FINAL ANSWER KEY

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Question1:-Which of the following pair is correct about solubilizers and the bond they disrupt?

A:-Urea - hydophobic interaction, SDS - hydrogen bond, β - mercaptoethanol - disulpide bridges

B:-Urea - hydrogen bond, SDS - hydrophobic interaction, β - mercaptoethanol - disulpide bridges

C:-Urea - hydrogen bond, SDS - disulpide bridges, β - mercaptoethanol - hydrophobic interaction

D:-Urea - hydrophobic interaction, SDS - disulphide bridges, β - mercaptoethanol - hydrogen bond

Correct Answer:- Option-B

Question2:-Which among the following substituents enhance fluorescence of a compound?

(i) -OH

(ii) $-NO_2$

(iii) $-NHCH_3$

(iv) -COOH

A:-(i) and (iii)

B:-(i) and (iv)

C:-(ii) and (iv)

D:-(ii) and (iii)

Correct Answer:- Option-A

Question3:-Nuclei that do not have possess spin property includes

(i) $^{12}C_6$

(ii) $^{13}C_6$

(iii) $^{17}O_8$

(iv) $^{16}O_8$

A:-(i) and (iii)

B:-(ii) and (iii)

C:-(i) and (iv)

D:-(ii) and (iv)

Correct Answer:- Option-C

Question4:-Give the right sequence of RT-PCR
(i) Taq polymerase extends target sequences
(ii) Extract poly(A)+RNA
(iii) Oligo primers bind to target sequences
(iv) Extend with reverse transcriptase to form cDNA
(v) ds cDNA denaturated by heating to >94°C
(vi) Anneal Poly(dT) primer

A:-(ii), (vi), (iv), (v), (iii), (i)

B:-(v), (iii), (i), (ii), (vi), (iv)

C:-(ii), (vi), (v), (iii), (i), (iv)

D:-(i), (iii), (v), (ii), (iv), (vi)

Correct Answer:- Option-A

Question5:-Which of the following is true for achromat objective lenses in a microscope?
(i) They are cheapest objective lens
(ii) They are corrected for spherical aberrations with green light
(iii) They are best used when the light source utilizes a green filter and images are collected in grayscale
(iv) They are spherically corrected for three wavelengths

A:-(i), (ii), (iv)

B:-(i), (iii), (iv)

C:-(ii), (iii), (iv)

D:-(i), (ii), (iii)

Correct Answer:- Option-D

Question6:-Select the correct pair of luminescence system and measured moiety.

A:-Firefly luminescence-ATP, bacterial luminescence -H_2O_2, Chemiluminescence-NADH

B:-Firefly luminescence- H_2O_2,bacterial luminescence-NADH, Chemiluminescence-ATP

C:-Firefly luminescence-ATP, bacterial luminescence-NADH, Chemiluminescence-H_2O_2

D:-Firefly luminescence-NADPH, bacterial luminescence-ATP, Chemiluminescence-H_2O_2

Correct Answer:- Option-C

Question7:-Choose the right facts in Connection to PAGE

A:-Stacking gel has 5-10% acylamide and pH 8.3, Running gel has 2-3% acrylamide and pH 6.7

B:-Stacking gel has 2-3% acylamide and pH 6.7, Running gel has 5-10% acrylamide and pH 8.3

C:-Stacking gel has 5-10% acylamide and pH 6.7, Running gel has 2-3% acrylamide and pH 8.3

D:-Stacking gel has 2-3% acylamide and pH 8.3, Running gel has 5-10%

acrylamide and pH 6.7

Correct Answer:- Option-B

Question8:-Match the following:

	Column I		Column II
i	Alkaloids	1	C6-C3-C6
ii	Tannins	2	
iii	Phenolic compounds	3	$(C6\text{-}C3\text{-}c6)_n$
iv	Flavonoids	4	

A:-i-4, ii-3, iii-2, iv-1

B:-i-3, ii-4, iii-2, iv-1

C:-i-1, ii-3, iii-4, iv-2

D:-i-2, ii-4, iii-1, iv-3

Correct Answer:- Option-A

Question9:-Select the group consisting of compounds belonging to alkaloid class

A:-Quinine, papaverine, nicotine, cocaine

B:-Quercetin, papaverine, nicotine, cocaine

C:-Quinine, chrysin, papaverine, quercetin

D:-Quercetin, chrysin, nicotine, cocaine

Correct Answer:- Option-A

Question10:-Which of the following is true about function of alkaloids?

i. Reserpine which lowers blood pressure
ii. Cocaine is an anaesthetic
iii. Vincristine is cytotoxic agents
iv. Anthocyanins play an important role in insect mimicry

A:-i, iii, iv

B:-ii, iii, iv

C:-i, ii, iii

D:-i, ii, iv

Correct Answer:- Option-C

Question11:-Which of the following does not belong to the class of phenolic compound?

