परीक्षेचे नांव : सहायक प्राध्यापक, रसायनशास्त्र, **परीक्षेचा दिनांक : 09 फेब्रुवारी, 2014**

महाराष्ट्र शिक्षण सेवा (महाविद्यालयीन शाखा), गट -अ, चाळणी परीक्षा-2013

विषय : रसायनशास्त्र

महाराष्ट्र लोकसेवा आयोगामार्फत सहायक प्राध्यापक, रसायनशास्त्र, महाराष्ट्र शिक्षण सेवा (महाविद्यालयीन शाखा), गट -अ, चाळणी परीक्षा-२०१३ या चाळणी परीक्षेच्या प्रश्नपत्रिकेची उत्तरतालिका उमेदवारांच्या माहितीसाठी संकेतस्थळावर प्रसिध्द करण्यात आली होती. त्यासंदर्भात उमेदवारांनी अधिप्रमाणित (Authentic) स्पष्टीकरण / संदर्भ देऊन पाठविलेली लेखी निवेदने, तसेच तज्ज्ञांचे अभिप्राय विचारात घेऊन आयोगाने उत्तरतालिका सुधारित केली आहे. या उत्तरतालिकेतील उत्तरे अंतिम समजण्यात येतील. यासंदर्भात आलेली निवेदने विचारात घेतली जाणार नाहीत व त्याबाबत कोणताही पत्रव्यवहार केला जाणार नाही, याची कृपया नोंद घ्यावी.

उत्तरतालिका - KEY

MPSC

Notations:

1. Options shown in green color are correct.
2. Options shown in red color are incorrect.

Group A

Number of optional sections to be attempted: 0, Group Maximum duration : 0, Group Minimum duration : 60, Revisit allowed for view? : No, Revisit allowed for edit? : No, Break time: 0

Assistant Professor Chemistry

Section type : Online, Number of Questions to be attempted:100, Mandatory or Optional: Mandatory

Subsection : 1, Question Shuffling Allowed : Yes

Question id : 4103 Question Type : MCQ

In which case, a reaction is possible at any temperature?

Options :

1. $\Delta H < 0, \Delta S > 0$
2. $\Delta H < 0, \Delta S < 0$
3. $\Delta H > 0, \Delta S > 0$
4. $\Delta H = 0, \Delta S = 0$

Question id : 4104 Question Type : MCQ

Molar heat capacity of water in equilibrium with ice at constant pressure is

Options :

1. 0
2. ∞
3. $40.45\ kJ\ K^{-1}mol^{-1}$

3. $75.48\ kJ\ K^{-1}mol^{-1}$

4.

Question id : 4105 Question Type : MCQ

Heats of combustion of CH_4, C_2H_4 and C_2H_6 are −890, −1411 and − 1560 kJ/mole respectively. Which has the lowest fuel value in kJ/g?

Options :

1. CH_4
2. C_2H_4
3. C_2H_6
4. All has same value.

Question id : 4106 Question Type : MCQ

For an ideal solution formed by mixing of two pure liquids A and B

Options :

1. $\Delta H_{mixing} > 0$
2. $\Delta H_{mixing} < 0$
3. $\Delta H_{mixing} = 0$
4. $\Delta S_{mixing} = 0$

Question id : 4107 Question Type : MCQ

The EMF and Gibbs free energy of the following half cells are

$A^{n}{}_1^{+} + n_1e^- \rightarrow A;$ $E_1, \Delta G_1$

$B^{n}{}_2^{+} + n_2e^- \rightarrow B;$ $E_2, \Delta G_2$

The EMF (E_3) of the following cell will be

$$A^{n}{}_{1}^{+} + B^{n}{}_{2}^{+} + (n_1 + n_2)e^{-} \rightarrow A + B; \quad E_3, \Delta G_3$$

Options :

1. $E_1 + E_2$
2. $n_1E_1 + n_2E_2$
3. n_1E_1 / n_2E_2
4. $(n_1E_1 + n_2E_2) / (n_1 + n_2)$

Question id : 4108 Question Type : MCQ

For the following system in equilibrium

$$N_2(g) + 3H_2(g) \leftrightarrow 2NH_3(g)$$

The number of Components (C), Phases (P) and the Degree of freedom (F) respectively will be

Options :

