PU Ph D Chemistry

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122 PU_2015_107
Predict the correct combination for Zeise's salt.

- $K[PtCl_3(C_2H_2)]\cdot H_2O$, square planar, η^2- acetylene ligand
- $K[PtCl_3(C_2H_4)]\cdot H_2O$, square planar, η^2- ethylene ligand
- $K[PtCl_3(C_2H_2)]\cdot H_2O$, square planar, η^3- ethylene ligand
- $K[PtCl_3(C_2H_2)]\cdot H_2O$, square planar, η^2- ethyne ligand

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211 PU_2015_107
Cartesian coordinates are not used in solving schrodinger equation for hydrogen atom because:-

- kinetic energy terms are not separable
- potential energy terms are not separable
- particle motion along x, y and z direction are not inter dependent
- to fit the results in to the framework of Bohr's theory

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193 PU_2015_107
The density of O_2 at STP is 1.429 g/L. The standard molar volume of O_2 is:-

- 22.4 L/mol
- 11.2 L/mol
- 2.24 L/mol
- 224 L/mol

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142 PU_2015_107
What is the best reaction for synthesizing CH_3-CO-CH_2-CH_2-CH_2-CO-CH_3?

- Dieckmann condensation
- Robinson annulation
- Malonic ester synthesis
- Michael addition

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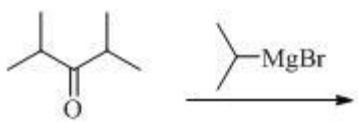
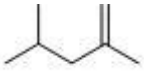
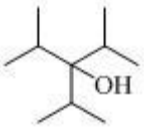
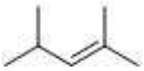
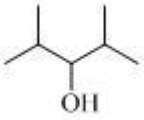
173 PU_2015_107
Predict the product formed in the following reaction:-



- 
- 

- 
- 

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154 PU_2015_107

Aniline failed to undergo bromination reaction with Br_2 in presence of AlB_3 as catalyst. Because:-

- Aniline forms strong complex with Br_2
- Aniline forms strong complex with $AlBr_3$
- Aniline is an electrophile
- $AlBr_3$ forms strong complex with Br_2

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136 PU_2015_107

Acidified dichromate solution reacts with H_2S to give green colored solution, this is due to:-

- oxidation of H_2S
- reduction of metal center
- reduction of H_2S
- oxidation of metal center

8 of 100

155 PU_2015_107

Which one of the following molecule possess high dipole moment?

- Carbon tetrachloride
- Chlorobenzene
- Cyclohexane
- 1,4-Dibromobenzene

9 of 100

160 PU_2015_107

How many stereoisomers are possible for butan-2,3-diol and how many of them are known to exhibit optical activity?

- 3 and 2
- 3 and 3
- 2 and 1
- 4 and 3

10 of 100

212 PU_2015_107

No. of quantum numbers that are solutions of the schrodinger H atom is:-

- 3
- 4
- 2
- 1

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137 PU_2015_107

XeF_6 reacts with silica or quartz to produce an explosive compound, which is:-

- XeO_3
- XeO_2F_2
- $XeOF_4$
- XeF_4

12 of 100

159 PU_2015_107

Reaction of acetophenone with I_2/NaOH followed by neutralization gives:-

- Phenylacetic acid and triiodomethane
- Acetic acid and triiodomethane
- Ethylbenzene and triiodomethane
- Benzoic acid and triiodomethane

13 of 100

182 PU_2015_107

At 1127 K and 1 atm pressure, a gaseous mixture of CO and CO_2 in equilibrium with solid carbon has 90.55% CO by mass $C(s) + CO_2(g) \rightleftharpoons 2CO(g)$. At the same temperature K_c for the reaction is:-

- 0.78 mol/L
- 0.156 mol/L
- 0.410 mol/L
- 1.414 mol/L

14 of 100

210 PU_2015_107

The degeneracy of energy levels in hydrogen is given by the formula:-

- n^2
- 2(n+l)
- $2n^2$
- 2l+1

15 of 100

157 PU_2015_107

Which one of the following molecule exhibits *cis*, *trans* isomerism?

