S.NO	Questions	Choices
1.	Batch fermentation is also called	1. Sub-merger system 2. Fed-Batch system 3. Open system 4. Closed system
2.	_____ is the process of converting non carbohydrates precursor to glucose or glycogen	1. glycogenesis 2. Gluconeogenesis 3. Glucogenesis 4. Glycolysis
3.	Amino acid residue which is most likely to be found in the interior of water-soluble globular proteins is	1. Aspartic acid 2. Histidine 3. Valine 4. Threonine
4.	The three-dimensional structure (native conformation) of proteins is determined primarily by	1. The other proteins with which it forms a complex 2. Molecular chaperons 3. Its amino acid sequence 4. Noncovalent interactions.
5.	Identify the category of drug which acts to prevent blood from clotting:	1. Analgesic 2. Anticoagulant 3. antibiotic 4. antidiuretic
6.	Lipids are important constituents of	1. ribosome 2. ECM 3. cytosol 4. biological membrane
7.	The length of an alpha-helix composed of 36 amino acid residues is	1. 360 Å 2. 54 Å 3. 27 Å 4. 10 Å
8.	During the biosynthesis of urea in the urea cycle, the two nitrogen atoms are derived from	1. Free ammonium group and aspartate 2. One nitrogen atom is derived from citrulline and one from glutamate 3. Two free ammonium groups 4. Both nitrogen atoms are derived from arginine
9.	Which of the gases mentioned below is most polar?	1. Nitrogen 2. Hydrogen sulfide 3. Oxygen 4. Carbondioxide
10.	Which one of the following amino acid residues is specifically recognised by chymotrypsin during peptide bond cleavage?	1. Val 2. Asp 3. Phe 4. Leu
11.	The rate-limiting step of glycolysis is catalyzed by	1. Phosphofructokinase-I 2. Pyruvate kinase 3. Hexokinase 4.Glyceraldehyde-3-phosphate dehydrogenase

12.	Adenosine triphosphate is a type of	1. Nucleoside 2. Nucleotide 3. Steroid 4. Nucleic acid
13.	Which of the following is a non-reducing sugar?	1. Sucrose 2. Lactose 3. Maltose 4. Fructose
14.	Pantoprazole	1. is used for treatment of allergic rhinitis 2. inhibits the release of histamine from mast cells 3. reduces gastric acid secretion 4. prevents bronchoconstriction due to histamine
15.	When central nervous system depressants are prescribed which of the following should NOT be ingested at the same time?	1. milk 2. coffee 3. alcohol 4. aspirin
16.	Which of the following is the appropriate route of administration for insulin?	1. Intramuscular 2. Intradermal 3. Intravenous 4. Subcutaneous
17.	Which one of the following is not a route of administration?	1. Intravenous (IV) 2. Oral 3. Topical 4. Dissolution
18.	A rectal suppository is used to treat a fever. This would represent what type of drug delivery?	1. Parenteral and local 2.

		Parenteral and systemic 3. Enteral and local 4. Enteral and systemic
19.	Majority of drugs cross biological membranes primarily by:	1. Passive diffusion 2. Facilitated diffusion 3. Active transport 4. Pinocytosis
20.	Bioavailability of drug refers to:	1. Percentage of administered dose that reaches systemic circulation in the unchanged form 2. Ratio of oral to parenteral dose 3. Ratio of orally administered drug to that excreted in the faeces 4. Ratio of drug excreted unchanged in urine to that excreted as metabolites
21.	Due to the nature of biological membranes, drugs with the following properties are more likely to cross most membrane barriers	1. ionized and lipophilic 2. ionized and hydrophilic 3. nonionized and lipophilic 4. nonionized and hydrophilic
22.	If it takes 5 mL of 1.4 M NaOH to neutralize 150 mL of HCl with an unknown concentration, what was the original concentration of the acid?	1. 0.14 M 2. 0.014 M 3. 0.047 M 4. 0.47 M
23.	Fluidity of phospholipid bilayer is increased by	1. saturated fatty acids tails 2. pH 3. unsaturated fatty acid tails 4. cholesterol
24.	The 2 stereoisomers that are mirror images of each other and are non superimposable.	1. Constitutional isomers 2. Diasteriomers 3. Enantiomers 4. Meso compounds
25.	What type of molecules form micelles?	1. nonpolar molecules 2. amphipathic molecules

		3. charged molecules 4. polar molecules
26.	Which of the following is true about hydrogen bonds?	1. Polar uncharged molecules are soluble in water because they can form hydrogen bonds with water molecules. 2. Hydrogen bonds are longer and stronger than covalent bonds. 3. The geometry of a water molecule results in the equal sharing of electrons between the hydrogen and oxygen. 4. Hydrogen bonds must involve at least one water molecule.
27.	What are anomers?	1. An equimolar mixture of the D and L stereoisomers of an optically active compound 2. Two organic compound that are covalently bound to a protein and is essential to its activity 3. Two stereoisomers of a given sugar that differ only in the configuration about the carbonyl carbon atom 4. Two stereoisomers differing in configuration at one asymmetric center, in a compound having two or more asymmetric centres.
28.	A solution of sodium hydroxide (NaOH) has a pH of 10. A 10 mL of this solution is mixed with 990 mL of water. The pH of the diluted solution is closest to	1. 8 2. 9 3. 11 4. 12
29.	Which of the following is a lipd?	1.Riboflavin 2.Thiamine 3.Ubiquinone 4.Phospholipase
30.	Which of the following biochemical reactions is most commonly utilized in living cells to propagate intracellular signals?	1. Methylation 2. Decarboxylation 3. Acylation 4. Phosphorylation
31.	Which of the following amino acids have 2 chiral centres each?	1.Pro, Arg 2.Ile, Thr 3.Met, Cys 4.Leu, Ile
32.	Glycogen and cellulose are	1.Helical structures but with different degree of helicity. 2.Helical and sheet like structures respectively 3.sheet structures. 4.Helical but glycogen is extensively branched molecule
33.	Which of the following is a metabolic derivative of cholesterol?	1. dolichol 2.ubiquinone 3.vitamin E 4. vitamin D
34.	The combination of an amino alcohol, fatty acid and sialic acid forms	1.sphingosine 2. sphingomyelin 3. ganglioside 4. ceramide
35.	Which of the following functional groups would make a carbon-based compound the least polar?	1.Methyl 2. Carboxyl 3. Amino 4. Phosphate
36.	The product(s) resulting from the hydrolysis of lactose is/are	1. ß - D -Glucose only 2. alpha - D -Glucose only 3. a mixture of alpha - D -Glucose and ß - D -Galactose 4. a mixture of D-Glucose and L-Glucose
37.	Which of the following is a saturated fatty acid ?	1.Oleic acid 2.Palmitoleic acid 3.Linoleic acid 4.Palmitic acid .
38.	Which of the following is the heaviest amino acid?	1.Cysteine 2. Tryptophan 3. Phenylalanine

		4.Isoleucine
39.	---------- is not a coenzyme for pyruvate dehydrogenase complex .	1.NAD 2.lipoate 3.PLP 4.coenzyme A
40.	Riboflavin is a coenzyme in the reaction catalysed by the enzyme:	1.Acyl CoA synthetase 2.Acyl CoA dehydrogenase 3.thiolase 4.Enoyl CoA hydratase
41.	Serine cannot be accomodated in alpha helix due to	1. flexible conformation 2. bulkiness and shape 3. imine group 4. electrostatic repulsion
42.	Silk fibroin consists of polypeptide chains arranged in	1. alpha helix 2. triple helix 3. beta pleated sheet 4. random conformation
43.	Hydrogenation of vegetable oil	1. decreases melting point 2. increases melting point 3. decreases solubility 4. increases solubility
44.	Which one of the following is affected when you treat the protein with detergents?	1. Hydrogen bonding 2. Hydrophobic interactions 3. ionic interactions 4. disulphide linkages
45.	Why plant transports sugar in the form of sucrose but not as monosaccharides?	1. Sucrose is non-reactive 2. Sucrose contains glucose and fructose 3.Sucrose is soluble 4.

		Sucrose contains more energy
46.	Which one is said to have small dimension among the same molecular weight polysaccharides?	1.Cellulose 2.Chitin 3.Peptidoglycan 4.Glycogen
47.	Why is glucose stored in the form of starch in plants?	1. It has a helical structure 2. It contributes to low osmolarity 3. It contains more energy 4. It is less soluble
48.	Peptide bonds are	1. partial double bond and planar 2. planar and nonpolar 3. partial double bond, non polar and planar 4. partial double bond, polar and planar
49.	The disulphide bonds are involved in quarternary structure of	1. hemoglobin 2.silk fibroin 3. collagen 4. keratin
50.	The characteristic that all lipids have in common is	1. they are all made of fatty acids and glycerol 2. they contribute to high calorie in the diet 3. they have low solubility in water 4. they are all acidic when mixed with water
51.	Which of the following compounds is not an isoprenoid?	1. Vitamin A 2. Vitamin C 3. Vitamin E 4. Vitamin K

52.	Conversion of amino acid nitrogen into urea by the liver for excretion normally involves all the following enzymes except:	1. Transaminase 2. Glutamate dehydrogenase 3. alpha ketoglutarate dehydrogenase 4. carbamoyl phosphate synthase I
53.	Which fatty acid would have the lowest melting temperature?	1. stearic acid 2. palmitic acid 3. arachidic acid 4. myristic acid
54.	Statins are effective in lowering plasma cholesterol levels because they	1. slow the rate of cholesterol uptake from plasma into the cell 2. increase the rate of synthesis of cholesterol inside the cell 3. inhibit the activity of a key enzyme in the cholesterol biosynthesis 4. decrease the absorption of cholesterol from the gut
55.	The most reduced compound formed in glycolysis is	1. pyruvate 2. NADH 3. lactate 4. dihydroxyacetonephosphate
56.	Which of the following is an essential aminoacid?	1. Aspartic acid 2. Glutamic acid 3. Glycine 4. Threonine
57.	Maltose is composed of	1. Galactose and glucose

		2. Glucose and glucose 3. glucose and fructose 4. galactose and ribose
58.	Why is TCA cycle considered as the central pathway of metabolism of the cell?	1. All other metabolic pathways depend upon it 2. Its intermediates are commonly used by other metabolic reactions 3. It occurs in the centre of the cell 4. It occurs in mitochondria
59.	Arginine is represented by the letter	1. A 2. H 3. Q 4. R
60.	Pyruvic acid is the end product of	1. electron transport chain 2. phosphate metabolism 3. glycolysis 4. fat metabolism
61.	The chemical reactions which involve break down of molecules are called as	1. catabolic reactions 2. anaabolic reactions 3. emergy providing reactions 4. metabolic reactions
62.	Which of the following processes does not involve cytochrome c?	1. Apoptosis 2. Oxidative phosphorylation

		3. Electron transport 4. Photophosphorylation
63.	Which one of the following has buffering capacity at biological pH?	1. Histidine 2. Arginine 3. Cysteine 4. Tryptophan
64.	What type of bond is formed between the hydroxyl group of one nucleotide and the phosphate group of an adjacent nucleotide, forming the sugar-phosphate backbone of DNA?	1. Glycosidic bond 2. Hydrogen bond 3. Ester linkage 4. Phosphodiester bond
65.	Polyprotic acids such as H3PO4, can act as acid-base buffers because	1. they combine with polyprotic bases 2. their concentration is kept low 3. their pH values are around 7 4. they can act as buffer at pH values around any of their pKa's.
66.	According to Henderson-Hasselbalch equation, when is the pKa of an acid numerically equal to pH?	1.When it is fully ionized 2.When the molar concentration of an acid is double times than that of a base 3. When the acid is half ionized 4. When the molar concentration of a base is double times than that of an acid
67.	Which of the following pair is said to be enantiomers?	1. D- glucose and L- glucose 2. D-galactose and D-glucose 3. D-glucose and D-fructose 4.

		D-glucose and L-galactose
68.	Which one of the following is a glycolipid?	1. Sphingomyelin 2. Lecithin 3. Cholesterol 4. Cerebroside
69.	A ds DNA has 30% thymine. The percentage of cytosine is	1. 20% 2. 30% 3. 15% 4. 70%
70.	Metabolic precursor of serine, glycine and cysteine is	1. pyruvate 2. alpha-ketoglutarate 3. oxaloacetate 4. 3-phosphoglycerate
71.	What will be the average molecular weight of protein containing 200 aminoacids?	1. 110 Da 2. 22,000 Da 3. 2200 Da 4. 20,000 Da
72.	During aerobic respiration, carbohydrates are ultimately broken down into	1. acetyl coA 2. pyruvic acid 3. lactic acid 4. CO2

73.	Which one of the following R group of aminoacids is hydrophobic?	1. Tryptophan 2. glutamate 3. lysine 4. arginine
74.	Which one of the following aminoacid has sulphhydryl group in it?	1. Methionine 2. Cysteine 3. Cystine 4. Ornithine
75.	Identify the net charge of the peptide AWESRE at pH 7.	1.0 2.-1 3.+1 4.-2
76.	In the absence of oxygen, the end-product of glycolysis, _____, is used in fermentation.	1. lactate 2. pyruvate 3. ethanol 4. hydrogen
77.	If oxygen is available, pyruvic acid is used to produce _____.	1. citric acid 2. lactate 3. ethanol 4. acetyl CoA
78.	Positive Regulation = _____ binds to regulatory site to stimulate transcription of genes.	1. activator 2. inducer 3. repressor 4.

		inhibitor
79.	Repressor binding site = _____.	1. inducer 2. promoter 3. regulator 4. operator
80.	_____ is defined as a network of operons under the control of a common regulatory protein in a global regulatory network.	1.operon 2.stimulon 3.modulon 4.regulon
81.	In the enzyme-catalyzed reaction shown below, what will be the effect on substances A, B, C, and D of inactivating the enzyme labeled E2? A ---(E1)---> B ---(E2)---> C ---(E3)--->	1. A, B, C, and D will all still be produced 2. A, B, and C will still be produced, but not D 3. A and B will still be produced, but not C or D 4. A will still be produced, but not B, C, or D
82.	If G has full rank, i.e., _____, at least one square submatrix exists that can be used for the inversion calculations.	1. rank(G) = F 2. rank(G) = J 3. rank(G) = R 4. rank(G) = K
83.	The degree of freedom in the set of algebraic equations given by _____, where J, F and K have the usua meaning as used in metabolic flux analysis.	1. F = J + K 2. K = J – F 3. J = F – K 4. J = K - F
84.	Under what circumstances should you not use the method of initial rates to determine the rate law for a reaction?	1. Very fast reactions 2.