1. 1, 2, 3
2. 2, 1, 3
3. 2, 3, 1
4. 3, 2, 1

Question id : 4109 Question Type : MCQ

Gibbs Duhem equation is;

Options :

1. $n_1d\mu_1 + n_2d\mu_2 = 0$
2. $n_1d\mu_1 - n_2d\mu_2 = 0$
3. $\mu_1dn_1 + \mu_2dn_2 = 0$
4. $\mu_1dn_1 - \mu_2dn_2 = 0$

Question id : 4110 Question Type : MCQ

The standard reduction potential values of three metallic cations X, Y, and Z are 0.52V,−3.03V, and −1.18V respectively. The order of reducing power of the corresponding metal is;

Options :

Options :

1. $X > Y > Z$
2. $Z > Y > X$
3. $Z > X > Y$
4. $Y > Z > X$

Question id : 4111 Question Type : MCQ

The relation between the chemical potential of an ideal gas in a mixture (μ_i) and pure gas (μ_i^*) is:

Options :

1. $\mu_i > \mu_i^*$
2. $\mu_i < \mu_i^*$
3. $\mu_i = \mu_i^*$
4. $\mu_i \geq \mu_i^*$

Question id : 4112 Question Type : MCQ

The drag coefficients in Onsager reciprocal theory are

Options :

1. Positive
2. Negative
3. Zero
4. either positive or negative

Question id : 4113 Question Type : MCQ

The ionic strength of a solution of 0.1 molal in KCl and 0.2 molal in K_2SO_4 is:

Options :

1. 0.7
2. 1.7
3. 2.7
4. 7.7

Question id : 4114 Question Type : MCQ

If X_1, X_2 and X_3 are the mole fraction of the components in a ternary ideal gas mixture, the molar

free energy of mixing ($\Delta G_{mix,m}$) is minimum when:

Options :

1. $X_1 + X_2 + X_3 = ⅓$
2. $X_1 + X_2 + X_3 = 3$
3. $X_1 = X_2 = X_3 = ⅓$
4. $X_1 = X_2 = X_3 = 3$

Question id : 4115 Question Type : MCQ

For the steady state close to equilibrium, entropy production is:

Options :

1. Maximum
2. Minimum
3. Zero
4. cannot be predicted.

Question id : 4116 Question Type : MCQ

The chemical reactions are spontaneous when the equilibrium constant (K) is:

Options :

1. > 1
2. < 1
3. 0
4. $=1$

Question id : 4117 Question Type : MCQ

The partial molar volumes of ethanol and water in a solution containing 5.0 moles of water and 1.05 moles of ethanol are 11.839×10^{-3} dm^3 and 55.10×10^{-3} dm^3, respectively. The nature of the solution is (density of ethanol is 0.7893 kg dm^{-3}):

Options :

1. Ideal
2. Non-ideal

2.

Azeotropic

3.

Non- azeotropic

4.

Question id : 4118 Question Type : MCQ

The activity coefficient of 0.0992 M NaCl at 25 °C is 0.782. The effective concentration of the solution will be:

Options :

1. 0.127 M

2. 7.883 M

3. 0.881 M

4. 0.0776 M

Question id : 4119 Question Type : MCQ

The enthalpy and entropy change for a chemical reaction are -2.5×10^{-3} cal and 7.4 cal deg^{-1} respectively. Predict the nature of the reaction at 298K:

Options :

1. Reversible

2. Irreversible

3. Spontaneous

4. Non-spontaneous

Question id : 4120 Question Type : MCQ

The entropy of a substance is maximum in:

Options :

1. Gaseous state

2. Liquid state

3. Solid state

4. Liquid crystal state

Question id : 4121 Question Type : MCQ

The non-equilibrium thermodynamics is defined as the thermodynamics of:

Options :

1. Open systems

2. Steady state

3. Irreversible processes

4. Open System, steady state & Irreversible process

Question id : 4122 Question Type : MCQ

Spontaneous adsorption of a gas on solid surface is an exothermic process because

Options :

1. ΔH increases for system

2. ΔS increases for gas

3. ΔS decreases for gas

4. ΔG increases for gas

Question id : 4123 Question Type : MCQ

The specific conductivity of N/10 KCl solution is 0.00278 per ohm at 25°C temperature. The resistance of this solution when placed in the cell is 500 ohm. The cell constant for the system will be:

Options :