A:-Caffeic acid

B:-Vanillic acid

C:-Coumaric acid

D:-Caffein

Correct Answer:- Option-D

Question12:-From which among the following is etoposide derived from?

A:-Coumarin

B:-Podophyllotoxin

C:-Pinobanksin

D:-Genistein

Correct Answer:- Option-B

Question13:-Choose the set of secondary metabolites.

A:-Glucose, Resveratrol, Lignans

B:-Camptothecin, Codeine, Valine

C:-Malaxin, quercetin, Napthoquinones

D:-Malaxin, Codeine, Chlorophyll

Correct Answer:- Option-C

Question14:-_____ is the secondary metabolite obtained from 'tree of joy'.

A:-Malaxin

B:-Camptothecin

C:-Denbinobin

D:-Codeine

Correct Answer:- Option-B

Question15:-The techniques that help to determine functional group present in isolated secondary metabolite of a plant is

A:-IR Spectroscopy

B:-Mass Spectroscopy

C:-UV-Visible Spectroscopy

D:-None of the above

Correct Answer:- Option-A

Question16:-Choose the correct test to detect the presence of glycosides in plant extract.

A:-Keller Killiani test

B:-Mayers test

C:-Wagners test

D:-Salkowski's test

Correct Answer:- Option-A

Question17:-On shaking plant extract with acidified chloroform and allowing to stand, yellow colour appears in lower layer. Presence of which phytochemical is indicated by this test?

A:-Flavonoids

B:-Tannins

C:-Triterpenoids

D:-Steroids

Correct Answer:- Option-C

Question18:-An enzyme with nomenclature EC 2.7.3.2 belongs to _____ class.

A:-Transferase

B:-Ligase

C:-Isomerase

D:-Lyase

Correct Answer:- Option-A

Question19:-The sets of enzymes that are markers of myocardial infarction

A:-GOT, GPT, CK

B:-GOT, LDH, GPT

C:-GPT, LDH, CK

D:-GOT, CK, LDH

Correct Answer:- Option-D

Question20:-Which of the following statement is correct?

A:-In Competitive inhibition Vmax is unchanged, Km decreases

B:-In Competitive inhibition Vmax is unchanged, Km increases

C:-In non-competitive inhibition Vmax is unchanged, Km decreases

D:-In non-competitive inhibition Vmax is unchanged, Km increases

Correct Answer:- Option-B

Question21:-Bell shaped curve is obtained for enzyme velocity with

A:-Increasing temperature and increasing enzyme concentration

B:-Increasing temperature and increasing pH

C:-Increasing substrate concentrate and enzyme concentration

D:-Increasing pH and increasing enzyme concentration

Correct Answer:- Option-B

Question22:-Select the false statement regarding active site of enzyme.

A:-Active site possesses a substrate binding site and a catalytic site

B:-Active sites are regarded as clefts or crevices

C:-Active site is rigid in structure and shape

D:-Active sites frequency has the amino acid serine

Correct Answer:- Option-C

Question23:-Km value is unchanged while Vmax is lowered in

A:-Competitive inhibition

B:-Non-competitive inhibition

C:-Uncompetitive inhibition

D:-Irreversible inhibition

Correct Answer:- Option-B

Question24:-Which of the following is different from rest of the inhibitors?

A:-Disulfiram

B:-Cyanide

C:-Fluoride

D:-Allopurinol

Correct Answer:-Question Cancelled

Question25:-Choose the correct pair of coenzyme and corresponding vitamin.

A:-Vit B1-TPP, Vit B2-FMN, Vit B6-PLP

B:-Vit B1-FMN, Vit B2-TPP, Vit B6-PLP

C:-Vit B1-PLP, Vit B2-TPP, Vit B6-TPP

D:-Vit B1-TPP, Vit B2-PLP, Vit B6-FMN

Correct Answer:- Option-A

Question26:-For plot of V against [S], allosteric enzyme exhibits

A:-Hyberbolic curve

B:-Sigmoidal curve

C:-Bell shaped curve

D:-None of the above

Correct Answer:- Option-B

Question27:-Acute pancreatitis is characterised by

A:-↑ Acid phosphatase

B:-↑ Serum amylase

C:-↑ Acid phosphatase and ↑ serum amylase

D:-↓ Acid phosphatase and ↓ serum amylase

Correct Answer:- Option-B

Question28:-Choose the incorrect statement.