- 2, 3-dimethyl-2-butene
- 2-Methyl-1-propene
- 1, 1-Dimethylcyclohexane
- 1, 2-dimethylcyclohexane

16 of 100

191 PU_2015_107

At the stopping potential, in photoelectric effect, the initial kinetic energy of electron is equal to the potential energy, which is mathematically represented by:-

- $mV^2_{stopping} = h\nu$
- $mc^2 = -eV_{stopping}$
- $\frac{1}{2}mv^2 = -V_{stopping}$
- $\frac{1}{2}mv^2 = -eV_{stopping}$

17 of 100

181 PU_2015_107

Consider a reaction $A \rightarrow B + C$. The rates of three separate experiments with [A] = 0.170 mol/L, 0.340 mol/L, and 0.680 mol/L were found to be 0.05 mol/L/hour, 0.10 mol/L/hour and 0.20 mol/L/hour respectively. Then the rate constant for the forward reaction is:-

- 0.294 h^{-1}
- 0.588 h^{-1}
- 0.123 h^{-1}

- $0.210\ h^{-1}$

18 of 100

156 PU_2015_107

Reaction of $[Ag(NH_3)_2]NO_3$ with butanal gives:-

- Butanoic acid
- Butan-1-imine
- Butanoic amide
- 1-Butanol

19 of 100

120 PU_2015_107

Copper(II) ion with lowest g > 2.04 in axial ESR spectrum shows significant exchange coupling.

- G = 4.0
- G < 4.0
- G ≠ 4.0
- G > 4.0

20 of 100

198 PU_2015_107

Which of the following is correct?

- zinc displaces tin from its solution
- zinc acts as cathode in Daniel cell
- in a Li-Zn coule, zinc acts as cathode
- copper will displace iron in solution

21 of 100

201 PU_2015_107

The coagulation of 10 ml of a colloidal sol of gold is completely prevented by addition of 0.25 g of substance X to it before adding 1 mL of 10% NaCl solution. The gold number of X is:-

- 250
- 2.5
- 0.25
- 25

22 of 100

179 PU_2015_107

How many isoprene units are present in citronellal?

- 4
- 2

- 3
- 1

23 of 100

110 PU_2015_107

Zinc and mercury do not show variable valency like d-block elements because:-

- their d-shells are complete
- they have only two electrons in the outermost subshell
- their d-shells are incomplete
- they are soft

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183 PU_2015_107

Given the electrode potentials and giff, the cell potential of the reaction is $2Fe^{3+} + 2I^- \rightarrow 2Fe^{2+} + I_2$ is:-

- 0.771 - 0.536 = 0.235*V*
- (2 x 0.771) - 0.536 = 1.006*V*
- (0.771 - 0.5 x 0.536) = 0.503*V*
- 0.536 - 0.771 = -0.235*V*

25 of 100

100 PU_2015_107

Number of M-M bond present in $Os_4(CO)_{14}$ is:-

- 7
- 6
- 2
- 3

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109 PU_2015_107

$Fe(CO)_4$ is isolobal to:-

- $Cr(CO)_4$
- $Ru(CO)_4$
- $Mn(CO)_4$
- $Cu(CO)_4$

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196 PU_2015_107

A 500 mL sample of the effluent from a water softner required 6 drops of standard soap solution to produce a permanent lather. The soap solution had been calibrated against an artificial hard water solution containing 0.130 g of $CaCl_2$ per litre. On the average, it required 28 drops of standard soap solution to lather 500 mL of the artificial solution. Then, the hardness of the effluent sample in terms of ppm of $CaCO_3$, is:-

- 26 ppm
- 0.123 ppm
- 123 ppm
- 38 ppm

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170 PU_2015_107

The hydrogens of CH_2 group in ethyl benzene are an example for:-

- Diastereotopichydrogens
- Enantiotopic hydrogens
- Homotopic hydrogens
- Allylic hydrogens

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194 PU_2015_107

The extra stability of lyophilic colloids is due to:-

- the larger size of the particles
- the smaller size of the particles
- a protective film of the dispersion medium on the particle
- charge on the particle

30 of 100

214 PU_2015_107

Lewis Octet rule is not violated in:-

- H_2O
- PCl_5
- BCl_3
- CO

31 of 100

184 PU_2015_107

The reaction of acidified aqueous potassium iodide with aqueous hydrogen peroxide $2I^-(aq)+H_2O_2(aq)+2H^+(aq)\rightarrow I_2(aq)+2H_2O(l)$ is thought to involve the following steps:-

$$H_2O_2+I^- \rightarrow H_2O+OI^- \quad (slow)$$
$$OI^-+H^+ \rightarrow HOI \quad (fast)$$
$$HOI+H^++I^- \rightarrow I_2+H_2O \quad (fast)$$

- the acid acts as a catalyst
- the iodide ion is oxidized by the hydrogen peroxide
- the rate equation for the reaction is = $k[H_2O_2][I^-]$
- the rate determination step is $H_2O_2 + I^- \rightarrow H_2O + OI^-$