1. 1.79×10^{5}

2. 0.556×10^{-5}

3. 1.79×10^{-5}

4. 1.39

Question id : 4124 Question Type : MCQ

The molecular weight obtained by light scattering is

Options :

1. Number Average

2. Weight Average

3. Viscosity Average

4. Z-Average

Question id : 4125 Question Type : MCQ

The value of α in Mark Houwink equation $[\eta]=KM^{\alpha}$ in theta solvent is

Options :

1. 1
2. 0.5
3. 0
4. 0.8

Question id : 4126 Question Type : MCQ

The determination of weight average molecular weight from light scattering involves a double extrapolation on a grid like figure termed as

Options :

1. Turbidity plot
2. Molecular weight distribution curve
3. Gaussian plot
4. Zimm plot

Question id : 4127 Question Type : MCQ

In the kinetics of addition polymerization, molecular weight is

Options :

1. Directly proportional to monomer concentration
2. Inversely proportional to initiator concentration
3. Directly proportional to initiator concentration
4. Inversely proportional monomer concentration

Question id : 4128 Question Type : MCQ

The polymerization technique which offers the problem of heat dissipation is

Options :

1. Suspension polymerization
2. Emulsion polymerization
3. Solution polymerization
4. Bulk polymerization

Question id : 4129 Question Type : MCQ

Fermi energy level for *p*-type extrinsic semiconductors lies

Options :

1. At middle of the band gap
2. Close to valence band
3. Close to conduction band
4. Above the valence band

Question id : 4130 Question Type : MCQ

Which of the following oxides behaves as conductor or insulator depending upon temperature?

Options :

1. BeO
2. SiO_2
3. TiO_3
4. MgO

Question id : 4131 Question Type : MCQ

The defect introduced by doping is

Options :

1. Dislocation defect
2. Schottky defect
3. Frenkel defects
4. Electronic defect

Question id : 4132 Question Type : MCQ

The conservative movement of dislocations is

Options :

1. Slip
2. Climb
3. Both slip and climb
4. random

Question id : 4133 Question Type : MCQ

Thermodynamically stable defects

Options :

1. Point defects

1.
2. Line defects
3. Surface defects
4. Volume defects

Question id : 4134 Question Type : MCQ

Stacking fault energies are in the range of

Options :

1. $0.01\text{-}0.1\ J/m^2$
2. $0.01\text{-}0.1\ J/cm^2$
3. $0.1\text{-}10\ J/m^2$
4. $0.01\text{-}10\ J/m^2$

Question id : 4135 Question Type : MCQ

Which of the following defect is also known as dislocation defect?

Options :

1. Simple interstitial defect
2. Frenkel defect
3. Schottky defect
4. Metal deficiency defect

Question id : 4136 Question Type : MCQ

Yellow colour in sodium chloride is due to the creation of

Options :

1. H-Center
2. F-Center
3. V-Center
4. Z-center

Question id : 4137 Question Type : MCQ

Which of the following oxides shows electrical properties like metals?

Options :

1. SiO_2
2. MgO

2.

3. $SO_2(s)$

4. CrO_2

Question id : 4138 Question Type : MCQ

FeO (s) not formed in stoichiometric composition because

Options :

1. Fe^{2+} ions are replaced by two Fe^{3+} ions

2. Fe^{2+} occupy interstitial sites

3. Oxide ions are replaced by two Fe^{2+} ions

4. Oxide ions occupy the interstitial sites

Question id : 4139 Question Type : MCQ

The process that converts an atom from one element to another when the nuclei is bombarded with high energy electrons is termed as

Options :

1. Artificial transmutation

2. Natural transmutation

3. Hyper transmutation

4. Atomic transmutation

Question id : 4140 Question Type : MCQ

A lightweight isotope is likely to be stable if the ratio of protons to neutrons in its nucleus is :

Options :

1. 1:2.

2. 2:1

3. 1:1

4. 5:1

Question id : 4141 Question Type : MCQ

When the isotope $^{238}_{91}Pa$ decays by beta emission, the isotope formed is

Options :

1. $^{234}_{89}Ac$

^{238}..

2. $^{\quad}_{92}U$
3. $^{237}_{92}U$
4. $^{238}_{90}Th$

Question id : 4142 Question Type : MCQ

The radioisotope technetium-99 is often used as a radiotracer to detect disorders of the body. It has a half-life of 6.01 hours. If a patient received a 25.0-mg dose of this isotope during a medical procedure, how much would remain 48.0 hours after the dose was given?