A:-SEM provides 3D image, TEM provides 2D image

B:-Magnification caused by TEM is higher than that of SEM

C:-In SEM, sections of sample is coated with a thin layer of a heavy metal such as gold

D:-SEM has higher resolution than TEM

Correct Answer:- Option-D

Question29:-Bragg equation states that

A:-$n\lambda = 2dSin(1/\theta)$

B:-$n/\lambda = 2dSin\theta$

C:-$n\lambda = 2dSin\theta$

D:-$n/\lambda = 2dSin(1/\theta)$

Correct Answer:- Option-C

Question30:-Pick out the right statement regarding MALDI-TOF MS.

A:-MALDI produces abundant amounts of fragmentation

B:-TOF is used to ionize the sample

C:-UV-light absorbing matix is used

D:-MALDI is the mass analyser

Correct Answer:-Question Cancelled

Question31:-Mammalian cells use several cdks and cyclins to regulate passage through the cell cycle. Match the correct combinations which regulate the different phases of the cell cycle.

Cdks	Cyclins	Cell cycle phases
1. Cdk1	a. Cycline A	i. G1 phase
2. Cdk2	b. Cycline B	ii. S phase
3. Cdk4	c. Cycline D	iii. G2 phase
		iv. Mphase

A:-3. Cdk4 c. Cycline D i. G1 phase
2. Cdk2 a. Cycline A ii. S phase
1. Cdk1 b. Cycline A iii. G2 phase
1. Cdk1 a. Cycline B iv. M phase

B:-1. Cdk1 a. Cycline A i. G1 phase
2. Cdk2 b. Cycline B ii. S phase
3. Cdk4 c. Cycline D iii. G2 phase
1. Cdk1 b. Cycline B iv. M phase

C:-2. Cdk2 b. Cycline B i. G1 phase
1. Cdk1 c. Cycline D ii. S phase
3. Cdk4 a. Cycline A iii. G2 phase
2. Cdk2 c. Cycline D iv. M phase

D:-3. Cdk2 c. Cycline B i. G1 phase
1. Cdk1 b. Cycline D ii. S phase
2. Cdk4 a. Cycline A iii. G2 phase
3. Cdk2 a. Cycline D iv. M phase

Correct Answer:- Option-A

Question32:-The following are the molecular cancer biomarkers used to diagnose cancer in the human body. Find the correct combination of markers used to identify the different types of cancer

A.	AFP	i.	Brest cancer
B.	HER-2	ii.	Colorectal cancer
C.	CA -125	iii.	Liver cancer
D.	CEA	iv.	Ovarian cancer

A:-A-iv, B-ii, C-i, D-iii

B:-A-ii, B-iii, C-iv, D-i

C:-A-iii, B-i, C-iv, D-ii

D:-A-i, B-iv, C-iii, D-iv

Correct Answer:- Option-C

Question33:-Movement of Na^+ through open voltage-gated Na^+ channels is driven by

A:-The Na^+ concentration gradient across the membrane

B:-The membrane potential at rest

C:-The Na^+ concentration gradient across the membrane and membrane potential at rest

D:-The Na^+ concentration gradient across the membrane and membrane potential at the peak of the action potential

Correct Answer:- Option-D

Question34:-Select the incorrect statements concerning membrane proteins
A. The plasma membrane of the cell contains 50% of the proteins by mass
B. The transmembrane proteins are amphipathic and can function on both sides of the bilayer or transport molecules across it
C. Mutation (V509A) in integral membrane protein thyrotropin receptor leads to congential hypothyrodism
D. Peripheral membrane proteins are permanently attached to one face of a membrane by noncovalent interactions with other membrane proteins and involve in cell signalling

A:-A, B and C

B:-A and C

C:-Only D

D:-C and D

Correct Answer:- Option-D

Question35:-The statements below address receptor-mediated endocytosis. Which of the following statements about receptor-mediated endocytosis is true?
A. In receptor-mediated endocytosis, the extracellular materials bind to complementary receptors on the cell surface and enter the cell
B. GGA adaptor molecule associated with clathrin-mediated endocytosis
C. Receptor-mediated endocytoasis (RME) leads to the formation of mannose-coated pits
D. Dynamin is a large GTP-binding accessory protein that aids in the release of the clathrin-coated vesicle from the membrane

A:-All the statements are true

B:-A and D are true

C:-B and C are true

D:-C and D are true

Correct Answer:- Option-B

Question36:-Which of the following describes the effective dose of the drug?

A:-The dose required to kill 50% of the tested animals

B:-The dose at which all the tested animals exhibit a biological response

C:-The dose at which 50% of the tested animals exhibit a biological response

D:-The dose at which some animals exhibit a biological response

Correct Answer:- Option-C

Question37:-Match the following drugs with their General targets

Drugs	General Targets
A. Rifampicin	i. Act on 30S subunit of ribosome and block the protein synthesis
B. Tetracycline	ii. Binds to RNA polymerase and interferes transcription process
C. Cephalosporins	iii. Act on 50S subunit of ribosome and block the protein synthesis
D. Erythromycin	iv. Inhibit the cell wall synthesis

A:-A-iv, B-ii, C-i, D-iii

B:-A-ii, B-i, C-iv, D-iii

C:-A-ii, B-iii, C-iv, D-i

D:-A-iii, B-iv, C-i, D-ii

Correct Answer:- Option-B

Question38:-Which of the following statement about Cytochrome P450 is false?