32 of 100

185 PU_2015_107

The rate constant of a reaction is given by $k = 2.1 \times 10^{10} e^{-2700kT}$. It suggests:-

- the number of effective collisions are $2.1\times10^{10}\ cm^3 s^{-1}$
-
- half-life of the reaction increases with increase of temperature
- $\log k$ versus $\frac{1}{T}$ will be straight line with slope $= \frac{-2700}{2.303R}$
- $\log k$ versus $\frac{1}{T}$ will be straight line with slope $= \frac{-2700}{R}$
-

33 of 100

108 PU_2015_107

Tilley mechanism explains:-

- hydrogenation reaction
- hydroformylation
- olefin polymerization
- hydrosilylation

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203 PU_2015_107

Which of the following expressions is correct?

- $\left[\frac{\ln k_x}{\partial p}\right] = \frac{p / p^0}{\Delta H}$
- $\left[\frac{\partial \ln k_x}{\partial p}\right] = \frac{\Delta H}{\Delta V}$
- $\left[\frac{\partial \ln k_x}{\partial p}\right] = \frac{\Delta n + p}{p^0}$
- $\left[\frac{\partial \ln k_x}{\partial p}\right] = \frac{\Delta n}{p / p^0}$

35 of 100

178 PU_2015_107

Saponification of 1 mole of triglyceride produces:-

- 3 Moles of glycerin + 2 Moles of Fatty acids
- 1 Mole of glycerin + 3 Moles of Fatty acids
- 3 Moles of glycerin + 1 Mole of Fatty acids
- 3 Moles of glycerin + 3 Moles of Fatty acids

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204 PU_2015_107

Select the correct statement.

- Osmosis results from decrease in entropy
- Osmotic pressure depends on temperature and concentration but is independent of the nature of the membrane
- The semi permeable membrane is the cause of osmotic pressure
- The passage of solvent molecules occur only in one direction through a semi permeable membrane

37 of 100

202 PU_2015_107

A container of volume of 1 m^3 is divided in to two equal parts by a partition. One part has an ideal diatomic gas at 300 K and the other part has vacuum. The whole system is isolated from the surroundings. When the partition is removed, the gas expands to occupy the whole volume. Its temperature will be:-

- 227.5 K
- 300 K
- 425 K
- 455 K

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143 PU_2015_107

The second step in the mechanism of imine formation is acid-catalyzed, yet the rate drops below pH 4.5. Why does the rate drop below this pH?

- The carbinolamine intermediate is stable at low pH
- The imine product is hydrolyzed at low pH
- Protonation of the amine decreases its nucleophilicity
- The carbonyl oxygen becomes protonated, decreasing its reactivity

39 of 100

141 PU_2015_107

A *hydrophobic* portion of a protein usually:-

- is oriented away from water molecules

- contains multiple -OH groups
- is formed by hydrogen-bonded interactions
- is highly polar

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168 PU_2015_107

Which one of the following sulfur reagent can exist as chiral compound?

- $PhSO_2OH$
- $PhSOCH_3$
- $PhSCH_3$
- $PhSO_2CH_3$

41 of 100

187 PU_2015_107

An element crystallizes both in fcc and bcc lattices. The density of the element in the two forms is the same, then the ratio of lattice constants of fcc to bcc structure is:-

- 4 : 1
- 2 : 3
- 2 : 1
- 1 : 2

42 of 100

131 PU_2015_107

The reaction $H_2S + H_2O_2 \rightarrow S + H_2O$ illustrates _____ nature of H_2O_2.

- reducing
- acidic
- oxidizing
- alkaline

43 of 100

101 PU_2015_107

The nature of $HCo(CO)_4$ is:-

- acidic
- inert
- basic
- metallic

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186 PU_2015_107

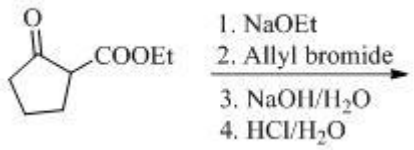
A bottle filled of dry ammonia and other bottle of dry hydrogen chloride connected through a long tube are opened simultaneously at both ends. Then, the white ammonium chloride ring first formed will be:-

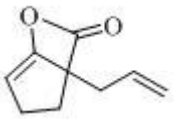
- at the centre of the tube
- near the ammonia bottle
- no fumes will form throughout the length of the tube
- near the hydrogen chloride bottle

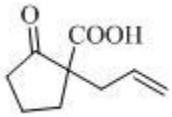
45 of 100

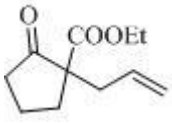
171 PU_2015_107

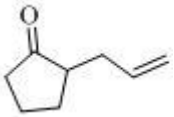
Identify the product formed in the following reaction.