Options :

1. 0.053 mg
2. 0.098 mg
3. 0.048 mg
4. 0.032 mg

Question id : 4143 Question Type : MCQ

Diagnostics injections of radioisotopes used in medicine have

Options :

1. Short half-lives and are slowly eliminated from the body
2. Long half lives and are rapidly eliminated from the body
3. Short half-lives and are rapidly eliminated from the body
4. Long half lives and are slowly eliminated from the body

Question id : 4144 Question Type : MCQ

A sample of ^{99}Tc decays to 0.5 grams in 1.49×10^6 years .What is the mass of the original sample? (Question Cancelled)

Options :

1. 32 g
2. 8 g
3. 128 g
4. 64 g

Question id : 4145 Question Type : MCQ

Geological dating can be done by comparing mineral remains of which of the following two isotopes?

Options :

1. U-238 and U-235
2. U-238 and Co-60
3. U-238 and Pb-206
4. C-14 and Pb-206

Question id : 4146 Question Type : MCQ

What is the half life of a radio isotope that undergoes 2 half-life periods in 180 ms?

Options :

1. 90ms
2. 360 ms
3. 2 ms
4. 170 ms

Question id : 4147 Question Type : MCQ

Which procedure is based on half-life radio isotope?

Options :

1. Radiating to kill cancer cells
2. Dating to determine age
3. Counting to determine level of radioactivity
4. Accelerating to increase kinetic energy

Question id : 4148 Question Type : MCQ

The limiting current in a linear sweep voltammogram is related to

Options :

1. The standard reduction potential for the redox couple under investigation
2. The reduction potential of the reference electrode
3. The point at which concentration polarization begins
4. The concentration of the analyte of interest

Question id : 4149 Question Type : MCQ

Which of the following forms of electrochemistry seeks to obtain the condition of full polarization?

Options :

1. potentiometry
2. voltammetry

2. coulometry
3. electrogravimetry
4.

Question id : 4150 Question Type : MCQ

A good reason to increase flow rate in chromatography is to

Options :

1. minimize band broadening due to mobile phase mass transport.
2. to minimize band broadening due to mass transport in the stationary phase.
3. to minimize eddy diffusion and column bleed.
4. to minimize band broadening due to longitudinal diffusion.

Question id : 4151 Question Type : MCQ

The finding by nephelometry of low IgG, IgA, and IgM levels in a patient with a monoclonal protein of gamma mobility (8 g/dl) and no Bence Jones protein should first be followed by:

Options :

1. repeating the assay of IgG, IgA, and IgM with higher dilutions of serum.
2. immunofixation using anti-IgD and anti-IgE.
3. repeating the assay with different antisera.
4. reevaluating the quality control in your laboratory.

Question id : 4152 Question Type : MCQ

The most proper description of atomic spectroscopy is :

Options :

1. It is a flame atomic absorption spectroscopy that employs low atomization temperature to prevent oxidation of the atoms,
2. It is an absorption spectroscopy in which the argon-plasma exhibits high sensitivity in detection because of the prevention of collision between atoms by argons,
3. It is an absorption spectroscopy in which absorption and emission spectra show similar band intensities for an atom,
4. It is an absorption spectroscopy in which pressure broadening refers to the uncertainty in measuring the transition energy

Question id : 4153 Question Type : MCQ

Which of the following measurements involves electrolysis:

Options :

1. The measurement of pH with a pH electrode
2. A redox titration using a redox indicator
3. A stripping analysis of uranium in water
4. A titration in which the analyte solution potential is measured as a function of added titrant relative to the standard hydrogen electode.

Question id : 4154 Question Type : MCQ

DTA is utilized in polymer research in determining

Options :

1. Degree of crystallinity
2. Viscosity
3. Solubility
4. Molecular weight

Question id : 4155 Question Type : MCQ

In GPC the mobile and stationary phases are

Options :

1. solid and liquid
2. liquid and liquid
3. solid and gas
4. single liquid acts as both phases

Question id : 4156 Question Type : MCQ

TGA measures the changes in material size as a function of increasing

Options :

1. temperature
2. concentration
3. viscosity
4. mass

Question id : 4157 Question Type : MCQ

π donor complexes of d^3 ions tend to be more reactive than d^3 π–acceptor complexes because:

Options :

. the CFSE is more negative for the π–donor complex

1. [illegible]

2. the CFSE is less negative for the π–donor complex

3. the π–donor complex has more filled antibonding orbitals than the π–acceptor complex

4. the π–donor complex has fewer filled antibonding orbitals than the π–acceptor complex

Question id : 4158 Question Type : MCQ

The most common oxidation state for ions of the inner transition elements is

Options :

1. +2

2. +4

3. +3

4. +5

Question id : 4159 Question Type : MCQ

In the spectrochemical series, which one of the following ligands has the strongest field?