A:-Cytochrome P450 (CYP) is a hemeprotein that plays an important role in drug and xenobiotic metabolism

B:-A fat-free diet increases the Cytochrome P450 level

C:-Phase I reactions of drug metabolism are mainly catalyzed by the Cytochrome P450

D:-Cytochrome P450 belongs to the class of enzymes called monooxygenase

Correct Answer:- Option-B

Question39:-Which of the following reaction doesn't involve phase II of drug metabolism

A:-Glucuronidation

B:-Sulfaction

C:-Methylation

D:-Hydroxylation

Correct Answer:- Option-D

Question40:-Match the bacterial toxins with their mode of action

Toxins	Mode of action
A. Pertussis toxin	i. Inhibit neurotransmitter release in a neuron
B. Diphtheria toxin	ii. Selective blockers of acetylcholine release from nerve endings
C. Botulinum toxin	iii. Inactivates elongation factor (EF-2) and inhibits

			protein synthesis
D.	Tetanus Toxin	iv.	Inactivities G proteins and blocks the signal transduction

A:-A-iv, B-iii, C-ii, D-i

B:-A-ii, B-iv, C-i, D-iii

C:-A-iii, B-ii, C-i, D-iv

D:-A-i, B-ii, C-iii, D-iv

Correct Answer:- Option-A

Question41:-Hypersensitivity reactions can be classified into four types. Which of the following types has correctly matched concerning its immune responses?

A. Type I - IgE mediated immediate reaction
B. Type II - Immune complex-mediated reaction
C. Type III - Antibody-mediated cytotoxic reaction (IgG or IgM antibodies)
D. Type IV - Cell-mediated, delayed hypersensitivity reaction

A:-All the types are correctly matched

B:-B and C only

C:-A and D only

D:-A and C only

Correct Answer:- Option-C

Question42:-Which of the following statement is false with respect to type III Hypersensitivity reaction

A:-Antigen-antibody forms a large complex and is deposited in the nearby tissue

B:-Penicillin can induce Type III hypersensitivity reaction alone

C:-Systematic Lupus Erythematosus is an example of type III hypersensitivity reaction

D:-In type III hypersensitivity reaction Immune complex activate the complement system and anaphylatoxins

Correct Answer:- Option-B

Question43:-Which of the following statements are not true about drug addiction?

A. Drugs of abuse cause the brain's limbic system to release dopamine, the neurotransmitter that produces feelings of pleasure
B. Drug tolerance makes people need more and more of the same drug because, over time, drugs will cause the brain to produce less dopamine
C. Marijuana and heroin can activate neurons because their chemical structure mimics that of a natural neurotransmitter in the body
D. Cocaine and amphetamines directly increase extracellular dopamine by blocking the presynaptic dopamine transporter (DAT)

A:-B alone

B:-A alone

C:-B and C

D:-None of the above

Correct Answer:- Option-D

Question44:-Classify the drug based on its source

A.	Digoxin	i.	Microbial
B.	Thyroxin	ii.	Synthetic
C.	Dextran	iii.	Plant
D.	Aspirin	iv.	Animal

A:-A-i, B-ii, C-iii, D-iv

B:-A-iii, B-iv, C-i, D-ii

C:-A-ii, B-iii, C-iv, D-i

D:-A-iv, B-i, C-ii, D-iii

Correct Answer:- Option-B

Question45:-Drug distribution will be influenced by

A. Tissue/organ blood flow
B. Physicochemical properties of the drug
C. Influx and efflux transporters
D. Plasma protein and tissue binding

A:-A, B and C only

B:-A, C and D only

C:-All of the above

D:-A, B and D only

Correct Answer:- Option-C

Question46:-The complement system is a potent mediator of inflammation and destruction and could cause extensive damage to host cells if uncontrolled. The complement system is tightly regulated by inhibitory/regulatory proteins. The following is the list of the key regulatory proteins that regulate the complement system. Match the regulatory proteins of the complement system with the stated functions.

A.	CI Inhibitor	i.	Enzymatically inactivities C4b and C3b
B.	DAF	ii.	Promotes C3b and C4b inactivation
C.	MCP	iii.	Binds to C1r and Cls prevents further activation of C4 and C2
D.	Factor I	iv.	Inactivates C3b and C4b

A:-A-ii, B-i, C-iv, D-iii

B:-A-iii, B-iv, C-ii, D-i

C:-A-i, B-ii, C-iii, D-iv

D:-A-iv, B-iii, C-i, D-ii

Correct Answer:- Option-B

Question47:-Which of the following statements regarding the live attenuated vaccine is incorrect?

