conditions is _____
- Pyruvate
 - Lactate
 - None of these
 - Both A and B
- 47) What is the IUPAC name of the compound $(\text{CH}_3)_3\text{CCH}_2\text{Cl}$?
- 1-Chloro-2,2-dimethylpropane
 - 1-Chloro-2,2,2-trimethylethane
 - 2-Chloromethyl-2-methylpropane
 - 2,2-Dimethyl-1-Bromopropane
- 48) Which among the following is most electronegative element?
- Chlorine
 - Fluorine
 - Bromine
 - All of them have same electronegativity

- 49)** Which of the following colloidal system represents a gel?
- A) Solid in liquid
 - B) Solid in gas
 - C) Liquid in solid
 - D) Liquid in gas
- 50)** Which of the following is the correct Gibbs equation?
- A) $\Delta G = \Delta H + T\Delta S$
 - B) $\Delta G = \Delta H - T\Delta S$
 - C) $\Delta G = \Delta H - 2T\Delta S$
 - D) $\Delta G = \Delta H - 3T\Delta S$
- 51)** A pair of solutions bear the same osmotic pressure. What is this pair of solutions called?
- A) Hypertonic
 - B) Hypotonic
 - C) Isotonic
 - D) Osmolarity
- 52)** Which of the following will lead to an increase in the rate of the reaction?
- A) Decrease in temperature
 - B) Decreasing concentration of reactants
 - C) Addition of catalyst
 - D) Addition of inhibitor
- 53)** In polar molecular solids, the molecules are held together by _____
- A) Dipole-dipole interactions
 - B) Dispersion forces
 - C) Hydrogen bonds
 - D) Covalent bonds
- 54)** Which among the following is a Noble Gas?
- A) Nitrogen
 - B) Hydrogen
 - C) Oxygen
 - D) Helium

- 55)** Activated charcoal is used to remove colouring matter from pure substances. It works by _____
- A) Oxidation
 - B) Reduction
 - C) Adsorption
 - D) Bleaching
- 56)** Certain biomolecular reactions which follow the first order kinetics are called _____ reactions.
- A) First order
 - B) Unimolecular
 - C) Bimolecular
 - D) Pseudo first order
- 57)** The protein moiety of an enzyme is known as _____
- A) Holoenzyme
 - B) Apoenzyme
 - C) Coenzyme
 - D) Enzyme
- 58)** A tissue that does not contain lignin is _____
- A) Sclerenchyma
 - B) Parenchyma
 - C) Collenchyma
 - D) Chlorenchyma
- 59)** Electrons from the excited chlorophyll molecules of PS-II are first accepted by _____
- A) Pheophytin
 - B) Ferredoxin
 - C) Cytochrome f
 - D) Cytochrome b

- 60)** Reduction of NADP occurs in _____
- A) Oxidative photophosphorylation
 - B) Cyclic photophosphorylation
 - C) Non-cyclic photophosphorylation
 - D) None
- 61)** The repository of plant taxonomy and systematics is called as _____
- A) Red data book
 - B) Herbarium
 - C) Botanical garden
 - D) Genomic library
- 62)** In the five-kingdom system of classification, into which kingdom would you classify nitrogen-fixing organisms and archaea?
- A) Fungi
 - B) Plantae
 - C) Protista
 - D) Monera
- 63)** Hydrophytes exchange gases through _____
- A) lenticels
 - B) stomata
 - C) general surface by diffusion
 - D) all of these
- 64)** A characteristics feature of bryophytes is _____
- A) a dominant and parasitic sporophyte
 - B) a dominant and spore-producing gametophyte
 - C) a small sporophyte phase, which is dependent on the gametophyte
 - D) sporophytes stay for a longer duration
- 65)** Mucor is a _____
- A) Parasitic fungus
 - B) Saprophytic fungus
 - C) Facultative saprophytic fungus
 - D) None of the above

- 66)** In biotechnological studies, the alga that is exploited as a rich source of protein is _____
- A) Spirogyra
 - B) Spirulina
 - C) Chlamydomonas
 - D) Scytonema
- 67)** Which of the following has non-flagellated isogamous gametes?
- A) Spirogyra
 - B) Chlamydomonas
 - C) Volvox
 - D) Fucus
- 68)** Analysis of protein antigen is by _____
- A) Southern blot
 - B) Northern blot
 - C) Western blot
 - D) None of these
- 69)** RBCs of mammals are _____
- A) Non-nucleated, biconcave and circular
 - B) Nucleated, biconvex, oval
 - C) Non-nucleated, biconvex, oval
 - D) Non-nucleated, biconvex and circular
- 70)** The phenotypic ratio of monohybrid cross is _____
- A) 3 : 1
 - B) 1 : 2 : 1
 - C) 2 : 1 : 1
 - D) 9 : 3 : 3 : 1