		Colored reactions 3. Clear, colorless reactions 4. Very slow reactions
85.	By what factor would the rate increase when a second order reactant's concentration is tripled?	1. 3 2. 9 3. 2 4. 6
86.	What is a half-life?	1. The time it takes for one-half of the products to be produced 2. The time it takes for one-half of the limiting reagent to be consumed 3. Half of the time the reaction takes to go to completion 4. 40 years old
87.	What happens to the rate of a reaction when more catalyst is added to a reaction that is zero order?	1. Increases 2. Nothing 3. Decreases 4. Cannot be predicted
88.	Void volume refers to the	1. total volume of eluent in the column the remainder being taken up by the packing material 2. the volume of the column between the point at which solvents are mixed and the beginning of the column 3. the time required for the gradient to reach the column 4. the volume of solvent contained in a liquid chromatographic column
89.	The Kjeldal method is used for the determination of which mineral nurient?	1. Nitrogen 2. Sulphur

		3. Oxygen 4. Phosphorus
90.	Which of the following technique may be used to determine the location of a specific protein inside a cell?	1. bright-field microscopy 2. phase-contrast microscopy 3. GFP-tagging fluorescent microscopy 4. scanning electron microscopy
91.	In reverse phase chromatography, the stationary phase is	1. non-polar 2. either non-polar or polar 3. polar 4. mid-polar
92.	In gas chromatography, the basis for separation of the components is the difference in	1. Molarity 2. Molecular weight 3. Partition coefficients 4. Conductivity
93.	Water is generally a good solvent for polar molecules and a poor solvent for nonpolar molecules. These solvent properties are best explained by	1.the density of solid water being less than the density of liquid 2.the ability to form intermolecular hydrogen bonds 3.the high density of liquid water relative to polar solvents 4.high surface tension
94.	X ray crystallography is a form of which scattering	1. Non elastic 2. rigid 3. Inelastic 4. elastic
95.	Fluorescent imaging of thick, living specimens is best accomplished by	1. confocal scanning microscopy. 2. immunofluorescence microscopy. 3. differential interference microscopy 4. phase-contrast microscopy.
96.	If a researcher is studying a large protein, what process should be performed before introducing the protein into a mass spectrometer?	1. PCR 2. isotope analysis 3. protease treatment 4. chromatography
97.	Counter stain used in gram staining is:	1.safranin 2.crystal violet 3.acetocarmine 4.carbolfuschin
98.	The chlorophyll molecules used by eukaryotes and cyanobacteria absorb radiant energy in the _____ portion(s) of the visible spectrum	1. red 2. green 3. red and blue 4. green and ultraviolet
99.	Charged molecules are separated based on varying rates of migration through a solid matrix when subjected to an electric field. This technique is known as	1.autoradiography 2.gel electrophoresis 3.photoreactivation 4.blotting
100.	If you wanted to observe the surface of a microvillus on an intestinal epithelial cell, what type of microscopy would you use?	1. bright-field 2. fluorescence 3. scanning EM 4. phase-contrast
101.	Which of the following gases is unsuitable for use as a GC carrier gas?	1. Nitrogen 2. Oxygen 3. Helium 4. Hydrogen
102.	Addition of ammonium sulphate to protein solution will	1.It will not precipitate proteins 2.Precipitate proteins

		3.Precipitate carbohydrates 4.Precipitate Nucleic acids
103.	Starting from a glucose residue coming from glycogen, how many net ATP molecules will be formed in an aerobic glycolysis ?	1. 2 2. 4 3. 1 4. 32
104.	------ is a prosthetic group in succinate dehydrogenase .	1. ATP 2. FAD+ 3. NADP+ 4. NAD+
105.	In transmission electron microscopy, election opacity is greatly enhanced by treating the specimen with	1. Basic fuchsin 2. Ferrous ammonium sulfate 3. Uranium acetate 4. Sodium chloride
106.	A drug which prevents uric acid synthesisby inhibiting the enzyme xanthineoxidaseis	1. Probenecid 2.Sulfinpyrazone 3. Allopurinol 4. Aspirin
107.	An ion exchange resin is composed of	1.Polymeric beads only 2.long aliphatic chains 3.ionic functional groups 4.non-ionic dyes
108.	---------- is a high energy bond.	1. Phosphoanhydride bond 2. Ether bond 3. Phosphodiester bond 4. Phosphoester bond
109.	Why was it unexpected that transporter proteins are required for transmembrane fatty acid transport?	1.because these molecules are too small for their diffusion to be impeded by membranes 2.because it is the cytosolic fatty acid binding protein–fatty acid complex that is the actual transported complex 3.because these molecules are sufficiently hydrophobic to diffuse across membranes 4.because triglycerides carried by lipoproteins were thought to be the only source of fatty acids in the circulation
110.	The component peaks of a gas chromatogramare quantitatively analyzed on the basis of	1. the solvent used for extraction 2. peak area 3. ratio of retention time to peak area 4. ratio of peak height to peak area
111.	Which of the following drugs has an anti-inflammatory action?	1. Codeine 2. Pethidine 3. Meloxicam 4. aracetamol
112.	The correct order for the basic features of a mass spectrometer is	1. ionization, acceleration, deflection, detection 2. acceleration, deflection, detection, ionization 3. acceleration, deflection, ionization, detection

		4. acceleration, ionization, deflection, detection
113.	Which complex in the electron transport chain of oxidative phosphorylation is not a proton pump?	1. NADH dehydrogenase 2. Cytochrome oxidase 3. ubiquinone cytochrome c oxidoreductase 4. succinate dehydrogenase
114.	What is lyophilisation?	1.Hot air drying 2.Mixing process which involves filteration 3.Freeze drying 4. Boiling
115.	Which of the following is not a white blood cell?	1. Basophil 2. Eosinophil 3. Lymphocyte 4. Reticulocyte
116.	**The G+C content of bacteriophage 13 dsDNA is 68%.What will be the A+U content of its mRNA?**	1. about 68% 2. about 34% 3. about 32% 4. about 16%
117.	The chromatography in which separation occurs based on size is	1.reverse phase chromatography 2.gel exclusion chromatography 3. affinity chromatography 4. ion exchange chromatography
118.	Higher efficacy of a drug necessarily confers	1. greater safety 2. therapeutic superiority 3. capacity to produce more intense response

		4. cost saving
119.	Emission without a change in spin multiplicity	1.is called phosphorescence 2.is called fluorescence 3.is spin forbidden 4.involves an intersystem crossing
120.	The dye used to track the migration of proteins in the PAGE is	1. Bromo phenol blue 2. Beta mercaptoethanol 3. Silver Stain 4. Coomassie Brilliant Blue
121.	The main advantage of fluorescence over UV-Vis spectroscopy is	1.its compatibility with most analytes 2.its compatibility with separation techniques 3.its sensitivity 4.specificity
122.	The effectiveness of a solvent can be measured by the	1.Distribution coefficients 2. Solubility 3. Diffusivity 4.polarity
123.	The rate of migration of a protein in a SDS-polyacrylamide gel is not influenced by	1.strength of the electric field 2.charge of the protein 3.pore size of the gel 4.size of the protein
124.	What is the full form of SEM?	1. Sonographic Electron Microscope 2. Semi Electron Microscope 3. Somatic Electronic micrograph 4. Scanning Electron Microscope
125.	MCA has proven very useful for coupling local enzymatic kinetics with systemic metabolic _____.	1. concentrations 2. fluxes 3. intermediate 4. behavior
126.	When a molecule of pyruvic acid is subjected to anaerobic oxidation, there is	1. loss of 2.5 molecules of ATP 2. loss of 5 molecules of ATP 3. gain of 2 molecules of ATP 4. gain of 1.5 molecules of ATP
127.	Starch and glycogen are polymers of	1. alpha-D-glucose 2. alpha-L-glucose 3. glucose-1-phosphate 4. beta-D-glucose
128.	The terminal electron acceptor during mitochondrial respiration is	1. FAD+

		2. ATP 3. NAD+ 4. O2
129.	In ice, each water molecule forms hydrogen bonds with four other water molecules, as compared to liquid water in which each water molecule forms hydrogen bonds with 3.4 other water molecules. A consequence of this is that	1. Ice is denser than water 2. Water has a relatively high melting point 3. Water turning into ice is a spontaneous reaction because more hydrogen bonds are involved in ice 4. Water has a relatively low boiling point
130.	In ATP synthase, F_o acts as	1. ATPase 2. Hydrogen ion channel 3. Electron carrier 4.Proton pump
131.	Two proteins interact with each other	1. along their entire length of polypeptide chain 2. at specific binding domains 3. by forming a bond between n terminus of one protein to c terminus of another protein 4. only at their cysteine residues
132.	Identify the term used to describe an injection that is given into the vein of an animal :	1. S u b c u t a n e o u s 2. Intravenous 3. intramuscular 4. Intradermal
133.	In a given nucleic acid, G+A is not equal to C+T content. This indicates that the sample is	1. AT rich 2. GC rich 3. ssDNA 4. dsDNA
134.	Which one of the following is the oxidation reaction in the given equation? Glucose + DNSA ----- gluconic acid + 3- amino-5, nitro salicylic acid	1. Conversion of DNSA to 3- amino-5, nitro salicylic acid 2. Conversion of glucose to gluconic acid 3. Conversion of glucose to 3- amino-5, nitro salicylic acid 4.

		Conversion of DNSA to gluconic acid
135.	Polymerization reaction in cellular metabolism leads to _____.	1. formation of macromolecules from building blocks 2. production of 12 precursor metabolites needed for biosynthesis 3. production of building blocks 4. formation of building blocks from macromolecules
136.	What does a catalyst do to the free energy change of a reaction?	1. Increases it 2. Decreases it 3. Alters it unpredictably 4. Absolutely nothing
137.	What is an intermediate?	1. A substance that is both created and consumed during a chemical reaction that does not appear in the overall balanced reaction 2. A substance that speeds up the rate of a reaction without being changed 3. A reactant 4. A product
138.	Buffers has the ability To	1. Change the pH of netural solution 2.resist change in pH 3.change pH of acidic solution 4.change pH of basic solution
139.	Which of the following is the Arrhenius equation?	1.rate = k [A] [B] 2.PV = nRT 3.k = ln 2 / t 4. k = A e-Ea / RT
140.	An electron transport chain (ETC) couples electron transfer between	1. Proton and electron 2. Electron donor and electron acceptor 3. cell and cell wall 4. CO2 and H2O
141.	A prodrug is	1. The prototype member of a class of drugs 2. The oldest member of a class of drugs 3.