A:-This vaccine is prepared using the whole weakened form of the pathogen that causes a disease

B:-It can develop a long-lasting immune response with the administration of 1 and 2 doses

C:-Live attenuated vaccines are used to protect Rotavirus, Yellow fever and MMR

D:-Live attenuated vaccine is stable at normal room temperature

Correct Answer:- Option-D

Question48:-Which of the following method is currently used to deduce the evolutionary relationship between bacteria?

A:-GC content analysis

B:-DNA-DNA hybridization and analysis

C:-16S rRNA analysis

D:-DNA melting temperature analysis

Correct Answer:- Option-C

Question49:-Multidrug resistance in bacteria may be generated by
A. Horizontal gene transfer
B. Mutations in the DNA
C. Enzymatic Inactivation of the Drug
D. Increased expression of genes that code for multidrug efflux pumps

A:-A only

B:-A and D only

C:-B and C only

D:-All of the above

Correct Answer:- Option-D

Question50:-The databases for the model organisms are given below. Match it to appropriate model organisms

A.	MAtDB	i.	Mouse
B.	FlyBase	ii.	C.elegans
C.	WormBase	iii.	Arabidopsis
D.	MGI	iv.	Drosophilia

A:-A-iii, B-iv, C-ii, D-i

B:-A-iv, B-iii, C-i, D-ii

C:-A-ii, B-i, C-iv, D-iii

D:-A-iii, B-ii, C-iv, D-i

Correct Answer:- Option-A

Question51:-If the centre of gravity of a molecule changes during motion, then the molecule have,

A:-Rotational Energy

B:-Translational Energy

C:-Vibrational Energy

D:-All the above

Correct Answer:- Option-B

Question52:-Identify the correct statement from the following
A. Spectroscopy is the study of the interaction between matter and radiated energy
B. Spectrometry is a practical measurement in the atomic and molecular balances of matter
C. Spectroscopy is a theoretical method of science that does not produce any results
D. Spectrometry the study of matter's absorption properties or absorption behaviour when exposed to electromagnetic radiation.

A:-A, B and C are correct

B:-A, B and D are correct

C:-A, C and D are correct

D:-All statements are correct

Correct Answer:- Option-D

Question53:-When we consider Raman scattering spectrum, and if we designate the intensities of the most intense lines of the stoke lines, Anti stokes lines and Raleigh scattering are I_a,I_b and I_c respectively, the the inceasing order will be

A:-$I_a>I_b>I_c$

B:-$I_a<I_b<I_c$

C:-$I_a>I_c>I_b$

D:-$I_c>I_a>I_b$

Correct Answer:- Option-D

Question54:-Carbonyl group show λ_{max} somewhere in ultraviolet region, but their 2,4 dinitrophenylhydrazone derivatives show λ_{max} in the visible region. This is due to

A:-Hypsochromic shift

B:-Bathochromic shift

C:-Hyperchromic shift

D:-Hypochromic shift

Correct Answer:- Option-B

Question55:-Select the false statement(s) from the following
A. As bond order decreases, bond energy as well as force constant increase
B. As bond energy increases, bond length decreases and force constant increases
C. As bond length increases bond energy decreases and force constant also decreases
D. As force constant decreases, bond length decreases and bond energy increases

A:-A and C are false

B:-A and D are false

C:-A and B are false

D:-All statements are false

Correct Answer:- Option-B

Question56:-The expected number of ESR signals for methyl free radical and benzen anion are respectively

A:-7 and 10

B:-4 and 7

C:-4 and 10

D:-7 and 25

Correct Answer:- Option-B

Question57:-Which one of the following is false for Doppler broadening of spectral lines

A:-Doppler broadening of peak is Gaussian in character

B:-Doppler broadening depends on the molar mass of gas molecule

C:-Doppler broadening is proportional to temperature

D:-Doppler broadening is proportional to pressure of the gas

Correct Answer:- Option-D

Question58:-Identify the statement regarding the reference molecule used in NMR spectrsocopy

A. TMS will give weak NMR absorption even in dilute solutions
B. The Shielding of protons in TMS is greater than in most organic molecules
C. The methyl group of DSS resonate at a different position of the methyl group of TMS
D. DSS or its sodium salt is more often used as calibration standard of NMR for protein experiments in water

A:-A and B are correct

B:-B and C are correct

C:-C and D are correct

D:-D and B are correct

Correct Answer:- Option-D

Question59:-The transitions of the electron between the molecular orbitals for the absorption in the region 200 to 800 nm is not possible for