- 71)** Which is the anti-coagulant substance in blood?
- A) Thrombin
 - B) Globin
 - C) Fibrinogen
 - D) Heparin
- 72)** The site of fertilization in the female mammalian reproductive system is ____
- A) Vagina
 - B) Uterus
 - C) Fallopian tube
 - D) Ovarian fimbriae
- 73)** Salamander is an example of ____
- A) Reptile
 - B) Osteichthyes
 - C) Amphibians
 - D) Mammals
- 74)** Arthropods excrete through _____
- A) Malpighian tubules
 - B) Pores
 - C) Nephridia
 - D) Kidneys
- 75)** Pituitary gland is located in ____
- A) Intestine
 - B) Liver
 - C) Kidney
 - D) Brain
- 76)** The study of relationships among different organisms is called _____
- A) Taxonomy
 - B) Biology
 - C) Systematics
 - D) Ornithology

- 77)** Fossils are most commonly preserved in ____.
- A) Metamorphic rocks
 - B) Igneous rocks
 - C) Sedimentary rocks
 - D) Any type of rock
- 78)** Bacteria which need oxygen for growth are called ____.
- A) Thermophilic bacteria
 - B) Microaerophilic bacteria
 - C) Facultative anaerobic bacteria
 - D) Mycobacteria
- 79)** Which of the following intermediates of TCA cycle act as amino acid precursors?
- A) Oxaloacetic acid
 - B) Succinic acid
 - C) Citric acid
 - D) Acetyl CoA
- 80)** Which one of the following mutagens act only on replicating DNA?
- A) Ethidium bromide
 - B) Nitrosoguanidine
 - C) Acridine orange
 - D) None of above
- 81)** Mycotoxins are formed during the end of ____.
- A) Lag phase
 - B) Log phase
 - C) Death phase
 - D) Stationary phase

- 82)** Which one of the following mineral elements play an important role in biological nitrogen fixation?
- A) Copper
 - B) Magnesium
 - C) Zinc
 - D) Molybdenum
- 83)** In gram positive and gram negative bacteria the electron transport contains ----
- A) Naphthquinone
 - B) Plastoquinone
 - C) Ubiquinone
 - D) Both A and B
- 84)** Multiple antibiotic resistance is mediated by ____
- A) Episome
 - B) Plasmid
 - C) Colplasmid
 - D) Both B and C
- 85)** The major constituents in agar are ____
- A) Fats
 - B) Aminoacids
 - C) Polysaccharides
 - D) Polypeptides
- 86)** The following organisms have been proposed as sources of single cell protein ----
- A) Bacteria
 - B) Yeasts
 - C) Algae
 - D) All the above

- 87)** Biological Oxygen Demand (BOD) is a measure of _____
- A) Industrial wastes poured into water bodies
 - B) Extent to which water is polluted with organic compounds
 - C) Amount of carbon monoxide inseparably combined with hemoglobin
 - D) Amount of oxygen needed by green plants during night
- 88)** Example of anaerobic medium _____
- A) Wilson blair medium
 - B) Mac conkey broth
 - C) Robertson's cooked meat medium
 - D) EMB agar
- 89)** The Bacteria move in response to magnetic field is _____
- A) Spirochets
 - B) Treponema
 - C) Aquaspirillum Magnetotacticum
 - D) None of these
- 90)** Which of the following monosaccharides is not an aldose?
- A) Ribose
 - B) Glucose
 - C) Fructose
 - D) Glyceraldehyde
- 91)** Virulent factor in pneumococcus is _____
- A) Cell wall
 - B) Capsule
 - C) Mesosomes
 - D) Endotoxins

- 92)** Peptone water medium is an example for _____
- A) Synthetic medium
 - B) Semisynthetic medium
 - C) Differential medium
 - D) None of these
- 93)** Electron microscope gives magnification upto _____
- A) 100 X
 - B) 2,000 X
 - C) 50,000 X
 - D) 2,00,000 X
- 94)** The best example for symbiotic association is _____
- A) E.coli in intestine of man
 - B) Lichens
 - C) Normal flora of skin
 - D) All of the above
- 95)** Which one of the following is an operating system?
- A) MS-office
 - B) MS-VMware
 - C) Oracle
 - D) UNIX
- 96)** Assembly languages are written with the help of _____
- A) Mnemonics
 - B) Proteomics
 - C) Genomics
 - D) None of the above

- 97) _____ term used to define all input and output devices in a computer system.
- A) Software
 - B) Monitor
 - C) Shared resources
 - D) Hardware
- 98) _____ is a structural database.
- A) PDB
 - B) PIR
 - C) DDBJ
 - D) PubMed Central
- 99) Under the _____ branch total set of proteins are studied using computational and experimental techniques.
- A) Pharmacogenomics
 - B) Proteomics
 - C) Chemoinformatics
 - D) Modelling
- 100) Reading of a barometer going down is an indication of
- A) Snow
 - B) Storm
 - C) Intense heat
 - D) Rainfall



Rough Work