		An inactive drug that is transformed in the body to an active metabolite 4. A drug that is stored in body tissues and is then gradually released in the circulation
142.	Which of the following separation method is suited method for a protein sample with large differences in molecular mass	1. salting out process 2. rate zonal centrifugation 3. density gradient centrifugation 4. dialysis
143.	Which of the following statements regarding mass spectrometry is WRONG?	1. In a normal mass spectrometer, electron impact causes a molecule to lose an electron and become a molecular radical cation which decomposes into fragment cations and radicals. 2. Only cations can be detected by a normal mass spectrometer. 3. A compound whose molecules contain just one bromine atom shows two molecular ion peaks of similar intensity, one at M+ and M+2 position 4. Molecular ion peaks always have even-numbered values of m/z.
144.	Which one of the following amino acids has a higher propensity for *cis* peptide bond formation?	1. Glycine 2. Histidine 3. Cysteine 4. Proline
145.	Within the ribosome, the formation of peptide bonds is catalyzed by:	1. aminoacyl-tRNAsynthetase 2. the tRNA itself 3. an RNA molecule in the large ribosomal subunit 4. a peptidase in the small ribosomal subunit
146.	Middle lamella of a plant cell is composed of	1. Cellullose 2. Hemicellulose 3. Pectinic acid 4. Glutamic acid
147.	The primary building blocks of all biomembranes is	1. Phospholipids 2. Complex carbohydrates 3. Nucleic acids

		4. Amino acids
148.	The transporter GLUT1 transports ----------	1.Water 2.Ions 3.Protein 4.Glucose
149.	A cross between red-flowered and white-flowered snapdragon plants produced all pink-flowered plants in F1. This is an example of ----------	1.Complete dominance 2.Incomplete dominance 3.Epistasis 4.Co-dominance
150.	The synthesis of fatty acids and phospholipids takes place in the ……	1. Smooth ER 2. Rough ER 3. Mitochondria 4. Ribosome
151.	Detoxification of hydrophobic chemicals such as pesticides and carcinogens takes place in ……	1. Rough ER of liver 2. Smooth ER of liver 3. Smooth ER of kidney 4. Smooth ER of spleen
152.	In population genetics, if p=0.2, what will be the value of q?	1. 0.2 2. 0.02 3. 0.8 4. Can't be calculated from the given information
153.	With two alleles, how many genotypes are possible?	1. Two 2. Three 3. Four 4. Five
154.	The …… molecule can move by passive (simple) diffusion across an artificial membrane	1.

	composed of pure phospholipid or of phospholipid and cholesterol	Calcium ion (Ca^+) 2. Sodium ion (Na^+) 3. Steroid 4. Glucose
155.	Aquaporin is specialized to transport …… across the membrane	1. Glucose 2. Water 3. Ions 4. Amino acids
156.	Which of the following is not a second messenger?	1. cAMP (3,5-cyclic AMP) 2. cGMP (3,5-cyclic GMP) 3. Epinephrine 4. IP3 (inositol 1,4,5-trisphosphate)
157.	GLUT1 is a …….	1. ATP powered pump 2. Cotransporter 3. Uniporter 4. Antiporter
158.	Rough endoplasmic reticulum is due to presence of ---------- over its cytosolic face	1. Carbohydrate molecules 2. Lysosomes 3. Protein molecules 4. Ribosomes
159.	Yeast Artificial Chromosomes must have	1.Telomeres and a Centromere 2.Telomeres and ORI Site 3.Centromeres and ORI site 4.Par A, Genes

160.	Nick translation is done by which enzyme	1.DNA Polymerase I 2.DNA Polymerase III 3.Alkaline Phosphatase 4.S1 Endonucleases
161.	Clones are defined as	1.Morphologivally identical organisms 2.Genetically identical organisms 3.Genetically identical and are asexually reproduced 4.Capable of dividing by binary fission
162.	Breakdown of foreign DNA is done by	1.Lysozymes 2.Robozymes 3.Endonucleases 4.Methylases
163.	K12 is the term applies to	1.Vitamin 2.*E. coli* 3.*Bacillus* 4.*Saccharomyces*
164.	An organism cloned based on inverse DNA is called as	1. ANDi 2. DOLLY 3. POLLY 4. MONKEY
165.	An enzyme used to add OH group to the DNA is	1. Alkaline Phosphatases 2. Polynucleotide Kinases 3. Terminal Nucleotidyl Transferases 4. Topoisomerases
166.	Co-factors used in DNA ligation process are	1. ATP and NAD 2. GTP and NAD 3. GTP and ATP 4. ATP
167.	Which one of the following vector can carry longest segment of DNA	1. YEP 2. YCP 3. YAC

		4. COSMID
168.	Hairpin loop DNA present in	1. cDNA synthesis 2. transcription 3. Post transcriptional Modifications 4. Bacteria
169.	Selfish DNA are otherwise called as	1. Recombinant DNA 2. FISH 3. Transposons 4. Chimeric DNA
170.	Gene gun is used to	1. Kill the unwanted genes 2. Introduce a gene in to ovum 3. Introduce a gene in Drosophilla 4. Introduce a gene in callus
171.	Which one of the following DNA posses cancerous properties	1. P1 elements 2. Mobile DNA 3. Okasaki Fragments 4. Ti Plasmid
172.	SS DNA is present in	1. Adenoviruses 2. M13 Virus 3. HIV 4. Retroviruses

173.	A commensal organism found in human colon is	1. *Escherchia* 2. *Bacillus* 3. *Amoeba proteus* 4. *Saccharomyces cereviceae*
174.	What was the first human genetic disease that was successfully treated with gene therapy?	1. SCID (ADA deficiency) 2. Sickle Cell anaemia 3. Diabetes 4. DownSyndrome
175.	Golden rice is a genetically modified crop plant where the incorporated genes are meant for biosynthesis of	1. Vitamine A 2. Beta Carotene 3. Vitamine B12 4. Gold particles
176.	Gene therapy for SCID disease in man involves the transfer of the gene for this enzyme	1. Beta-galactosidase 2.Thrombokinase 3. Adenosine deaminase 4. Phenylalanine hydroxylase
177.	Telomeric Sequence Found in	1.BAC 2.PAC 3.YAC 4.MAC
178.	First Genetically Modified organism generated was	1. Bacteria 2. Dolly 3. Arabidopsis 4. Saccharomyces

179.	Which of the following is obtained using processed mRNA molecules as a template?	1. rDNA 2. mtDNA 3. cDNA 4. BDNA
180.	Who Discovered Recombinant DNA Technology	1. Har Gobind Khorana 2. J D Watson 3. Stanley Cohen and Herbert Boyer 4. William Austbury
181.	which one of the following is a promoter sequence	1. TATATA 2. TATAAT 3. TTATTA 4. TTGATA
182.	PCR is used for	1.Digest DNA 2. Fragment DNA 3. Copying DNA and RNA 4. Copying tRNA
183.	Transcriptomes consist of	1. RNA 2. DNA 3. Protein 4. lysozyme
184.	DNA synthesis proceeds:	1. in the 5′ to 3′ direction 2. in the 3′ to 5′ direction 3.

		in both directions at once 4. from the centromeres to the telomeres
185.	What provides the energy for DNA polymerization?	1. The hydrolysis of ATP (releasing Pi) 2. The hydrolysis of GTP (releasing Pi) 3. The hydrolysis of incoming nucleoside triphosphates (releasing PPi) 4. No energy is obtained
186.	At a replication fork, the lagging strand is synthesized	1. continuously 2. discontinuously 3. first 4. when the leading strand is complete
187.	What powers the action of helicase at the replication fork, where it opens up the double helix?	1. DNA nucleotide hydrolysis 2. ATP hydrolysis 3. GTP hydrolysis 4. No hydrolysis
188.	What is the function of single-strand binding proteins in DNA replication?	1. They unwind a DNA double helix to form two separate, single strands 2. They bind to single-stranded DNA and assist in the re-formation of double-stranded DNA 3. They bind to single-stranded DNA and prevent the single-strands from re-forming base pairs 4. They bind to double stranded DNA and enhance the single-strands from re-forming base pairs
189.	What type of enzyme removes damaged DNA from the rest of the DNA molecule?	1. Polymerase 2.

		Nuclease 3. Primase 4. Ligase
190.	What type of enzyme fills in the gap after damaged DNA has been removed?	1. Polymerase 2. Ligase 3. Primase 4. Nuclease
191.	Who coined the term Molecular Biology	1. Gregor Mendel 2. Nirenbergh 3. William Austbury 4. Lamark Answer is Warren Weaver
192.	cDNA can be obtained from	1. any RNA's 2. Sn RNA 3. Unprocessed mRNA 4. Processed messenger ribonucleic acid
193.	Colinearity of gene and poly peptide is absent in	1. *E. coli* 2. *Bacillus* 3. *Saccharomyces* 4. T4 Phage
194.	Cell theory states that	1. Cells are organisms 2.

		Cells are tissues 3. cells can respire 4. cells are living materials
195.	UUU AAA CCC codons, does not codes for	1. Phenyl alanine 2. Lysine 3. Proline 4. Valine
196.	In plant cells the chloroplast, mitochondria and nucleus contain	1. DNA 2. Photosynthetic membranes 3. Endoplasmic reticulum 4. Golgi apparatus
197.	In what way are all cells alike?	1. They are round in shape 2. They are about a tenth of a millimeter in diameter 3. They store their genetic instructions in DNA 4. They require oxygen to live
198.	How long ago is it estimated that the common ancestor for all of life existed?	1. Between 350 and 380 thousand years ago 2. Between 3.5 and 3.8million years ago 3. Between 3.5 and 3.8billion years ago 4. Between 350 and 380 years ago
199.	Which of the following are prokaryotes?	1. Plants and animals 2. Animals and archaea

		3. Bacteria and archaea 4. Bacteria and fungi
200.	Which statement is NOT true of mitochondria?	1. Mitochondria have an inner and outer membrane 2. Mitochondria contain their own DNA 3. Mitochondria are thought to have originated from bacteria 4. Mitochondria are not present in plant cell
201.	At which site on the DNA of a gene does RNA polymerase release its newly made RNA?	1. Promoter 2. Template 3. Stop codon 4. Terminator
202.	What is the name of the subunit of bacterial RNA polymerase that recognizes the promoter of a gene?	1. Alpha helix 2. Beta helix 3. Beta polymerase 4. Sigma Factor
203.	In eukaryotes, the initiator tRNA always carries which amino acid?	1. Glycine 2. Alanine 3. Methionine 4. Lysine
204.	At what site does the charged initiator tRNA first bind on the ribosome?	1. A site 2. P site 3. C site 4.

		E site
205.	Which statement is false?	1. The genetic code contains three stop codons 2. Stop codons are not recognized by tRNAs 3. Release factors bind to stop codons 4. Methionine is a start codons
206.	In bacteria when transcription regulators bind to regulatory DNAsequences close to where RNA polymerase binds, they:	1. activate transcription of the gene 2. repress transcription of the gene 3. activate or repress transcription of the gene depending upon where they are located relative to the promoter 4. activate or repress transcription of the gene depending upon their concentration
207.	Secondary immune organs are the principal sites where ____.	1. B cells rearrange immunoglobulin genes 2. T cells rearrange T-cell receptor genes 3. most antibody secretion by plasma cells takes place 4. B and T cells initially encounter foreign antigen
208.	Western blotting is used to detect	1. carbohydrates 2. lipids 3. proteins 4. DNA
209.	The first clinical gene therapy was given to a 4-year old girl (Ashanti DeSilva) with _____ deficiency, which is an autosomal recessive metabolic disorder.	1. (A) Aldolase A (ALDOA) 2. (B) Adenosine deaminase (ADA) 3. (C) Galactose epimerase (GALE) 4. (D) Leukocyte adhesion (LAD)

210.	Ribose sugar is found in	1.DNA 2.RNA 3.cDNA 4.Protein
211.	More than 1 sets of primers were used in which type of PCR	1.Long PCR 2.Multiplex PCR 3.RT PCR 4.Hot Start PCR
212.	In ---------- signaling, the signaling molecules act only locally and the signalling molecules must not be allowed to diffuse too far	1. Paracrine 2. Autocrine 3. Endocrine 4. Neurone
213.	Choose the catabolic plasmid from the plasmids given below	1. pUC 18 2. pBR 322 3. pBIN 19 4. pTOL
214.	Restriction enzyme was discovered first in _____	1. *E coli* 2. *Bacillus amyloliquefacians* 3. *Haemophilus influenza* 4. *Haemophilus aegypticus*
215.	In population genetics, *p* represents the frequency of ……..	1.Dominant allele 2.Recessive allele 3. Both, dominant and recessive alleles 4. Genotype
216.	In Hardy-Weinberg Equation, p^2 represents	1. The proportion of population that is homozygous for the second allele 2. The proportion of population that is homozygous for the first allele 3.

		The proportion of population that is heterozygous 4. The proportion of population that is homozygous for the third allele
217.	Nucleotides are linked by--------- in nucleic acids	1. hydrogen bonds 2. Phosphodiester bond 3. peptide bonds 4. ionic bonds
218.	What does depurination refer to?	1. The loss of A or G bases from DNA 2. The loss of T or C bases from DNA 3. The breaking of the DNA backbone 4. Addition of non-specific inosine bases
219.	In …….. signaling, the signaling molecule travels the shortest distance	1.Autocrine 2.Paracrine 3.Endocrine 4.Neurone
220.	The signal receptors are made up of ---------- molecules	1. Lipid 2. Carbohydrate 3. Protein 4. Glycosaminoglycans
221.	The transporter aquaporin is specialized to transport --------	1. Water 2. Ions 3. Protein 4. amino acids

222.	Uniporter transport ----------	1.A single type of molecule down its concentration gradient 2.A single type of molecule against its concentration gradient 3.Two types of molecules down their concentration gradient 4.Two types of molecules against their concentration gradient
223.	All the lysosomal enzymes work most efficiently at ……	1. Acidic pH 2. Basic pH 3. Neutral pH 4. slightly alkaline pH
224.	The drug binds to a receptor and no intrinsic activity is	1. Agonist 2. Partial agonist 3. Antagonist 4. Mixed agonist antagonist
225.	To begin transcription, RNA polymerase recognizes nucleotide sequences in what region of the DNA?	1. Promoter region 2. Template region 3. G-C rich region 4. Terminator region
226.	DNA ligases are used to	1. Make phospho-di-ester bonds 2. Make Hydrogen Bonds 3.Binds viral DNA into Bacterial DNA 4. Used to join vector DNA into Genomic DNA
227.	Nylon membrane is used in Northern Blotting because	1. It is negatively charged 2. It is Positively charged 3. It is inert 4. it has binding capacity

228.	Microbiologist who demonstrated that DNA was the genetic material.	1. Oswald Avery 2. Herbert Boyer 3. Rosalind Franklin 4. Barbara McClintock
229.	VNTR = Variable number of tandem repeats, the DNA repeating sequences, used in DNA fingerprinting will be same only in	1. Mother-Son 2. Siamese twins 3. Dizygotic Fraternal Twins 4. Monozygotic twins
230.	Gel electrophoresis separates DNA according to their	1. molecular size 2. gene of interest 3. colour 4. electric charge
231.	In incomplete dominance, the phenotype of the F1 offsprings will be ----------	1. Similar to the male parent 2. Similar to the female parent 3.Offspring with a blending of the parental traits 4. Distorted and contrasting phenotype
232.	Removal of the bursa of Fabricius from a chicken results in	1. A markedly decreased number of circulating T lymphocytes 2. Anemia. 3. Delayed rejection of skin graft 4. Low serum antibodies
233.	Which of the following classes of lipid are found in biomembrane?	1. Phosphoglycerides 2. Sphingosine

		3. Triacylglycerol 4. Ubiquinone
234.	Which order of reaction has a half-life that does not depend on the concentration of the reagents?	1. First 2. Second 3. Third 4.Zero
235.	Economic Design of a process plant ultimately means	1. Reduced cost 2. Reduced investment 3. Reduced cost and more profits 4. Reduced investment and more profits
236.	Which one of the follwoing is not the unit of radioactivity?	1. Rad 2. Becquerel 3. Curie 4.Meter
237.	If the theoritical plate number is increased form 100 to 1200 by how much will the resolution be increased	1.By a factor of 5 2.By a factor of 10 3. By a factor of 100 4. By a factor of 50
238.	The equation for the elution volume of a solute in an effluent is (where V is the elution volume of a substance , V0 void volume, kD distribution constant and Vi internal water volume)	1. $V = V_0 + k_D V_i$ 2. $V = V_0/V_i$ 3. $V = V_0 - k_D V_i$ 4. $V/V_0 = k_D V_i$
239.	Example of filter for continuous mode of filtration	1. Plate and frame 2.