A:-σ to σ*

B:-∏ to ∏*

C:-n to σ*

D:-n to ∏*

Correct Answer:- Option-A

Question60:-Which of the following are the Quantum mechanics methods used in computational chemistry

A:-Molecular mechanics method and Ab initio method

B:-Ab initio method and DFT

C:-Semi Empirical method and molecular dynamics method

D:-DFT and molecular mechanics method

Correct Answer:- Option-B

Question61:-Which of the following statement(s) are correct
A. Glass electrode only compares pH values while the hydrogen electrode measure pH absolutely
B. The pH values measured by quinhydrone electrode are very accurate even in the presence of oxidising ions
C. Potentiometry is a method of electroanalysis is used to find the concentration of a solute in a solution
D. Amperometry is the technique to detect the ions in a solution depending on electric voltage or changes in redox potential

A:-A, B and C are correct

B:-A, C and D are correct

C:-A, B and D are correct

D:-B, C and D are correct

Correct Answer:- Option-A

Question62:-The Electrokinetic phenomenon in which the movement of particles causes potential is

A:-Sedimentation potential

B:-Electroosmosis

C:-Streaming potential

D:-Electrophorosis

Correct Answer:- Option-C

Question63:-Which of the following is not suitable for Amperometry?

A:-Quantification of ons/mixture of ions

B:-Identification of polysaccharide

C:-Use as amperometric detector in HPLC

D:-It is based on the principle of polarography, with the exception that the voltage is maintained constant during the titration

Correct Answer:- Option-B

Question64:-The salts of a given metal can be arranged in order of their decreasing ability to remove lyophilic substances from colloidal solution. This series is called

A:-Hofmeister series

B:-Hardy series

C:-Helmoltz potential series

D:-Hydrotropic potential series

Correct Answer:- Option-A

Question65:-Identify the correct statements
A. During gelation there is a large increase in viscosity
B. Imbibation pressure breaks the soil around the seeds during germination

C. A small amount of electrolyte increases the zeta potential of lyophilic colloids
D. Critical Micellar concentration decreases as the molecular weight of a hydrocarbon chain increases

A:-A, B and C are correct

B:-A, B and D are correct

C:-A, C and D are correct

D:-A, B, C and D are correct

Correct Answer:- Option-B

Question66:-Identify the correct statements(s) from the following
A. Regioselectivity of the hydroboration step can be improved with bulky boranes
B. For mono-substituted cyclohexane, the equatorial conformer is more stable than the axial-conformer because of the 1,3- diaxal interaction
C. Hydroboration/Oxidation proceeds in an Anti-Markovnikov manner, where the hydrogen from BH_3 or BHR_2 attaches to the more substituted carbon
D. Addition of to a carbon carbon double bond is Markovinikov syn addition

A:-A, C and D are correct

B:-A, B and D are correct

C:-A, B and C are correct

D:-A, B, C and D are correct

Correct Answer:- Option-C

Question67:-If we consider trans-1-t-butyl-3 methylcyclohexane, in its most stable conformation, then the substituents at C1 and C3 are

A:-Axial and Equatorial positions respectively

B:-Equatorial and Equatorial positions respectively

C:-Equatorial and Axial positions respectively

D:-Axial and axial positions respectively

Correct Answer:- Option-C

Question68:-Which one of the following could be grouped as prochiral molecules?

A:-Pyruvic acid and propionic acid

B:-Pyruvic acid and methane

C:-Ethanol and Methane

D:-Propionic acid and methane

Correct Answer:- Option-A

Question69:-Cyclopentadiene is more acidic than cyclopentane, because

A:-Cyclopentadiene has conjugated double bonds and when it loses a H^+ , the resulting carbanion becomes planar

B:-Cyclopentadiene has double bond and of its structure is cyclic and non planar

C:-Cyclopentadiene has conjugated double and once deprotonated, the orbitals on the carbon atom would re-hybridize from sp^3 to sp^2 placing the lone-pair of

electrons in the new p-orbital making resulting the molecule aromatic

D:-Cyclopentadiene has conjugated double and once deprotonated, the orbitals on the carbon atom would re-hybridize from sp^3 to sp^2 making resulting the molecule anti atomatic

Correct Answer:- Option-C

Question70:-The mechanism of oxymercuration of an alkene to yield an alcohol follows

A:-Electrophilic Addition Reaction

B:-Nucleophilic Addition Reaction

C:-Free radical Addition Reaction

D:-Electrophilic substitution Reaction

Correct Answer:- Option-A

Question71:-The alkaloid pilocarpine extracted from the leaves of pilocarpus microphyllus is an

A:-Pyridine Alkaloid

B:-Isoquinoline Alkaloid

C:-Imidazole Alkaloid

D:-Piperidine Alkaloid

Correct Answer:- Option-C

Question72:-In IR spectraum of para nitro phenyl acetate, Carbonyl absorption band may range on

A:-1860 - 1865 cm^{-1}

B:-1760-1765 cm^{-1}

C:-1600 - 1625 cm^{-1}

D:-1650 - 1655 cm^{-1}

Correct Answer:- Option-B

Question73:-How many peaks could be expected in the proton decoupled ^{13}C NMR spectra of 1-methyl cyclohexene and methylcyclohexane respectively?