- 

- 

- 

- 

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158 PU_2015_107

Which one of the following statement is wrong about constitutional isomers?

- They have the same molecular formula
- They have the same order of attachment of atoms
- They have the same molecular weight
- They exhibit different physical properties

47 of 100

177 PU_2015_107

Which one of the following amino acid does not have stereogenic carbon?

- Valine
- Proline
- Alanine
- Glycine

48 of 100
213 PU_2015_107
The Huckel 4n+2 electron rule is applicable to:-

- all molecules
- all hydrocarbons
- polycyclic hydrocarbons
- cyclic annulenes

49 of 100
121 PU_2015_107
Which one of the following hemoglobin shows "Domed" shape heme group?

- Deoxyhemoglobin
- Oxyhemoglobin
- Both of these
- None of these

50 of 100
164 PU_2015_107
The generation of amides from oximes by treatment with sulfuric acid is known as:-

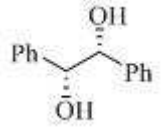
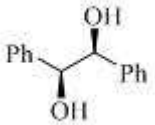
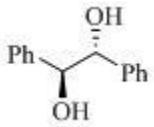
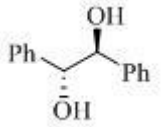
- Curtiusrearrangement
- Schmidt rearrangement
- Hoffman rearrangement
- Beckmann rearrangement

51 of 100
197 PU_2015_107
The addition of alcohol to a saturated aqueous solution of calcium acetate first forms a sol, and then sets to a gelatinuous mass called solid alcohol which is a:-

- solid form
- solid sol
- gel
- aerosol

52 of 100
169 PU_2015_107

Identify the appropriate structure, which corresponds to the name (1*R*, 2*R*)-1,2-diphenylethane-1,2-diol.

- 
- 
- 
- 

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161 PU_2015_107

How many ^{13}C NMR signals would be observed for 1,4-dimethylbenzene?

- 4
- 2
- 3
- 5

54 of 100

135 PU_2015_107

When Zn reacts with nitric acid as in: $4Zn + 10HNO_3 \rightarrow 4Zn(NO_3)_2 + NH_4NO_3 + 3H_2O$, the nitric acid involved in the reaction is:-

- Dilute HNO_3
- Very dilute HNO_3
- Conc. HNO_3
- 50% HNO_3

55 of 100

172 PU_2015_107

The CH_2 protons in compound (S)-1,2-diphenylethan-1-ol gives _____ pattern in ^1H-NMR signals.

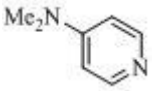
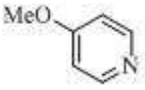
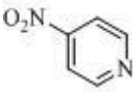
- Triplets at 3.15 ppm and 2.90 ppm
- Doublet of doublets at 3.15 ppm and 2.90 ppm
- Doublets at 3.15 ppm and 2.90 ppm

- Doublet at 3.15 ppm and triplet at 2.90 ppm

56 of 100

167 PU_2015_107

Identify the weak base from the list of following molecules.

- 
- 
- 
- 

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174 PU_2015_107

Reaction of alkyllithium with carbon dioxide gives:-

- Aldehyde
- Ketone
- Ester
- Carboxylic acid

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195 PU_2015_107

The volume of a hexagonal ice lattice is given by:-

- $V = \frac{\sqrt{3}}{2} abc$
- $V = a^2 c$
- $V = \frac{\sqrt{3}}{2} a^2 c$
- $V = a^2$

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192 PU_2015_107

According to Graham's law, at a given temperature, the ratio of the rate of diffusion of gases A and B (r_A / r_B) is given by:-

- $(p_B / p_A)^{1/2} (M_A / M_B)$
- $(p_A / p_B)(M_B / M_A)^{1/2}$
- $(p_A / p_B)^{1/2} (M_A / M_B)$
- $(p_A / p_B)(M_A / M_B)^{1/2}$

60 of 100

180 PU_2015_107

What weight of solute (molecular weight = 60 g/mole) is required to dissolve in 180 g of water to reduce the vapour pressure to 80% of pure water?