		Spiral wound 3. Rotary vacuum 4. Tubular
240.	A system which require less solvent and produces a more concentrated extract phase, is desired with a	1. large distribution coefficients 2. small distribution coefficients 3. very small distribution coefficients 4. constant distribution coefficients
241.	For the extraction operation, the selectivity should be	1. > 1 2. < 1 3. 1 4. Zero
242.	Which type of liquid liquid extraction is efficient .	1. Multistage counter current 2. Multistage cross current 3. Multistage co current 4. Single stage
243.	When the feed and solvent are fully miscible, is extraction still possible?	1. Yes, since only the difference in solubility of the solute in the two solvent matters. The higher the difference in solubility, the better the separation. 2. No. In this case there will be only one phase after the settler insted of two. No extract or raffinate phases can be formed. 3. It depends on the density difference between the two liquids. If this difference is higher than 25%, extraction is possible. 4. No, extraction is not possible anymore, since if the two liquids are fully miscible, the solute has also the same solubility in both liquids.

244.	---------takes a liquid stream and separates the solute or suspension as a solid and the solvent into a vapour.	1. spray dryer 2. freeze dryer 3. drum dryer 4. pulse combustion dryer.
245.	Decomposition of A by first order kinetic shows 50% conversion in 5 min. The value of rate constant is _____min^{-1}	1. -0.667 2. 0.890 3. 0.22 4. 0.1386
246.	Reactions with high activation energy are	1. very temperature sensitive 2. temperature insensitive 3. always irreversible 4. always reversible
247.	Patents and Royalties cost in chemical plant categorized as the …….. while making an estimate of the total product cost for a chemical plant	1. fixed 2. overhead 3. utilities 4. direct production cost
248.	A reactor having a salvage value of Rs 10000 is estimated to have service life of 10 years. The annual interest rate is 10%. The original cost of the reactor was Rs 80000. The book value of the reactor after 5 years using sinking fund depreciation method will be	1. 53196 2. 43196 3. 40096 4. 60196
249.	Equipment installation cost in a chemical process plant ranges from …… percent of the purchased equipment cost.	1. 70 to 80 2. 25 to 55 3. 10 to 20 4. 55 to 65
250.	Expenditure on research and development (R&D) is categorized as the ……., while making an estimate of the total product cost for a chemical plant.	1. direct production cost 2. Overhead cost 3. general expenses 4. fixed expenses
251.	Differential method for analyzing the kinetic data is used	1. for testing complicated mechanism 2. when the data are scattered 3.

		when rate expressions are very simple 4. rate expressions are not available
252.	The “total capital investment” for a chemical process plant comprises of the fixed capital investment and the	1. direct production cost 2. indirect production cost 3. working capital 4. Overhead cost
253.	Check valve is used for ….. flow.	1. very precise control of 2. unidirectional 3. multidirectional 4. inaccurate
254.	For water, when the pressure increases, the viscosity	1. also increases 2. decreases 3. remains constant 4. first decreases, and then increases
255.	A present sum of Rs 100 at the end of one year, with half yearly rate of interest at 10%, will be	1. 101 2. 110 3. 121 4. 112
256.	The unit of mass velocity is	1. kg/m.hr 2. $kg/m^2.hr$ 3. kg/hr 4. kg/m^2
257.	Sterilization by moist heat follows	1. First order reaction 2. Second order reaction 3. Zero order reaction 4. Pseudo first order reaction

258.	Rate of a chemical reaction is independent of the concentration of reactants for --------- reaction	1. zero order 2. first order 3. third order 4. pseudo first order
259.	Milk is dried usually in a	1. freeze dryer 2. spray dryer 3. tray dryer 4. rotary dryer.
260.	Break even point is when the	1. Income meets the Investment 2. Income equals the cost of production 3. Net profit is equal to Initial investment 4. Gross profit is more than the investment
261.	The heat flow through the wall can be increased by putting	1. insulating material 2. extra slab on the surface 3. composite tube on the surface 4. fins on the surface
262.	If ‘n’ is the order of reaction, then unit of rate constant is	1. $1/ ((time)(concentration)^{n-1}$ 2. $(time)^{-1}$ $(concentration)^{n-1}$ 3. $(time)^{n-1}$ (concentration) 4. $(time)^{-1}$
263.	Arhenius equation shows the variation of _____ with temperature	1. rate constant 2.

		reaction rate 3. energy of activation 4. frequency factor
264.	Cost of instrumentation in a modern chemical plant ranges from _____ percent of the total plant cost	1. 5 to 10 2. 20 to 30 3. 40 to 50 4. 60 to 70
265.	The amount of simple interest during 'n' interest period is	1. p.i.n 2. p(1+i.n) 3. p(1+i)n 4. p(1-i.n)
266.	The value of a property decreases _____ with time in straight line method of determining depreciation	1. linearly 2. non-linearly 3. exponentially 4. logarithmically
267.	A machine has an initial value of Rs. 5000, service life of 5 years and final salvage value of Rs. 1000. The annual depreciation cost by straight line method is Rs.	1. 300 2. 600 3. 800 4. 1000
268.	'Six-tenth factor' rule is used for estimating the	1. equipment installation cost 2. equipment cost by scaling 3.

		cost of piping 4. utilities cost
269.	Effluent treatment cost in a chemical plant is categorised as the _____ cost	1. fixed 2. overhead 3. utilities 4. capital
270.	A reactor having a salvage value of Rs. 10000 is estimated to have a service life of 10 years. the annual interest rate is 10%. The original cost of the reactor was Rs. 80,000. the book value of reactor after 5 years using sinking fund depreciation method will be Rs.	1. 40096 2. 43196 3. 53196 4. 60196
271.	Dittus-Boelter equation for determination of heat transfer coefficient is valid	1. for fluids in laminar flow 2. for fluids in Turbulent flow 3. for liquid metals 4. for fluids in transitional flow
272.	'Utilities' in a chemical process plant includes compressed air, steam, water, electrical power, oxygen, acetylene, fuel gases, etc. Utility costs for ordinary chemical process plants ranges roughly from _____ percent of the total product cost.	1. 1 to 5 2. 10 to 20 3. 25 to 35 4. 35 to 45
273.	Prandtl no. is the ratio of	1. momentum diffusivity to mass diffusivity 2. momentum diffusivity to thermal diffusivity 3. thermal diffusivity to mass diffusivity 4.

		thermal diffusivity to momentum diffusivity
274.	purchased cost of equipments for a chemical process plant ranges from _____ percent of the fixed capital investment.	1. 10 to 20 2. 20 to 40 3. 45 to 60 4. 65 to 75
275.	Depreciation is _____ in profit with time.	1. decrease 2. increase 3. no change 4.slight increase or decrease
276.	Baffle spacing	1. is not same as baffle pitch 2. should be less than one fifth the diameter of the shell 3. should be less than the inside diameter of the shell 4. is same as baffle pitch
277.	Which of the following is a component of working capital investment?	1. utilities plants 2. maintenance and repair inventory 3. process equipments 4. depreciation
278.	Heating effectiveness is calculated by	1. (Tha-Thb) / (Tcb-Tca) 2. (Tcb-Tca)/(Tha-Tca) 3. (Tha-Thb) / (Tha-Tca) 4. (Tha-Thb)/(Thb-Tcb)
279.	In financial accounting of a chemical plant, which of the following relationship is invalid?	1. Assets = equities 2.

		Assets = liabilities + net worth 3. total income = costs + profits 4. assets = capital
280.	The _____ of a chemical company can be obtained directly from the balance sheet as the difference between current assets and current liability	1. cash ratio 2. net working capital 3. current ratio 4. liquid assets
281.	Manufacturing cost in a chemical company does not include the	1. fixed charges 2. plant overheads 3. direct products cost 4. administrative expenses
282.	Annual depreciation cost are not constant when, the _____ method of depreciation calculation is used.	1. straight line 2. sinking fund 3. present worth 4. declining balance
283.	Nominal and effective interest rates are equal, when the interest is compounded	1. quarterly 2. semi-annually 3. annually 4. in no case, they are equal
284.	How collision state theory predicts the temperature dependency of reaction rate	1. $k \alpha T e^{-E/RT}$ 2. $k \alpha T^{1/2} e^{-E/RT}$ 3.

		$k \alpha e^{-E/RT}$ 4. $k \alpha T$
285.	Personnel working in the market research group is responsible for the job of	1. equipment selection 2. product evaluation 3. equipment design 4. cost estimation
286.	How transition state theory predicts the temperature dependency of reaction rate	1. $k \alpha T e^{-E/RT}$ 2. $k \alpha T^{1/2} e^{-E/RT}$ 3. $k \alpha e^{-E/RT}$ 4. **$k \alpha T$**
287.	Variable affecting the rate of homogenous reactions are	1. Pressure and temperature only 2. temperature and composition only 3. Pressure and composition only 4. Pressure, temperature and composition
288.	For a zero order reaction, the concentration of product increases with the	1. Increase of reaction time 2. Increase in initial concentration 3. Total Pressure 4. Decrease in total pressure
289.	With the decrease in temperature, the equilibrium conversion of a reversible endothermic reaction	1. Decreases 2. Increases 3. Remains unaffected

		4. Increases linearly with temperature
290.	Conversion increases with increase in temperature in case of an _____ reaction	1. Autocatalytic 2. Irreversible 3. Reversible endothermic 4. Reversible exothermic
291.	A batch reactor is characterised by	1. Constant residence time 2. variation in extent of reaction and properties of the reaction mixture with time 3. Variation in reactor volume 4. very low conversion
292.	Space time equals the mean residence time	1. When the density of reaction mixture is constant 2. For large diameter tubular reactor 3. For narrow diameter tubular reactor 4. For CSTR
293.	Which of the following is the most suitable for very high pressure gas phase reaction?	1. batch reactor 2. tubular flow reactor 3. stirred tank reactor 4. fluidised bed reactor
294.	A plug-flow reactor is characterised by	1. High capacity 2. presence of axial mixing 3. presence of lateral mixing 4. constant composition and temperature of reaction mixture

295.	A back mix reactor	1. is same as plug-flow reactor 2. is same as ideal stirred tank reactor 3. employs mixing in axial direction only 4. is most suitable for gas phase reaction
296.	Oil is hydrogenated using nickel catalyst in a ____ reactor.	1. Batch 2. slurry 3. Fluidised-bed 4. fixed-bed
297.	What is the dimensions of the specific rate constant for the first order reaction?	1. (time) $(Concentration)^{1-n}$ 2. $(time)^{-1}$ $(Concentration)^{n-1}$ 3. $(time)^{-1}$ $(Concentration)^{1-n}$ 4. $(time)^{-1}$
298.	Incorrect statement about pervaporation is	1. independent of vapour/liquid equilibrium 2. low cost 3. require high temperature and high pressure 4. suitable for heat sensible product
299.	Inversion of cane sugar is an example of	1. bimolecular reaction with first order 2. bimolecular reaction with second order 3. unimolecular reaction with second order 4. unimolecular reaction with first order
300.	Which of the following methods is best suited for the separation of a mixture of proteins having large differences in molecular mass?	1. Dialysis 2. Salting out process 3. Density gradient centrifugation 4. Rate zonal centrifugation
301.	The payback method for the measurement of return on investment	1. Cash inflow/investment 2. Investment /Cash outflow

		3. Cash out flow/investment 4. Investment /Cash inflow
302.	In a chemical process plant, the total product cost comprises of manufacturing cost and the	1. general expenses 2. overhead cost 3. R&D cost 4. wages
303.	Gross earning is equal to the total income minus	1. total product cost 2. fixed cost 3. income tax 4. labor wages
304.	Annual depreciation costs are constant, when the ____ method of depreciation calculation is used	1. declining balance 2. straight line 3. sum of the years digit 4. present worth
305.	_____ of depreciation calculation accounts for the interest on investment.	1. Straight line method 2. Declining balance 3. Sum of years digit method 4. Sinking fund method
306.	Ion exchange chromatography is based on the	1. electrostatic attraction 2. electrical mobility of ionic species 3. adsorption chromatography 4.

		partition chromatography
307.	The phenomenon of concentrations of molecules of a gas or liquid at a solid surface is called	1. absorption 2. adsorption 3. catalysis 4. emission
308.	Role of baffles in a fermentor	1. Provide aeration 2. Prevent vortex 3. Ensure proper mixing 4. Controls foam formation
309.	Secondary steps in protein purification includes	1. Homogenization 2. Differential centrifugation 3. Solubilisation 4. Chromatography
310.	In gas chromatography, the concentration of a substance can be determined by ...	1. from the R_t value of the substance. 2. comparison of the area under the peak produced by the substance with the areas under the peaks produced by standard. 3. measurement of the height of the peak produced by the substance. 4. comparison of the R_t of the substance with that of a standard
311.	Which variable affect the rate of heterogeneous chemical reaction?	1. pH transfer 2. Heat and Mass transfer 3. Temperature 4. Heat transfer
312.	The ratio of moles of a reactant converted into the desired product to that converted into unwanted product is called	1. operational yield 2.