Options :

1. H_2O

2. CN^-

3. NH_3

4. OH^-

Question id : 4160 Question Type : MCQ

Which of the following ligands could participate in linkage isomerism?

Options :

1. NH_3

2. H_2O

3. NO_2^-

4. NH_4^+

Question id : 4161 Question Type : MCQ

The oxidation number and coordination number of cobalt in the compound $K[Co(C_2O_4)_2(H_2O)_2]$ (where $C_2O_4^{2-}$ = oxalate) will be:

Options :

1. 3 and 6

1.

2. –1 and 4

3. –1 and 6

4. 3 and 4

Question id : 4162 Question Type : MCQ

The correct formula for pentaamminechlorocobalt(III) chloride.is

Options :

1. $[Co(NH_3)_5Cl]Cl$

2. $[Co(NH_3)_5Cl]Cl_2$

3. $[Co(NH_3)_5Cl]Cl_3$

4. $[Co(NH_3)_5Cl]Cl_4$

Question id : 4163 Question Type : MCQ

Iron(III) forms an octahedral complex with the ligand CN^-. How many unpaired electrons are in the *d* orbitals of iron?

Options :

1. 1

2. 3

3. 5

4. 7

Question id : 4164 Question Type : MCQ

Which of the following octahedral complexes should have the largest crystal field splitting energy, Δ?

Options :

1. $[Cr(en)_3]^{3+}$ (en = ethylenediamine)

2. $[Cr(SCN)_6]^{3-}$

$[Cr(CN)_6]^{3-}$

3.

$[Cr(NH_3)_6]^{3+}$

4.

Question id : 4165 Question Type : MCQ

The crystal field splitting energy, Δ,

Options :

is larger for tetrahedral complexes than for octahedral complexes.

1.

1. depends on the metal but not on the ligand.
2. determines the color of a complex.
3. determines the charge of a complex.
4.

Question id : 4166 Question Type : MCQ

. 10.0 mL of a 0.100 mol/L solution of a metal ion M^{2+} is mixed with 10.0 mL of a 0.100 mol/L solution of a ligand L. A reaction occurs in which the product is ML_3^{2+}. Approximately, what is the maximum concentration of ML_3^{2+}, in mol/L, which could result from this reaction?

Options :

1. 0.100
2. 0.050
3. 0.033
4. 0.017

Question id : 4167 Question Type : MCQ

A transition element with stable oxidation states of +2, +3, +4, +5, and +6.will form a covalent bond with chlorine in the oxidation state of :

Options :

1. +2
2. +3
3. +4
4. +5

Question id : 4168 Question Type : MCQ

Which of the following ions forms only the high-spin state in an octahedral complex?

Options :

1. Cr^{2+}
2. Mn^{4+}
3. Fe^{3+}

Co^{3+}

4.

Question id : 4169 Question Type : MCQ

Which of the following ligands is most likely to form a high spin octahedral complex with cobalt(II)?

Options :

CN^-

1.

I^-

2.

en (ethylenediamine)

3.

NO_2^-

4.

Question id : 4170 Question Type : MCQ

The highest possible oxidation state for palladium, Pd is

Options :

+4

1.

+2

2.

+6

3.

+1

4.

Question id : 4171 Question Type : MCQ

Which type of isomerism is not possible in a coordination compound of square planar geometry?

Options :

Linkage

1.

Optical

2.

Coordination

3.

Geometric

4.