A:-Seven and Five

B:-Six and four

C:-Three and Five

D:-Seven and Four

Correct Answer:- Option-A

Question74:-Which one of the following group of compound belongs to Terpenes?

A:-Caravone, geraniol and Chrysene

B:-Chrysene, Geraniol and Myrcene

C:-Caravone, Geraniol and Cortisone

D:-Caravone, Geraniol and Myrcene

Correct Answer:- Option-D

Question75:-What is the correct order of λ_{max} for n-> Π* transition for the following organic groups, R-N=N-R, R-CN and R-NO_2 ?

A:-R-$NO_2 > R-CN = R-N = N-R$

B:-$R-CN < R-NO_2 < R-N = N-R$

C:-$R-NO_2 > R-CN > R-N = N-R$

D:-$R-N = N-R < R-CN < R-NO_2$

Correct Answer:- Option-B

Question76:-Which among the following statements are correct?
A. Ninhydrin is sprayed to locate amino acids and on applying ninhydrin amino acids will be appeared in pink to purple colour
B. The four main system in HPLC are mobile phase reservoirs Injector system, column and detector
C. Gas chromatography is a type of adsorption chromatography in which the mobile phase is a gas
D. Elutropic series is a series of various compounds in order of adsorbtion power for a given adsorbent

A:-A, B and D are correct

B:-A, C and D are correct

C:-A, B and C are correct

D:-A, B, C and D are correct

Correct Answer:- Option-C

Question77:-Which of the following set of reactions are given by citral?

A:-React with ozone semicarbazone and is optically active

B:-React with bisulphite, is optically active and heating with potassium bisulphate gives p-Cymene

C:-React with bisulphite, exhibit geometrical isomerism and heating with potassium bisulphite gives Levulinic aldehyde

D:-React with bisulphite, Ozone and exhibit geometrical isomerism

Correct Answer:- Option-D

Question78:-During ion exchange separation, ion exchange is favoured at higher concentration, when

A:-Resin and solution has lower positive charge

B:-Resin has higher positive charge and solution has same positive charge

C:-Resin has higher positive charge and solution has lower positive charge

D:-Resin has lower positive charge and solution has higher positive charge

Correct Answer:- Option-C

Question79:-Identify the wrong statement(s) from the following
A. In GC-MS the compounds to be analysed must be sufficienly volatile and thermally stable
B. The gas chromatograph utilises a capillary colomn which does not depend

upon colomn's dimension as well as the phase properties
C. Electrospray ionisation method in LC-MS can be used for highly polar, highly stable or thermally stable compounds
D. Carrier gas used in GC-MS are nitrogen helium argon and Hydrogen

A:-A and B are wrong

B:-B and C are wrong

C:-C and D are wrong

D:-A and D are wrong

Correct Answer:- Option-B

Question80:-Crypton is a natural terpenoid which

A:-Contains ten carbon atom and does not obey isoprene rule

B:-Contains eight carbon atom and obeys isoprene rule

C:-Contains eight carbon atom and does not obey isoprene rule

D:-Contains nine carbon atom and does not obey isoprene rule

Correct Answer:- Option-D

Question81:-Which among the following is the function of Chopper in AAS?

A:-To split the beam into two

B:-To filter impurities

C:-To convert steady light into pulsating light

D:-To reduce the sample into atomic sate

Correct Answer:- Option-C

Question82:-A $7.25\backslash 10^{-5}$M solution of potassium permanganate has a transmittance of 20% when measured in a 2.10 cm cell at a wavelength of 525nm. The molar absorptivity of potassium permangnate solution is $Lmol^{-1}cm^{-1}$

A:-0.0459×10^{-5}

B:-4.59×10^{-3}

C:-0.459×10^{-5}

D:-45.9×10^{-3}

Correct Answer:- Option-B

Question83:-If DTA of $CaC_2O_4.H_2O$ is carried out in an inert atmosphere, the number of exothermic peaks are

A:-0

B:-1

C:-2

D:-3

Correct Answer:- Option-A

Question84:-Statement I : SEM is least appropriate for small particles
Statement II: Small nanoparticles contribute very little to the signal obtained by SEM. Find the correct option from the following

A:-Statement I is correct and Statement II is incorrect

B:-Statement I is correct and Statement II is the correct explanation for statement I

C:-Statement I is correct and Statement II is not the correct explanation for statement I

D:-Both statements are incorrect

Correct Answer:- Option-B

Question85:-Which of the following is a greener route to produce ethanol commercially?