		Relative yield 3. Selectivity 4.Conversion
313.	Pressure drop in a fluidised bed reactor is …….. that in a similar packed bed reactor.	1.less than 2.more than 3.same as 4. similar
314.	Which type of liquid liquid extraction if efficient	1. Multistage counter current 2. Multistage cross current 3. Multistage co current 4. Single stage
315.	PSI-BLAST is used for finding	1. Unrelated sequences 2. Distantly related sequences 3. Closely related sequences 4. Proteomic sequence
316.	During evolution, the sequence of protein has change faster than its structure.	1. Partially false 2. Partially true 3. True 4. False
317.	Which is the default scoring matrix used in BLAST?	1. PAM120 2. BLOSUM 60 3. BLOSUM 62 4. PAM240
318.	There are many ways of building phylogenetic trees, one family of methods uses a _____ matrix as a starting point.	1. Distance 2. BLOSUM 3. Edit distance 4. PAM
319.	Expand PAM Matrices used in bioinformatics	1. Probable accepted mutation 2. Point accepted mutation 3. Percent applied mutation 4. Probable applied modification

320.	Phylogenetic tree study based on derived character	1. Phenatics 2. Cladistics 3. Evolutionary systematics 4. Phylogram
321.	Phylogenetic tree building software package except	1. PAUP 2. PHYLIP 3. PILEUP 4. PHYLUM
322.	What sort of characters are useful in constructing phylogenetic trees?	1. orthologous traits 2. analogous traits 3. shared derived traits 4. Paralogous traits
323.	The algorithm for BLAST is based on	1. Neural Network 2. Dynamic Programming 3. Hidden Markov Model 4. k-tuple analysis
324.	Which algorithm is used by local alignment?	1. Needleman-Wunsch 2. BLOSUM 3. Smith-Waterman 4. PAM
325.	The _____ tool compares translated nucleotide query sequence against protein databases.	1. tblastx 2. tblastn 3. blastx 4. blastp
326.	A distance matrix is a table that indicates _____ dissimilarity	1. Pairwise sequence 2. Phylogenetic sequence 3. Multiple sequence 4. DNA sequence
327.	The Needleman and Wunsch Algorithm was published in	1. 1988 2. 1977 3. 1970 4. 1980
328.	Molecular phylogeny can be performed with _____ sequences.	1. only RNA 2. DNA, RNA and protein 3. only protein 4. only DNA
329.	The study of evolutionary relationships is _____.	1. Cladistics 2. Phylogenetics 3. Molecular Evolution 4. Cladogenesis
330.	Which algorithm is used by global alignment?	1. Needleman and Wunsch 2. Smith-Waterman 3. BLAST 4. PAM

331.	The _____ tool compares protein sequence against translated nucleotide databases.	1. tblastn 2. blastp 3. blastn 4. tblastx
332.	The method used for prediction of three dimensional structure of a protein from known structures is,	1. Multiple Sequence alignment 2. Homology Modelling 3. Phylogeny 4. Docking
333.	The method of sequence alignment is/are	1. Dot matrix 2. Dynamic digital 3. KH method 4. KL method
334.	All are sequence alignment tools except?	1. FASTA 2. ClustalW 3. BLAST 4. Rasmol
335.	DNA profiling technique to demonstrate the similarity between animal species with reference to specific protein coding DNA sequences is called:	1. Zoo blot 2. Phylogenetic blot 3. Animal profiling 4. Animal blot
336.	Maximum application of animal cell culture technology today is in the production of:	1.Insulin 2.Interferons 3.Edible proteins 4.Vaccines
337.	Which one is known as animal starch?	1. Chitin 2. Lignin 3. Cellulose 4. Glycogen
338.	In _____ genetics approach, we shall discover the function of a cloned gene whose function is unknown.	1.Forward 2.Reverse 3.Upward 4.Downward
339.	Which of the following is a metabolic database?	1.PIR 2.PDB 3.**KEGG** 4.Uniprot
340.	Cartesian coordinate file can be retrieved from	1.**PDB** 2.PIR 3.MMDB 4.MSD
341.	Repetitive regions between two sequence will be identified by	1.**Dot plot** 2.ClustalW

		3.PAUP 4.Phylip
342.	The alignment procedure that tries to align the entire sequence is	1.Multiple sequence alignment 2.Pairwise alignment 3.**Global alignment** 4.Local alignment
343.	The procedure of aligning many sequences simultaneously i s called	1.**Multiple sequence alignment** 2.Pairwise alignment 3.Global alignment 4.Local alignment
344.	The culturing of cells in liquid agitated medium is called_____	1. liquid culture 2. micropropagation 3. Agar culture 4. suspension culture
345.	In Photosynthesis, during non-cyclic phosphorylation, plants and cyanobacteria produce_____	1. NADPH and ATP 2. NADH and ATP 3. NADPH 4. ATP
346.	Photosystem II obtains electrons by oxidizing water in a process called _____	1. Photolysis 2. Photorespiration 3. electroexitation 4. photochemolysis
347.	The technique of growing plants with their roots immersed in nutrient solution without soil is called _____	1. Aerophonics 2. hydroculture 3.

		Aeroculture 4. hydrophonics
348.	Hairy root cultures for secondary metabolite production are induced by transforming plant cells with_____	1.virus 2.Agrobacterium tumefaciens 3.Bacillus thuringiensis 4. Agrobacterium rhizogenes
349.	_____ provides the inoculum to form cell-suspension cultures in plant tissue culture.	1. Friable callus 2. Compact callus 3. pollen grains 4. ovary
350.	The only known bacteria that is an example for inter-kingdom DNA transfer:	1. A. tumefacians 2. A. rubi 3. A. vitis 4. A. radiobacter
351.	All the statements are true regarding RFLP and RAPD except ___	1. RAPD is a quick method compared to RFLP 2. RFLP is more reliable than RAPD 3. Radioactive probes are not required in RAPD 4. Species specific primers are required for RAPD
352.	The set of DNAs generated by using random primers in a PCR reaction is called _____	1. RAPD 2. RFLP 3. AFLP 4. in situ hybridization
353.	The most widely used chemical for protoplast fusion, as fusogens, is ____	1. Manitol

		2. Sorbitol 3. Mannol 4. Poly ethylene glycol
354.	1. Who is the father of tissue culture?	1.Lalibach and Linus Pauling 2.Haberlandt 3.Harborne 4.Guha and Maheswari
355.	The variation in the restriction DNA fragment lengths between individuals of a species is called _____	1. restriction Fragment Length Polymorphism (RFLP) 2. Random amplified Polymorphic DNA (RAPD) 3. Amplified Fragment Length Polymorphism (AFLP) 4. Simple Sequence repeats (SSR)
356.	The enzyme required to obtained wall free/ nacked protoplasts are	1.cellulase and proteinase 2.cellulase and pectinase 3.amylase and pectinase 4.cellulase and amylase
357.	Application of embryo culture is in _____	1. clonal propagation 2. overcoming hybridization barrier 3. Production of alkaloids 4. Production of soma clonal variation
358.	DNA molecules, identical except for different numbers of super-helical turns are called____	1. Chain isomers 2. Topoisomers 3. Geometrical isomers 4. Helical isomers
359.	Two bacteria most useful in genetic engineering are _____	1. Rhizobium and Azobacter 2. Nitrosomonas and Klebsilla 3. Escherichia and Agrobacterium

		4. Rhizobium and Diplococcus
360.	In FASTA sequence each line should contains ---------- number of amino acids/base pairs.	1. 80 2. 10 3. 40 4. 60
361.	An example of a program for constructing a phylogenetic tree is	1. kylip 2. Prodom 3. Phrap 4. Phylip
362.	In Phylogenetic trees, _____ represent present day species	1. Leaves 2. Root 3. Common ancestors 4. Node
363.	Basic property of a DNA marker ----------	1.Monomorphic 2.Non-Heritable 3. Heritable 4.Unstability
364.	In eukaryotes the ribosomal RNA genes are transcribed by	1.Reverse transcriptase 2. RNA polymerase III 3. RNA dependent RNA polymerase 4. RNA polymerase I
365.	Which type of functional RNA is a primary component of the structures required for protein synthesis?	1. rRNA 2. snRNA 3. mRNA 4.tRNA
366.	Which of the following best describes artificial insemination?	1. Selectively breeding healthy animals 2. Fertilization of an egg in a test tube 3. Transplanting an embryo into the uterus 4. Taking the sperm and placing it directly
367.	Which one of the diuretic increases the blood glucose level?	1. Diamox 2. Chlorothiazide 3. Bumetanide 4.Osmitrol
368.	Which alignment is used to predict whether two sequences are homologous or not?	1.Pair-wise 2.Local 3.Global 4.Multiple
369.	Which homologous genes exist within an organism encoding proteins with related but non-identical functions.	1. Analogs 2.Orthologs 3.Paralogs 4. Histogs
370.	The DNA sequence of a codon in a gene was changed from AATCGTACT to AACGTACT. This type mutation is called	1. Insertion mutation 2. Deletion 3. Transition 4. Inversion
371.	A frameshift mutation could result from	1. A base insertion only 2. A base substitution only 3. A base deletion only 4. Either an insertion or a deletion of a base
372.	A segment of DNA plus a translational start and translational stop codon is called	1.Lagging stand 2. Cistron

		3. Leader strand 4. Codon
373.	Group of genes that are transcriptionally regulated in trans by DNA- binding proteins are called	1.Transcriptor 2.Operon 3.Promoter 4.Repressor
374.	Micelles are characteristic of what kinds of molecules?	1.Nonpolar molecules 2.Charged molecules 3.Amphipathic molecules 4.Polar molecules
375.	The length of the minimum unique stretch of DNA sequence that can be found only once in a 3 billion base pairs long genome is	1. 16 2. 18 3. 15 4. 14
376.	The enzyme responsible for movement of genetic element around the genome is	1. DNA helicase 2. Primase 3. Transposase 4. Reverse transcriptase
377.	Human genome sequencing project involved the construction of genomic library in	1.Bacteriophage 2.Bacterial artificial chromosome 3. pBR322 4. pcDNA3.1
378.	A hetrologous protein for its expression in the milk of transgenic animals should be controlled by which gene promoter	1. Lac Z 2. Preproinsulin 3. Beta-globin 4. Beta-lactoglobulin
379.	Activation tagging can lead to an enhancement expression of adjacent genes in the distance ranging between _____ from the insertion site in plants	1.13.2 kb to 14.6 kb 2.10 kb to 15.6 kb 3. 0.4 kb to 4.6 kb 4.8.0 kb to 12.0 kb
380.	BLAST program used for :	1. end free space alignment 2. local similarity 3. gap penalty 4. global similarity
381.	Retroviruses have advantage for being used as vector for animal cells because	1.Oncogenic 2.Strong promoters 3.Host cover 4.Infection does not lead to cell death.
382.	The modification of exogenous compounds by plant cells are called_____	1. Biotransformation 2. rejuvenation 3. phytocomplementation 4. biophytocontraction
383.	Simple sequence repeats (SSRs) or microsatellites are _____ Markers	1. Dominant 2. Co-dominant 3.

		recessive 4. submissive
384.	Genes or biomarkers that are_____ will be transmitted together from parent to progeny more frequently.	1. Overlapping 2. Linked apart 3. Closely linked 4. Segregated
385.	DNA markers that can discriminate between homozygotes and heterozygotes _____	1. Dominant marker system 2. Codominant marker system 3. Heterogenous marker system 4. Gene marker system
386.	AFLP is a _____	1.Amplicon Length Polymorphism 2.Assisted Fragmented Load Probe 3.Hybridization Probe 4.Amplified Fragment Length Polymorphism
387.	Chromosome doubling in plant tissue culture can be induced by treatment with _____	1. Doxyrubicin 2. Colchicine 3. Quercitin 4. Colchimedine
388.	Trade name of glyphosate is _____	1. Atrazine, 2. paraquat, 3. Basta, 4. Round Up
389.	FlavrSavr tomato has longer shelf life due to _____ technology	1. Gene knockout 2.

		point mutatation 3. Over expression 4. antisense
390.	_____ is the enzyme inhibited to reduce ethylene biosynthesis in tomato.	1. ACC dismutase 2. ACC oxidase 3. Pectin Methyl esterase 4. Polygalactouranase
391.	Deficiency of vitamin A causes _____	1. scurvy 2. cretinism 3. aneamia 4. nyctalopia
392.	What is the concentration of CO2 required for culturing animal cells?	1.30-40% 2. 10-15% 3. 2-5% 4. 15-20%
393.	_____ are the site of heterozygosity for some type of silent DNA variation not associated with any measurable phenotypic variation.	1. SNPs 2. DNA markers 3. molecular scissors 4.silent mutations
394.	Phosphinothricin or BASTA herbicide can be used for GM crops which encodes ____ enzyme.	1. Phosphinothricin acetyl-Transferase 2. Phosphinothricin alkyl-Transferase 3. Phosphinothricin allyl-Transferase 4. Phosphinothricin citryl-Transferase
395.	The genetic variations found in the in vitro cultured plant cells are collectively referred to as _____	1.in vitro variation 2.mutation