Question id : 4172 Question Type : MCQ

The best description of the C_8H_8 ligand in the compound $(C_8H_8)Ru(CO)_3$ is

Options :

1. It is bonded in an η^4-manner to the Ru atom, but one ^1H NMR signal is observed in the limiting high temperature spectrum
2. It is bonded in an η^8-manner to the Ru atom and one ^1H NMR signal is observed over a range of temperatures
3. It is bonded in an η^3-manner to the Ru atom and the ^1H NMR spectrum is consistent with a stereochemically non-rigid molecule
4. It is bonded in an η^2-manner to the Ru atom and the ^1H NMR spectrum is consistent with a static structure

Question id : 4173 Question Type : MCQ

A certain transition metal complex has the formula MX_4^{2+}. If the metal ion has a d^8 electron configuration, what is the shape of the complex?

Options :

1. octahedral
2. square pyramid
3. square planar
4. tetrahedral

Question id : 4174 Question Type : MCQ

Which of the following molecule is not an aromatic one?

Options :

1. Pyrene
2. Coronone
3. Cyclooctatetraene
4. Benzene.

Question id : 4175 Question Type : MCQ

A typical C_{60} molecule consists of:

Options :

1. 20 hexagons and 12 pentagons.
2. 12 hexagons and 20 pentagons.
3. 14 hexagons and 4 pentagons.
4. 10 hexagons and 7 pentagons.

4.

Question id : 4176 Question Type : MCQ

How many faces are there in the icosahedral geometry of a C_{60} molecule:

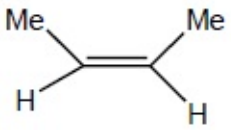
Options :

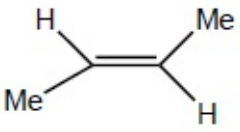
1. 34
2. 32
3. 36
4. 30

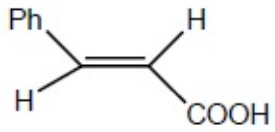
Question id : 4177 Question Type : MCQ

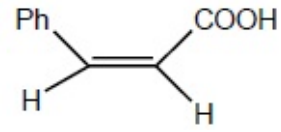
. Which of the following will give *meso* form with Br_2?

Options :

1. 

2. 

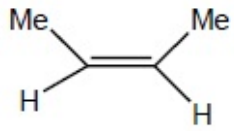
3. 

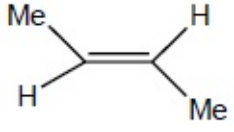
4. 

Question id : 4178 Question Type : MCQ

Which of the following will form a (±)-mixture with Br_2?

Options :

1. 

2. 

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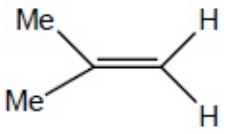
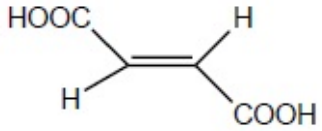


3.



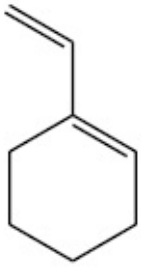
4.

Question id : 4179 Question Type : MCQ

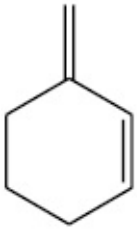
Diene undergoing Diels-Alder reaction with maleic anhydride is:

Options :

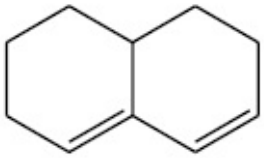
1.



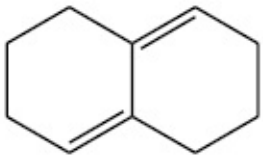
2.



3.

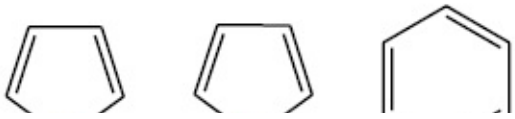


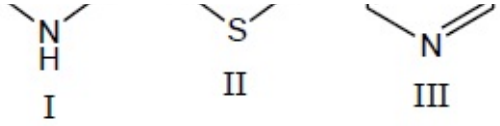
4.