A:-Catalytic cracking of ethanol

B:-Dehydrogenation of ethylene

C:-Steam of reforming of methanol

D:-Oxidation of ethene with an ionic catalyst

Correct Answer:- Option-D

Question86:-The term Cryptand refers to

A:-Macrocyclic ligands with nitrogen donor

B:-Macrocyclic ligands with sulphur and nitrogen donor

C:-Macromolecules with nitrogen and oxygen donor

D:-Aliphatic ligands with nitrogen, sulphur and oxygen donor

Correct Answer:- Option-C

Question87:-Which of the following is an anion receptor?

A:-Carboxy peptidase A

B:-Crown ether

C:-Valinomycin

D:-Cryptand

Correct Answer:- Option-A

Question88:-Which enzyme regulates the external signal flapping in the molecular switches?

A:-Trypsin

B:-Helicase

C:-Kinase

D:-DNA polymerase

Correct Answer:- Option-C

Question89:-Supramolecular Calixarenes contain

A:-COOH

B:-NH

C:-CHO

D:-OH

Correct Answer:- Option-D

Question90:-Molecular Tweezers is primarily concerned with

A:-Thermodynamics

B:-Non covalent bond

C:-Dative bond

D:-Covalent bonding

Correct Answer:- Option-B

Question91:-Predict the correct order of magnetic moment for the following geometry pf Ni(II) complexes

A:-Square planar < Octahedral < Tetrahedral

B:-Octahedral < Tetrahedral < Square planar

C:-Tetrahedral< Square planar < Octahedral

D:-Square planar <Tetrahedral < Octahedral

Correct Answer:- Option-A

Question92:-Which of the following statement is incorrect about Zeise's salt?

A:-Oxidation state of Pt in Zeise's sa;t is +2

B:-Zeise's salt is diamagnetic in nature

C:-All the Pt-Cl bond length in Zeise's salt are not equal

D:-C-C bond length on ethylene moirty on Zeise's salt is longer than ethylene molecule

Correct Answer:- Option-C

Question93:-Indicate the number of Mossbauer peaks in the spectrum of $Fe_3(CO)_{12}$

A:-0

B:-1

C:-2

D:-3

Correct Answer:- Option-D

Question94:-How many metal-metal bonds are present in $\left[CpMo(CO)_2\right]_2$?

A:-1

B:-2

C:-3

D:-4

Correct Answer:- Option-C

Question95:-Ferrocene cannot undergo which of the following reactions?

A:-Lithiation

B:-Diels-Alder reaction

C:-Redox reaction

D:-Alkylation

Correct Answer:- Option-B

Question96:-The order of CO infrared stretching frequencies in $Ni(CO)_4, Ni(CO)_3(PMe_3), Ni(CO)_2(PMe_3)_2$ is

A:-$Ni(CO)_2(PMe_3)_2 > Ni(CO)_3(PMe_3) > Ni(CO)_4$

B:-$Ni(CO)_4 > Ni(CO)_3(PMe_3) > Ni(CO)_2(PMe_3)_2$

C:-$Ni(CO)4 > Ni(CO)_2(PMe_3)_2 > Ni(CO)_3(PMe_3)$

D:-$Ni(CO)_2(Pme_3)_2 \approx Ni(CO)_3(PMe_3) > Ni(CO)_4$

Correct Answer:- Option-B

Question97:-The oxidation state of iron in methemoglobin is

A:-zero

B:-Two

C:-Three

D:-Four

Correct Answer:- Option-C

Question98:-If $Na^+ - K^+$ ATPase pumps 6 Na^+ out of the cell and 4 K^+ into the cell, the number of ATP consumed

A:-1

B:-2

C:-3

D:-4

Correct Answer:- Option-B

Question99:-Identify the correct statement for the EPR spectrum of $VO(acac)_2$ [with square pyramidal geometry at Vanadium] at 77K [I value of $^{51}V = \frac{7}{2}$]

A. It has two g values
B. It has one g value
C. It has 8 lines only
D. It has 2 patterns of 8 lines

A:-A and D

B:-A and C

C:-B and C

D:-B and D

Correct Answer:- Option-A

Question100:-For the given complex $\left[UO_2(NO_3)_3\right]^-$, the coordination number and

geometry respectively, are

A:-5 and square pyramidal

B:-8 and square antiprism

C:-8 and hexagonal bipyramidal

D:-5 and trigonal bipyramidal

Correct Answer:- Option-C