		3.somaclonal variation 4.Distortion
396.	The role of TATA box in eukaryotes is	1.Core promoter 2. Operon 3. 5’ cap 4. Inhibitor
397.	_____ is the enzyme inhibited by imidazolinone group of herbicides in plants	1. aceto hydroxy-acid synthase 2. metho hydroxy-acid synthase 3. aceto hydroxy-acid transferase 4. Hydroxy citric acid synthase
398.	MMDB stands for	1.**Molecular Modelling Database** 2.Macromolecular Database 3.Macromolecular Modelling Database 4.Molecular Mechanics Database
399.	The growth medium for mammalian cells contains serum. One of the major functions of serum is to stimulate cell growth and attachment. However, which one of the following must be removed through filter sterilization before it is to be used?	1.Mycoplasma and other microorganisms 2.Foaming agents 3.Large proteins 4.Collagen only
400.	NCBI stands for	1.National centre for Biotechnology Information 2.National centre for Biology Information 3.National centre for Biotechnology Informatics 4.National Centre for Bioinformatics Information
401.	EMBL stands for	1.European Molecular Biology Laboratory 2.European Molecular Biotechnology Laboratory 3.European Molecular Bioinformatics Laboratory 4. European Molecular Biomedical Laboratory
402.	DDBJ stands for	1.DNA Data Bank of Japan 2.DNA Database of Japan 3.DNA Data Biology of Japan

		4. DNA Data Biobase of Japan
403.	PDB stands for	1.**Protein Data Bank** 2.Protein Database 3.Protein Digital Bank 4. Protein Digital Book
404.	Uniprot is a	1.**Protein sequence database** 2.Protein structure database 3.Nucleotide sequence database 4.Gene expression database
405.	Sequin is a	1.Sequence submission tool 2.Structure submission tool 3.Biological data submission tool 4.sequence retrieval tool
406.	In the consensus sequences, substituting of x represents_____ % of identical residues	1. >70 2. <70 3. >60 4. <60
407.	Bankit is a	1.Sequence submission tool 2.Structure submission tool 3.Biological data submission tool 4.Molecular modelling tool
408.	Webin is a	1.Sequence submission tool

		2.Structure submission tool 3.Biological data submission tool 4.Molecular simulation tool
409.	Boolean Operator includes	1.AND-OR-NOT 2.INCASE-AND-OR 3.AND-NOT-IF 4.IF-INCASE-OR
410.	Sakura is a	1.Sequence submission tool 2.Structure submission tool 3.Biological data submission tool 4.Conformational sampling tool
411.	OMIM stands for	1.Online Mendelian Inheritance in Man 2.Online Mendelian inherited Man 3.Online Mendelian Inheritance Map 4.Online Mendelian inheritance Mouse
412.	Literature databases include	1.Pubmed and Medline 2.Medline and PDB 3.Pubmed and PDB 4.OMIM and PIR
413.	Primary nucleotide sequence database includes	1.PAM 2.BLOSSUM 3.DDBJ 4.PSSM
414.	Structure classification database includes	1.SCOP 2.MMDB 3.MSD 4.SSCP
415.	Smith-waterman algorithm is used for	1.Local alignment 2.Global alignment 3.Multiple alignment

		4.Structure prediction
416.	The first three major steps involved in Dynamic programming are	1.Initialization – Matrix filling – Trace backing 2.Initialization – Scoring – Gap penalty 3.Scoring – Gap penalty – Trace backing 4.Matrix filling-Trace backing-Scoring
417.	Linear Gap penalty contain	1. **Gap opening penalty** 2.Gap Extension penalty 3.Positive vale 4.Negative value
418.	Affine Gap penalty contain	1.Both Gap opening penalty and Gap extension penalty 2.Both positive and negative values 3.Arbitrary values 4.0
419.	Edit operator include	1. Insertion 2.Deletion 3.Indel 4. Frameshift
420.	ClustalW is used for	1.Pairwise sequence alignment 2.Multiple sequence alignment 3.Pairwise structure alignment 4.Multiple structure alignment
421.	Sequence alignment helps scientists	1.To trace out evolutionary relationships 2.To predict the replication process 3.To predict transcription process 4. To predict translation process

422.	PSSM stand for	1.Position specific scoring matrix 2.Point specific scoring matrix 3.Putative specific scoring matrix 4.Position secondary structure matrix
423.	BLOSUM stands for	1.Blocks substitution matrix 2.Blocks scoring matrix 3.Blocks secondary matrix 4.Block submission matrix
424.	Transition & Transversion scoring matrix is used for	1.Nucleic acid sequence comparison 2.Protein sequence comparison 3.Protein structure comparison 4.Small molecule comparison
425.	Substitution scoring matrix used for nucleotide sequence alignment is	1.PAM 2.BLOSUM 3.Transition &Transversion 4.Transmutation
426.	Pubmed is a	1.Literature database 2.Sequence database 3.Structure database 4.Chemical database
427.	PMC stands for	1.PubMed Central 2.PubMed Consensus 3.Public Medical Central 4.Public Medicinal Chemistry

428.	Differentiation of shoot in plant tissue culture is controlled by _____	1. high auxin : cytokinin ratio 2. high gibberellin : cytokinin ratio 3. high gibberellin: auxin ratio 4. high cytokinin : auxin ratio
429.	Anti-Histamines inhibits ---------receptor	1.H1 2.H2 3.H2 4.H4
430.	Commercially available animal transgenic is :	1. Pig 2. Cow 3. Sheep 4. Atlantic Salmon
431.	Homologous chromosomes move toward opposite poles of a dividing cell during?	1. Mitosis 2. Meiosis I 3. Meiosis II 4. Fertilization
432.	If recombination frequency between two genes is 50%, it means the genes are	1.Seggregating independently 2.In coupling phase 3.Tightly linked 4.Linked
433.	In BLAST HSPs stands for	1. High-Scoring Segment Pairs 2. High-Segment Search Pairs 3. High Scoring Segment Plot 4. Heat-Scoring Segment Pairs
434.	Conserved regions in multiple sequence alignment will be indicated by	1.Chart 2.Sequence logo 3.Table 4. Graph
435.	Recombinant SV40 viruses introduce the foreign DNA into animal cells	1.With the DNA mediated transfection 2.Without the RNA mediated transfection 3.Without the DNA mediated transfection 4.With the RNA mediated transfection
436.	Dotplot is used to compare	1.Two sequences 2.More than two sequences 3.Two structures 4.More than two structures
437.	Selection of best template from the BLAST based on	1.Max. Percentage of identity and Query coverage 2.The first hit from the BLAST output 3.Max. percentage of identity 4.The last hit from the BLAST output
438.	Edit distance is also called as	1.Levenshtein distance

		2.Hamming distance 3.Gap distance 4.Total scoring
439.	Elicitors are molecules that_____	1.induce cell division 2.stimulate shoot growth 3.stimulate production of secondary metabolites 4.induces root formation
440.	FASTA was published by	1. Altschul et al 2. Sanger 3. Pearson and Lipman 4. Joseph Sambrook
441.	The method of maximum parsimony is also known as	1. Moderate evolution method 2. Zero evolution method 3. Minimum evolution method 4. Maximum evolution method
442.	Hormone pair required for a callus to differentiate into somatic embryos ___	1.auxin and cytokinin 2.auxin and ethylene 3.auxin and gibberlin 4.auxin and ABA
443.	Monomeric units of nucleotide sequence is stored in Biological database as	1.Single letter code 2.Three letter code 3.Numerical code 4.Alphanumeric code
444.	Multiple sequence alignment is used to compare	1.More than two sequences 2.Two sequences 3.Two structures 4.More than two structures
445.	Needleman-Wunsch algorithm is used for	1.Local alignment 2.Global alignment 3.Multiple alignment 4.Function prediction

446.	Quantification of sequence similarity can be computed by	1.Total scoring 2.Regression 3.Correlation 4.T-Test
447.	SCOP stands for	1.Structural Classification of Proteins 2.Structural Cluster of Proteins 3.Structural Collection of Proteins 4.Structural combination of proteins
448.	Substitution scoring matrix include	1.PAM and BLOSUM 2.PAM and GOR 3.BLOSUM and Chou-Fasman 4. GOR and Chou-Fasman
449.	Which one of the following is a protein sequence databases?	1.KEGG and PIR 2.PMC and Uniprot 3.PIR and Uniprot 4.PDB and MMDB
450.	Which of the following is best suited method for production of virus free plants_____	1.Embryo culture 2.Meristem tip culture 3.Ovule culture 4.Anther culture
451.	Substitution scoring matrix used for protein sequence alignment is	1.PAM 2.CN3D 3.MMDB 4. CSD
452.	Which enzyme is responsible for alcoholic fermentation?	1. Ketolase 2. Zymase 3. Oxidase 4. Peroxidase

453.	What is the role of rotameter in a fermentor?	1. measures DO level 2. measures flow rate of air 3. measures rpm 4. prevent vortes
454.	Which is not a submerged culture bioreactor?	1. trickling filters 2. roller bottles 3. rotating drum 4. stirred tank
455.	Which of the below is not a semi-synthetic penicillin?	1. Ampicillin 2. Amoxicillin 3. Penicillin T 4. Penicillin O
456.	The lowest biomass yield in a culture of Escherichia coli will be in	1. an aerated batch reactor containing an initial low concentration of glucose 2. an aerated continuous reactor having a low glucose concentration 3. an aerated batch culture containing a initial high concentration of glucose 4. an aerated fed-batch reactor having a low glucose concentration
457.	When two populations compete for a single growth limiting substrate in a continuous fermenter, which organism would not be washed out?	1. organism at high pH 2. Organism maintaining the highest substrate concentration 3. Organism maintaining the moderate substrate concentration 4. Organism maintaining the lowest substrate concentration
458.	A bacterial strain with a doubling time of 4 hours is mixed with another strain having doubling time 0f 9 hours in equal proportions. The growth is monitored during log phase which lasts for about 3 days. The observed doubling time will:	1. remain constant at about 6.5 hours 2. increase with time 3. decrease with time 4. fluctuate between 4 and 9 hours
459.	Secondary metabolites are produced in which of the following stages?	1. log 2. death 3. Stationary 4. Lag
460.	Which of the following metabolites are implicated in stress tolerance?	1. Citrate 2. phenylalanine 3. tyrosine 4. Proline
461.	_____is an efficient method for producing energy from biomass	1.composting 2.fermentation 3.Recycling 4.Regeneration
462.	Corn starch, cane sugar, and beet sugar all undergo_____ in order to transform into ethanol	1. Mechanical Extraction 2. Fermentation process 3. Mechanical technology 4. Industrial engineering

463.	Which of the following is NOT used to produce ethanol?	1.corn starch 2. oil crops 3. cane sugar 4. Beet sugar
464.	Which of the following was the first amino acid to be produced commercially?	1. L-glutamic acid 2. L-lysine 3.L-Cystine 4. L-methionine
465.	In aerobic yeast fermentation for production of citric acid from alkanes using a fed-batch culture, why alkanes are slowly fed to the yeast?	1. Citric acid is toxic to the cells 2. Alkanes cause foaming 3. Fast addition of alkanes will inhibit the cells and reduce oxygen transfer rates 4.Fast addition of alkanes will cause the cells to grow too quickly
466.	The maximum yield of cell mass per unit mass of the substrate consumed when no maintenance is considered is termed as_____	1. Overall growth yield coefficient 2. ATP coefficient 3. Oxygen coefficient 4. Proton coefficient
467.	The degree of reduction for methane and glucose are	1. 8 and 4 2.2 and 3 3. 4 and 6 4. 5 and 6
468.	The overall del factor (Δ) may be represented as	1.Δoverall = Δheating + Δholding- Δcooling 2. Δoverall = Δheating + Δholding+ Δcooling 3.Δoverall = Δheating - Δholding+ Δcooling 4.Δoverall = Δheating - Δholding- Δcooling

469.	What is OTR and OUR?	1. Oxygen transfer rate and oxygen uptake rate 2. Oxygen utilization rate and oxygen transfer rate 3. Overall transfer rate and overall utilization rate of the reactions 4. over all consuming rate of the oxygen and overall oxygen producing rate of the reactions
470.	Microorganisms using photo energy can be cultivated	1.Photo Bioreactor 2. Membrane bioreactor 3. Sludge process 4. stirred tank bioreactor
471.	_____glycerol is usually used as cyroprotective agent	1. 10% 2. 20% 3. 30% 4. 50%
472.	_____is a small sealed vial which is used to contain and preserve a sample, usually a solid or liquid.	1. Ampoule 2. Cuvette 3. conical flask 4. tank
473.	When nuclei of the cells are fused then they are called as_____.	1. hybrid 2. cybrid 3. protoplast 4. chloroplast
474.	_____ is the situation where the end product of a biochemical pathway inhibits the activity of an enzyme	1. Feedback inhibition 2.

	catalysing one of the reactions (normally the first reaction) of the pathway.	Feedback repression 3. Stimulator 4. Modulator
475.	Which one of the following technique is NOT used to visually identify the mutants?	1. Davis method 2. Replica plating 3. Sandwich technique 4.spreading technique
476.	Freezing of the culture followed by drying under vacuum which results in the sublimation of the cell water is called as _____	1. Lyophillisation 2. Dried cultures 3. liquid nitrogen storage process 4. thawing and evaporation
477.	Ebola is a	1. Virus 2. Bacteria 3. Fungi 4. Algae
478.	MIC IS	1. Modern inhibition chemical 2. Minimum Invasive concentration 3. Minimum Inhibitory concentration 4. Maximum pathogenic inhibition concentration
479.	The media used for cultivation of TB bacilli	1. GH media 2. LJ media 3. LG media 4.