Question id : 4180 Question Type : MCQ

The decreasing order of reactivity of the following compounds towards electrophiles is



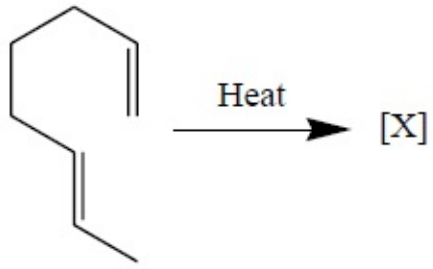


Options :

1. II > III > I
2. II > I > III
3. III > I > II
4. I > II > III

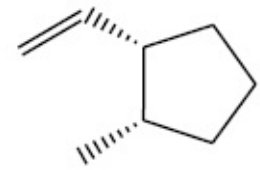
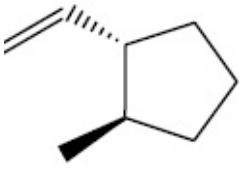
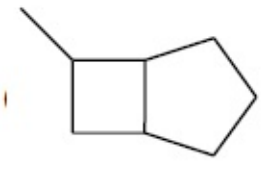
Question id : 4181 Question Type : MCQ

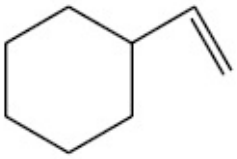
In the reaction,



The major product [X] is

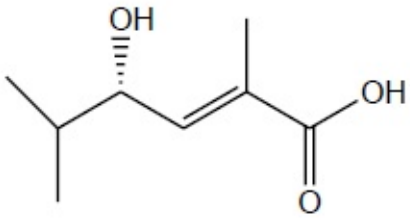
Options :

1. 
2. 
3. 

4. 

Question id : 4182 Question Type : MCQ

. For the compound



the stereochemical notations are

Options :

1. 2Z, 4R

2. 2Z, 4S

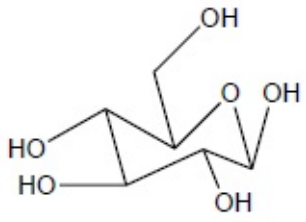
3. 2E, 4R

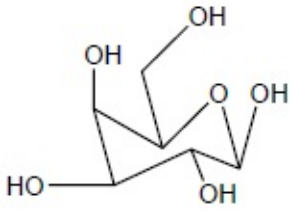
4. 2E, 4S.

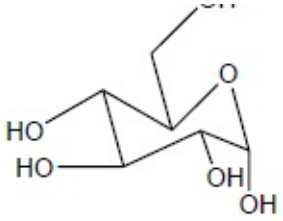
Question id : 4183 Question Type : MCQ

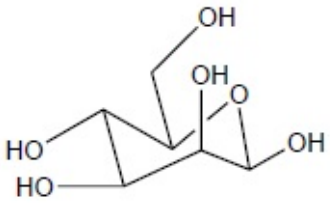
β-D-glucose is represented as

Options :

1. 

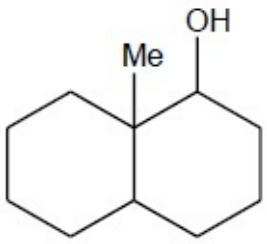
2. 

3. 

4. 

Question id : 4184 Question Type : MCQ

The configurations at three chiral centers in in following bicyclodecanol are- (Question Cancelled)



Options :

1. 1S, 2S, 6R

2. 1S, 2S, 6S

3. 1R, 2R, 6R

4. 1R, 2S, 6R

Question id : 4185 Question Type : MCQ

The initiation and termination codons respectively are

Options :

1. AUG and UAG

2. UAG and AUG

3. UCC and UAG

4. AUG and UCC.

Question id : 4186 Question Type : MCQ

. Which of the following is not present in DNA?

Options :

1. Adenine

2. Guanine

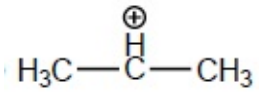
3. Thymine

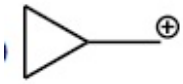
4. Thiamine

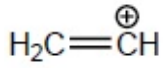
Question id : 4187 Question Type : MCQ

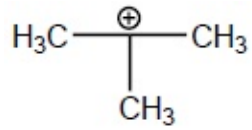
Which of the following is a non-classical carbocation?

Options :

1. 

2. 

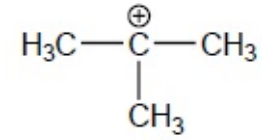
3. 

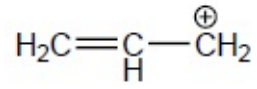
4. 

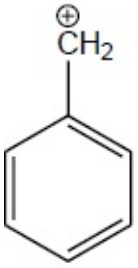
Question id : 4188 Question Type : MCQ

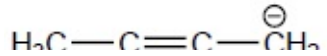
Which one of the following carbocations is the most stable in gaseous state?

Options :

1. 

2. 

3. 



4. 

Question id : 4189 Question Type : MCQ

Geometries of methyl and trifluoromethyl free radicals, respectively are -

Options :

1. Planar and pyramidal

2. Pyramidal and planar

3. Planar and tetrahedral

4. Pyramidal and tetrahedral

Question id : 4190 Question Type : MCQ

Diels-Alder reaction of cyclopentadiene occurs at the highest rate with -

Options :

1. Ethylene

2. 2-Butene

3. Succinic anhydride

4. Maleic anhydride

Question id : 4191 Question Type : MCQ

Which one of the following compounds can be found in proteins?

Options :

1. Ribose

2. Glycine

3. Adenine

4. Isoprene

Question id : 4192 Question Type : MCQ

The cane sugar used for the preparation of sweets is -

Options :

1. A polysacharide

A disacharide

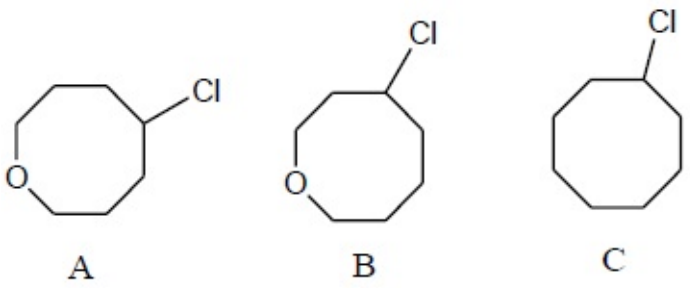
2. A pentasacharide

3. A pentose sugar

4.

Question id : 4193 Question Type : MCQ

The rate of solvolysis increases in the order of -



A B C

Options :

A> B> C

1.

C> B> A

2.

A>C>B

3.

B>C>A

4.

Question id : 4194 Question Type : MCQ

Based on the behavior of metalloenzymes, consider the following statements.

A) In the enzymes, the zinc activates O_2 to form peroxide species.

B) In the enzymes, the zinc activates H_2O and provides a zinc bound hydroxide.

c) In the oxidases, the iron activates O_2 to break the bonding between the two oxygens.

D) Zinc ion acts as a nucleophile and attacks at the peptide carbonyl.

The set of correct statements are

Options :

A and B

1.

B and D

2.

B and C

3.

C and D

4.

Question id : 4195 Question Type : MCQ

The dihedral angle between the hydroxyl groups in the most stable conformation of 1,2-ethanediol is -

Options :

180°

1.

60°

2.

240°

3.

0°

4.

Question id : 4196 Question Type : MCQ

Michael Reaction is a/an

Options :

1. 1,2 Addition reaction

2. 1,4 Addition reaction

3. 1,3 Addition reaction

4. 1,5 Addition reaction

Question id : 4197 Question Type : MCQ

Glucose and fructose can be differentiated by -

Options :

Tollens reagent

1.

Fehling solution

2.

Benedict solution

3.

Br_2 water

4.

Question id : 4198 Question Type : MCQ

The most reactive saturated hydrocarbon is -

Options :

Cylobutane

1.

Cyclohexane

2.

Cyclopropane

3.

Propane

4.

Question id : 4199 Question Type : MCQ

Match the following

1. $(Ph_3P)RhCl$	(a) Alkylation
2. DDQ	(b) Hydrogenation
3. LDA	(c) Epoxidation
4. CH_3COOOH	(d) Dehydrogenation

Options :

1-c, 2-d, 3-a, 4-b

1.

1-d, 2-a, 3-b, 4-c

2.

1-b, 2-d, 3-a, 4-c

3.

1-a, 2-d, 3-b, 4-c

4.

Question id : 4200 Question Type : MCQ

Histamine is a derivative of

Options :

Pyridine

1.

Imidazole

2.

Purine

3.

Pyrazole

4.

Question id : 4201 Question Type : MCQ

Which of the following solvent is a heterocyclic compound?

Options :

THF

1. DMF

2. Diglyme

3. DMSO

4.

Question id : 4202 Question Type : MCQ

In Fischer Indole Synthesis, which step doesn't occur.

Options :

[3,3] sigmatropic Reaarangement

1. Cyclization with the formation of N-C_2 bond

2. Elimination of NH_3

3. Elimination of CO_2

4.