		MEM media
480.	Malachite green is used to stain	1. Capsule 2. Cell wall 3. Flagella 4. Spore
481.	Sterilization of syringes can be done by using	1. Heat 2. Radiation 3. Flaming 4. Incineration
482.	Louis Pasteur discovered vaccine for	1. Measles 2. Polio 3. Rabies 4. Typhoid
483.	The commercial strain used for Penicillin production	1. A567 2. Q176 3. Plak23 4. Gmak 45
484.	Hiss staining is used to stain	1. capsule 2. Mitochondria 3. Spore 4. Flagell
485.	Klebsiella is a	1.

		Phogocytic 2. Immunohypersensitive 3. Compatible 4. Antiphagocytic
486.	Leprosy is also known as	1. TB 2. Hansen disease 3. Infectious 4. Contaminated
487.	Tetrathionate broth is a enrichment media	1. Salmonella 2. Shigella 3. Streptocococcus 4. Bacillus
488.	Penicillin acts on	1. Protein synthesis 2. Cell wall 3. DNA 4. RNA
489.	MPN is used to check the Quality of	1. Pharma products 2. Milk samples 3. Chilli powder 4. Water samples
490.	Bacterial Growth curve is	1. Linear 2.

		Spherical 3. sigmoidal 4. Elliptical
491.	E.coli belongs to	1. Gram positive 2. Enterobacteriaciae 3. Encapsulated group 4. Pathogenic microbe
492.	HIV is a	1. SS RNA virus 2. SS DNA virus 3. DS RNA VIRUS 4. DS DNA VIRUS
493.	SV 40 causes	1. Hepatitis 2. swine flue 3. Sarcoma 4. Ebola
494.	Microbial amylase acts on	1. Pectin 2. Starch 3. Keratin 4. Feather
495.	Aspergillus niger is a	1. Nosocomial 2. viral 3.

		Bacterial 4. oppurtunistic
496.	SS agar is used for	1. Salmonella and streptococcus 2. Salmonella and Shigella 3. Staphylococcus and Streptococcus 4. Streptococcusa and Shigella
497.	Corynebacterium causes	1.Brain fever 2.Hepatitis 3.Diphtheria 4.Influenzae
498.	Paratyphoid is prevalent in the age group	1. Above 25 years 2. Below 20 years 3. Above 60 years 4. Below 40 years
499.	Which of the following is a food infection?	1. Salmonellosis 2. Nosocomial infection 3. Fever 4. Whooping cough
500.	This is a spore forming microbe	1. Bacillus 2. Streptococcus 3. E.Coli 4. Mycoplasma
501.	During malting, barley and other grains are broken down by	1.heating to 95° C 2. lagering 3. yeasts 4.

		Amylases
502.	Leaching process involves	1. Microbe,Metals and minerals 2. Metals ,Microbe and Chemicals 3. Microbe and acids 4. Microbes and animals
503.	Shigella is a	1. Spore forming bacteria 2. Capsule producing bacteria 3. Gram Positive bacteria 4. Gram negative bacteria
504.	Preparation of curd at home is an example of :	1. controlled fermentation 2. back sloping 3. natural fermentation 4. semi-natural fermentation
505.	The apex body for global food trade is:	1. CAC 2. IMF 3. FAO 4. WTO
506.	The premier central Institute involved in development and transfer of technology related to food sector is:	1. NIN 2. ICAR 3. CFTRI 4. Institute of food security
507.	Button mushroom is an example of:	1.

		bacterial SCP 2. fungal SCP 3. yeast SCP 4. algal SCP
508.	Malting process is essential for the commercial production of :	1. beer 2. wine 3. brandy 4. whisky
509.	The best analytical tool for detection of food allergen by the regulatory authorities is :	1. LS-MS 2. qPCR 3. LFA 4. ELISA
510.	To optimize the bioreactor system, which one of the following conditions is least important for anaerobic fermentation?	1. Culture agitation to maintain oxygen supply 2. Restriction of the entry of contaminating organisms 3. Control of parameters like pH and temperature 4. Maintenance of constant culture volume
511.	For scaling up of a bioreactor, the following parameter is assumed to be constant	1. Airflow rate 2. Diameter of the impeller 3. Agitator speed 4. Volumetric mass transfer coefficient
512.	Pickles and sauerkraut share a common inoculum, which is	1. *Lactobacillus plantarum* 2.

		Lactobacillis bulgaricus 3. *Lactobacillis acidophilus* 4. *Saccharomyces cerevisiae*
513.	The AquAdvantage Salmon was produced by	1.sperm mediated gene transfer 2.transfection with retroviral vectors 3.pronuclear DNA microinjection 4.nuclear transfer with modified somatic cells
514.	Quantification of mRNA is possible in:	1. Nested PCR 2. real-time PCR 3. RT- PCR 4. standard PCR
515.	Which of the bacteria can grow in alkaline pH?	1. *Lactobacilli* 2. *Vibrio cholera* 3. *Salmonella* 4. *Staphylococcus*
516.	The percentage fat constituent of double toned milk is	1. 0.5 2. 1.5 3. 3.0 4. 4.5
517.	Which solvent is commonly used to determine fat content	1. Ethyl alcohol

		2. Hexane 3. Acetone 4. Benzene
518.	Which of the following microorganisms is commonly known as ‘Pink Bread Mould‘	1. *Neurospora* 2. *Aspergillus* 3. *Mucor* 4. *Rhizopus*
519.	Vitamin C and vitamin E, BHA and BHT, and sulfites are all	1. Flavour enhancer 2. Antimicrobial agent 3. Incidental food agent 4. Antioxidants
520.	The microbial cause of spoilage of honey	1. *Zygosccharomyces* 2. *Azotobactor* 3. *Fusarium* 4. *Candida*

521.	Cider is the product obtained from	1. Fermentation of plum 2. Fermentation of Peach 3. Fermentation of Apple 4. Distillation of wine
522.	As it comes from a cow, the solids portion of milk contains approximately 3.7 percent fat and percent solids-not-fat.	1. 3% 2. 6% 3. 9% 4. 12%
523.	Which portion of wheat is rich in sugar	1. Endosperm 2. Bran 3. Germ 4. Aleurone layer
524.	Green tea is …	1. Orthodox tea 2.

		Fermented tea 3. Unfermented tea 4. Semi-fermented tea
525.	Out of these quality standards which are mandatory standards	1. Legal Standard 2. Company standards 3. Industry standards 4. Grade standards
526.	Units for radiation energy is	1. Radura 2. Gray (Gy) 3. Percentage 4. MeV
527.	Grapes are rich in	1. Citric acid 2. Ascorbic acid 3.

		Tartaric acid 4. Mallic acid
528.	The most important quality attributes which responsible for colour of the potato chips is	1. Starch 2. Proteins 3. Reducing sugars 4. Vitamin C
529.	Average energy value of carbohydrates in food is	1. 3 kcal/g 2. 4 kcal/g 3. 5 kcal/g 4. 6 kcal/g
530.	Wheat flour with water becomes	1. Elastic and substance is called gluten 2. Weak and substance is called lipid 3. Hard and unable to cook

		4. Wet and difficult to cook
531.	Lipid content in flour results	1. Low flour lipid requires more mixing 2. More flour lipid requires more mixing 3. Low flour lipid requires less mixing 4. Lipid has no effect on dough formation
532.	The word biscuit has been derived from Latin word means "baked twice" is	1. Danis biscuit 2. Danis discoctus 3. Danis biscoctus 4. Danis bisuitoe
533.	Canning of fruits and vegetables is a ……process	1. Cold 2. Heat 3. Irradiation 4. Microwave

534.	Which of these is not a Medium Acid Foods (pH 5.3-4.5)	1. Spinach 2. Asparagus 3. Pumpkin 4. Tomato
535.	Which of these is not an Acid Foods (pH 4.5-3.7)	1. Berries 2. Pear 3. Pineapple 4. Sauce
536.	Fermenters are designed for	1. aerobic process 2. anaerobic process 3. aerobic and anaerobic process 4. antifoaming process
537.	Which of the following is an example for animal media	1. Nutrient agar 2. EMB agar 3. Robertson cooked meat media 4. SS Agar

538.	TMV is a/an	1. Plant pathogen 2. Human pathogen 3. Animal pathogen 4. Nosocomial pathogen
539.	The role of salt in fermented food :	1. enhances the taste 2. increases the shelf life 3. enhances the growth of probiotics 4. it is inert
540.	The following statement is not true for GM based biofortification:	1. Decrease in antimicrobial factors 2. increase in uptake of minerals from soil 3. increase storage of vitamins and minerals in edible part of food crops 4. increase in essential fattyacids and aminoacids
541.	The first commercial successful GM food product in the market is :	1. flavr savr tomato 2. rDNA chymosin 3. rDNA BST 4. golden rice
542.	Mixing in an anearobic sludge blanket reactor is due to	1. Rapid change in water temperatures throughout the reactor 2. release of gases by the microbial populations 3. swimming of microbes 4. BOD
543.	In large scale fermentation, the preferred method of sterilization is	1.Chemicals

		2.Radiation 3.Filtration 4.Thermal
544.	The lowest yield of ATP /is in	1. Fermentation 2. aerobic respiration 3. anaerobic respiration 4. photosynthesis
545.	The highest yield of ATP / is in	1.osmosis process 2.diffusion process 3.transport process 4.aerobic and anaerobic fermentation process
546.	Which of the following is employed for the repeated use of enzymes in bioprocesses?	1. ligation 2. isomerization 3. polymerization 4. immobilization
547.	Which of the following precursor is added in the medium to get penicillin G?	1. Phenyl acetic acid 2. Ammonium sulphate 3. Phenyl carbamic acid 4. Ammonium chloride
548.	For the first time, bacteria were observed by	1. W.H Stanley 2. Louis Pastuer 3. Robert Koch 4. A.V Leeuenhoek
549.	A continuous bioreactor in which only the flow rate is used to make the cell constant is called	1. Turbidostat 2. Chemostat 3. level stat 4. pH

550.	In batch fermentation,	1. substrates are added to the system all at once and runs until product is harvested. 2. nutrients are continuously fed into the reactor and the product is siphoned off during the run. 3. new batches of microorganisms are screened for increased yield. 4. small-scale production is used to synthesize product.
551.	Secondary metabolites	1. are essential to microbe function. 2. are by-products of metabolism that are not important to microbe function. 3. are products that require additional processing before they can be packaged. 4. are harvested during the exponential phase of growth.
552.	_____is a cell that contains genetically different nuclei.	1. Heterokaryons 2. HomoKaryons 3. Protokaryons 4. chlorokaryons
553.	_____is a plant cell that had its cell wall completely or partially removed using either mechanical or enzymatic means.	1. Protoplast 2. Chloroplast 3. fibroplast 4. cyroplast

554.	Lancefield grouping is used to classify	1. Staphylococcus 2. Streptococcus 3. Bacillus 4. Mycobacterium
555.	Trypan blue is used	1. motility 2. viability 3. pathogenicity 4. antigenicity
556.	Fruits used for eradication of 'scurvy' disease is:	1. Guava 2. Aonla 3. Mango 4. Citrus
557.	The major component of bacterial cell wall is a polymer called as	1. Xylan 2. Chitin 3. Cellulose 4. Peptidoglycan
558.	Aeration in a bioreactor is provided by	1. Baffles 2. Impeller

		3. filters 4. Sparger
559.	Lyophilization process involves:	1. Freezing and drying 2. cooling only 3. heating only 4. flaming
560.	If starch containing substrates are used for ethanol production, yeast strain can't be used directly because	1. it is converted to pentose sugar 2. methonol is formed as byproduct 3. there is a increase in biomass 4. it doesn't contain amylases to hydrolyze starch
561.	In a bioreactor baffles are incorporated to	1. Prevent vortex and to improve aeration efficiency 2. Minimize the size of air bubble for greater aeration 3. Maximize the size of air bubble for greater aeration 4.Maintain uniform nutrient medium
562.	Fermentation of grains usually results in production of	1.Carbon dioxide 2.Brine 3.Must 4.Oxygen
563.	If a product is said to be "Sugar Free" it contains how much sugar?	1. More than 20 grams 2. Less than 0.5 grams of sugar per serving 3. Less than 10.0 grams 4. Not more than 40 kcal per serving
564.	Crowded plate method is used for the screening of	1. Antibiotics 2. Enzymes 3. Aminoacids

		4. Aldehydes
565.	The light emitted by luminescent bacteria is mediated by the enzyme	1.Coenzyme Q 2.Luciferase 3.Lactose dehydrogenase 4.Carboxylase reductase
566.	The micro-organisms grow at high salinity are	1.Osmophiles 2.Halophiles 3.Acidophiles 4.Basophiles
567.	The selection of the appropriate purification method in the product recovery after microbial fermentation depends on the	1.Type of the reactor used 2.Availability of Unit operations 3.Degree of purification required 4.Unit process employed
568.	*Saccharomyces cerevisiae* is being grown in a chemostat converts glucose to biomass, ethanol, glycerol and carbon dioxide. At steady state, the concentration of glucose, biomass, ethanol and glycerol will	1. decrease with time 2. increase with time 3. be constant 4. change randomly with time
569.	Purpose of cooling jacket in batch reactor	1. prevent heavy financial losses 2. to maintain and regulate temperature 3. help in easy cleaning of culture medium 4. help in utilizing unproductive time
570.	Which of these is not a Low Acid Foods (pH 5.3 and above)	1. Pea 2. Corn 3. Beet Root 4.

		Lime
571.	Respiratory Quotient is defined as the _____	1. Ratio of the moles of carbon-dioxide produced to the mole of oxygen consumed 2. Ratio of the moles of oxygen produced to the mole of carbon-dioxide consumed 3.Ratio of the molecular mass of oxygen to carbon-dioxide 4. Ratio of the molecular mass of carbon-dioxide to oxygen i
572.	Out of these which is/are irradiated for sterilization purpose:	1. Spices 2. Potatoes 3. Rice 4. Tomatoes
573.	The term cookies derived from	1. Cookie, Latin word 2. Cookie, Dutch word 3. Koekje, Latin word 4. Koekje, Dutch word
574.	ve the differential equation dy – x dx = 0, if the curve passes through (1, 0).	1. $3x^2 + 2y – 3 = 0$ 2. $2y^2 + x^2 – 1 = 0$ 3. $x^2 – 2y – 1 = 0$ 4. $2x^2 + 2y – 2 = 0$

575.	Radium decomposes at a rate proportional to the amount present. If half of the original amount disappears after 1000 years, what is the percentage lost in 100 years?	1. 6.70% 2. 4.50% 3. 5.35% 4. 4.30%
576.	A device that is similar to an RTD but has a negative temperature coefficient:	1. Strain gauge 2. Negative-type RTD 3. Thermistor 4.Thermocouple
577.	digital displays of measurement use the following principle:	1. Bridges 2. Potentiometers 3. Amplifiers 4. Oscillators
578.	Failure of heat sink in an ECG apparatus may lead to _____ noise.	1. EMG artefacts 2. Baseline wander 3. Low frequency 4. High frequency
579.	The auto correlation function of the white noise is:	1. Constant 2. Step function 3. Impulse function 4. Square function
580.	arallel RLC circuit has $\omega_0 = 10^8$ and Q = 40. Given C = 40 pF, the value of R is:	1. 0.5×10^4 2. 10^4

		3. 2×10^4 4. 25
581.	Which of the following is an open loop control system?	1. Field controlled D.C. motor 2. Ward Leonard control 3. Metadyne 4. Stroboscope
582.	Source, drain and gate are terminals of:	1. Diode 2. FET 3. BJT 4. Resistor
583.	ind the differential equation of the family of lines passing through the origin:	1. y dx – x dy = 0 2. x dy – y dx = 0 3. x dx + y dy = 0 4. y dx + x dy = 0
584.	MRI machines are calibrated in _____ units.	1. Hertz 2. Tesla 3. Siemens 4. Ohms
585.	Inspiration : Expiration ratio of a ventilator is usually set at _____ ratio.	1. 1:1 2. 2:1 3. 1:2 4.

		3:1
586.	ss-Seidel iteration method converges only if the Coefficient matrix is:	1. Symmetric 2. Skew-symmetric 3. Diagonally dominant 4. Square matrix
587.	A saw tooth baseline in the ECG indicates:	1. Atrial flutter 2. Ventricular fibrillation 3. Atrial fibrillation 4. Sinoatrial arrest
588.	ers used to reject the 50Hz noise picked up from power lines are called_____.	1. Low pass filters 2. High pass filters 3. Band pass filters 4. Notch Filters
589.	Which of the following is true for a geometric series to be convergent:	1. Common ratio = 1 2. Common ratio < 1 3. Common ratio > 1 4. Common ratio = 0
590.	urier expansion of an even function *f(x)* in (-π, π) has only _____ terms.	1. Sine 2. No terms 3. One term 4. Cosine
591.	Maximum power is transferred when:	1.

		source impedence = load impedence 2. load impedence = 0 3. source impedence < load impedence 4. source impedence > load impedence
592.	Which one of the following is equivalent to AND-OR realization:	1. NAND-NOR realization 2. NOR-NOR realization 3. NOR-NAND realization 4. NAND-NAND realization
593.	What is the major component in a dialysate solution?	1. Chloride 2. Calcium 3. Potassium 4. Sodium
594.	The human speech frequency band has range between:	1. 8000 – 10000 Hz 2. 5000 – 7000 Hz 3. 300 – 3400 Hz 4. 3500 – 4000 Hz
595.	The following filter is used only at higher frequencies:	1. Crystal gate 2. Ladder 3. Full lattice 4. Half lattice
596.	Intel 8080 microprocessor has an instruction set of 91 instructions. The minimum length of the op-code to implement this instruction set is	1. 91 bit 2.

		7 bit 3. 8 bit 4. 5 bit
597.	ve the differential equation: x(y – 1) dx + (x + 1) dy = 0. If y = 2 when x = 1.	1. 1.80 2. 1.48 3. 1.63 4. 1.55
598.	The fetching, decoding and executing of an instruction is broken down into several time intervals. Each of these intervals, involving one or more clock periods, is called a:	1. instruction cycle 2. machine cycle 3. process cycle 4. interval cycle
599.	In an intrinsic Ge the band gap is:	1. 1.6 eV 2. 1.12 eV 3. 0.7 eV 4. 0.6 eV
600.	*log x - log y* is a homogeneous function of degree:	1. No degree 2. 1 3. 0 4. 2
601.	e errors that occur in a measuring instrument that cannot be compensated are:	1. static errors 2. dynamic errors 3.

		random errors 4. measurement errors
602.	Which of the following methods can be used for absolute measurement of resistances?	1. Wheatstone bridge method 2. Ohm's law method 3. Rayleigh method 4. Lorentz method
603.	A square matrix A is a _____ matrix iff $A^T = A^{-1}$:	1. Symmetric 2. Orthogonal 3. Skew symmetric 4. Hermitian
604.	Algebraic sum of currents at a junction is equal to zero is:	1. Ohm’s Law 2. KCL 3. Ampere’s Law 4. KVL
605.	planar graph has 4 nodes and 3 meshes. Then the number of branches it would have is:	1. 3 2. 4 3. 5 4. 6
606.	The heat sink disposes off heat mainly by:	1. Radiation 2. Natural convection 3. Forced convection 4.

		Conduction
607.	he maximum power delivered by a short wave diathermy machine is _____.	1. 250W 2. 750W 3. 500W 4. 125W
608.	egulation of voltage by Zener diode is accomplished by:	1. Forward bias 2. Reverse bias 3. Gate voltage 4. Thermal effect
609.	The most common operational amplifier used is:	1. 8056 2. 8088 3. 741 4. 8051
610.	Which of the following terms indicates the physiological process of changing from the resting potential state to action potential state:	1. Polarization 2. Propagation rate 3. Depolarization 4. Transmission
611.	For a periodic function, the spectral density and the auto correlation function are:	1. Fourier transform pair 2. Laplace transform pair 3. Equal 4. Symmetric
612.	The discrete time system described by $y(n)=x(n^2)$ is:	1.

		Causal, linear and time variant 2. Causal, nonlinear and time variant 3. Non-causal, linear and time invariant 4. Non-causal, nonlinear and time variant
613.	face ECG recording is usually recorded as a voltage versus time using a calibration of _____mm per mV and a paper speed of _____mm per second.	1. 25 &10 2. 10 & 25 3. 15 & 10 4. 10 & 15
614.	e average power of the signal satisfies the condition $0 < P < \infty$, then the signal is called:	1. Energy signal 2. Power signal 3. Primary signal 4. Random signal
615.	Probability density function of thermal noise is:	1. Gaussian 2. Binomial 3. Poisson 4. Impulse
616.	For the curve $y = xe^x$, the point:	1. x = -1 is a maximum 2. x = 0 is a minimum 3. x = -1 is a minimum 4. x = 0 is a maximum
617.	he population of a country doubles in 50 years. How many years will it be five times as much? Assume that the rate of increase is proportional to the number inhabitants.	1. 100 years 2.

		116 years 3. 120 years 4. 98 years
618.	ich of the following is a partial differential equation of first order and first degree:	1. $x^2p^2 = yq^2$ 2. pq = xy 3. $p^2 = q$ 4. zp + yq = x
619.	' is the real power, Q is the reactive power and Cos Φ is the power factor, then:	1. P=Q Tan Φ 2. Q=P Tan Φ 3. P = Q 4. Q=P Sin Φ
620.	The maximum value of xy subject to x+y = 8 is:	1. 24 2. 20 3. 16 4. 8
621.	problem is given to three students A,B,C whose chances of solving it are 1/2,1/3 and 1/4 respectively. The probability that the problem will be solved is:	1. 3/4 2. 1/2 3. 1/4 4. 0
622.	On the Argand diagram, the cube roots of unity lie on:	1. Equilateral triangle 2. Right angled triangle 3.

		Straight line 4. Isosceles triangle
623.	An inductance with Q factor below 10 is measured with:	1. Maxwell's Bridge 2. Anderson Bridge 3. Schering Bridge 4. Kelvin's Bridge
624.	e number of spectral components when two sine waves are multiplied are:	1. 2 2. 4 3. 6 4. 8
625.	Frequency range of Gamma waves in EEG in Hz is:	1. 4 – 7 2. 7 – 14 3. 15 – 30 4. 30 – 100
626.	An oscillator works on the following feedback:	1. positive 2. negative 3. positive or negative 4. positive and negative
627.	The phenomena where the inductive reactance is equal to capacitive reactance in an A.C. circuit is called:	1. Resonance 2. Faraday effect 3. Thomson effect 4.

		Photoelectric effect
628.	Amplitude range of normal ECG signals in mV:	1. 0.001 – 100 2. 0.001 – 0.3 3. 0.001 – 1 4. 0.05 – 3
629.	A non-linear network does not satisfy:	1. homogeneity condition 2. super position condition 3. both homogeneity as well as super position condition 4. homogeneity, super position and associative condition
630.	Which of the following is a nonlinear circuit parameter:	1. Inductance 2. Condenser 3. Wire wound resistor 4. Transistor
631.	a d.c. circuit the voltage is 10 V and the load resistance is 2 Ω. The power drawn is:	1. 50 2. 100 3. 25 4. 5
632.	Conventional biasing of a bipolar transistor has:	1. EB forward biased and CB forward biased 2. EB reversed biased and CB forward biased 3. EB forward biased and CB reverse biased 4. EB reversed biased and CB reverse biased

633.	The first instrument to be inserted during a laparoscopy procedure is _____.	1. Trocar 2. Insufflator 3. Veress needle 4. Cannula
634.	closed loop control system, with positive value of feedback gain, the overall gain of the system:	1. decreases 2. increases 3. is unaffected 4. is maximum
635.	PET in radiology stands for:	1. Positive Electron Technology 2. Positron Electron Technology 3. Positron Electron Tomography 4. Positron Emission Tomography
636.	Which of the following is the fastest memory cell:	1. Core memory 2. Semiconductor memory 3. Double memory 4. Super conductor memory
637.	Varistors are:	1. Carbon resistors 2. Insulators 3. Nonlinear resistors 4. Resistors with zero temperature coefficient
638.	Which of these has the least permeability through flat membrane of hemodialysis?	1. Creatinine 2.

		Raffinose 3. Vitamin B12 4. Urea
639.	Sampling theorem finds application in:	1. Amplitude modulation 2. Time modulation 3. PCM 4. Frequency modulation
640.	number of bits required to represent number 33 in binary is:	1. 4 2. 5 3. 6 4. 7
641.	A consistent deviation in a measuring instrument is:	1. time variant 2. precision 3. accuracy 4. correctness
642.	e length of instruction register of a 8085 microprocessor is:	1. 6 bits 2. 8 bits 3. 12 bits 4. 16 bits
643.	nciple of charging and discharging of capacitors is used in:	1. Q-meter 2. Potentiometer 3.

		Strain gauge 4. LVDT
644.	Displacement can be measured using:	1. LVDT 2. Thermo couple 3. RTD 4. Thermistor
645.	Which of the following is not a bio electrical potential:	1. MEG 2. Body temperature 3. EMG 4. ECG
646.	Which of the following circuit exhibits memory:	1. Astable multivibrator 2. Bistable multivibrators 3. NAND gate 4. XOR gate
647.	A Schering's bridge is used to measure:	1. resistance 2. capacitance 3. inductance 4. conductance
648.	_____ is an electrical pulse generator that starts or maintains the normal heart rhythm.	1. Pacemaker 2. Defibrillator 3. Hemodialyser 4.

		Oscillator
649.	pedence matching of circuits use following configuration:	1. common emitter 2. common base 3. common collector 4. push – pull configuration
650.	A n-channel FET has a _____ gate:	1. n-type 2. p-type 3. p-n type 4. n-p type
651.	w many electrodes are present in 10/20 electrode placement system of EEG machine?	1. 10 2. 11 3. 20 4. 21
652.	A Schmitt trigger is a digital circuit that produces a _____ output regardless of the input waveform:	1. Sinusoidal 2. Trapezoidal 3. Rectangular 4. Triangular
653.	Correlogram is a graph of _____.	1. Amplitude of one signal plotted against the amplitude of another signal 2. Frequency of one signal plotted against the frequency of another signal 3. Amplitude of one signal plotted against the frequency of another signal 4.

		Frequency of one signal plotted against the time period of another signal