- 96 g
- 175 g
- 150 g
- 48 g

61 of 100

222 PU_2015_107

The ground state energy level of Co^{2+} in *Td* environment is:-

- ^4F
- $^4A_2$
- $^1T_2$
- $^4T_1$

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249 PU_2015_107

Nickel can be purified using the following process:-

- Wolfkisher process
- Heber proc
- Mulliken's method
- Mond's process

63 of 100

224 PU_2015_107

Cis-platin can be synthesized as an exclusive product from:-

- $[Pt(NH_3)_4]^{2+}$
- $PtCl_4^{2-}$
- *cis*-$PtCl_2(NH_3)_2$
- *trans*-$PtCl_2(NH_3)_2$

64 of 100

242 PU_2015_107

The reducing power of alkali metals in the gaseous state is in the order.

- Li > Na > K < Rb < Cs
- Li < Na < K < Rb < Cs
- Li > Na > K > Rb > Cs
- Li > Na < K > Rb > Cs

65 of 100

259 PU_2015_107

Successive determination of chloride, bromide and iodide can be made using the following method:-

- iodometry
- gravimetry
- amperometry
- volumetry

66 of 100

258 PU_2015_107

In paper chromatography, the free energy of transfer of A from one phase to another phase B is:-

- $\ln \alpha_A = \Delta\mu_A/RT$
- $\ln \alpha_A = \Delta\mu_A/nRT$
- $\ln \alpha_A = \Delta\mu_A/T$
- $\ln \alpha_A = \Delta\mu_A/R$

67 of 100

247 PU_2015_107

Pick out the odd compound out.

- $Fe(CO)_6$
- $Fe(CO)_5$
- $Fe_3(CO)_{12}$
- $Fe_2(CO)_9$

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228 PU_2015_107

Trans effect is more for:-

- Cl^-
- NH_3
- H_2O
- Br^-

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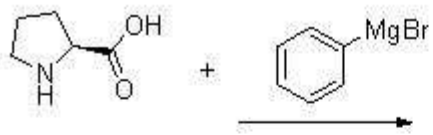
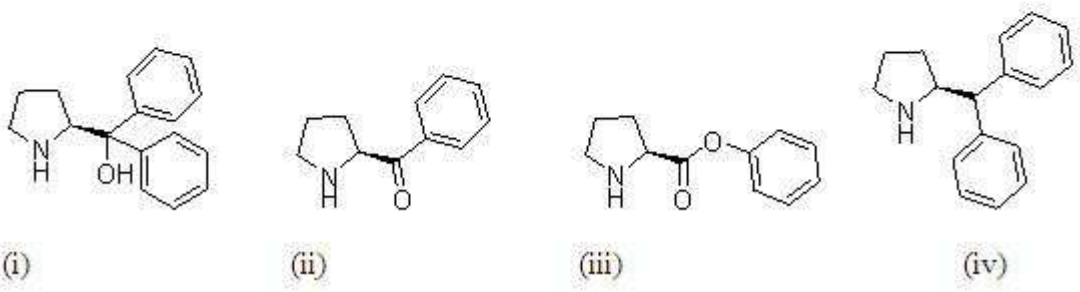
232 PU_2015_107

The product of the following reaction is:-





(i) (ii) (iii) (iv)

- (iii)
- (iv)
- (i)
- (ii)

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257 PU_2015_107

The width of epr signal depends upon _____ of the system under study.

- solvent
- relaxation time
- Zeeman effect
- DPPH

71 of 100

223 PU_2015_107

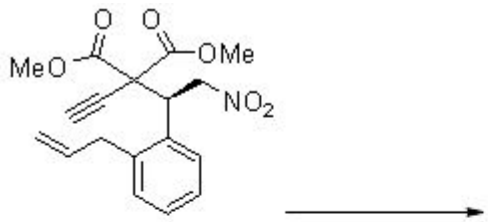
The calculated magnetic moment of Cr^{2+} ion in a weak field is:-

- 4.12 BM
- 4.90 BM
- 7.18 BM
- 2.80 BM

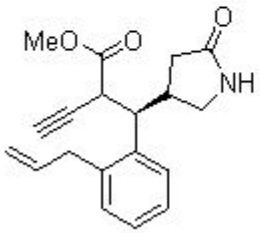
72 of 100

239 PU_2015_107

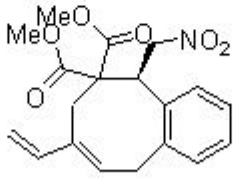
Substrate S can be converted into scaffolds P, Q and R by treating with different reagents. The reagents for the corresponding transformations are:-



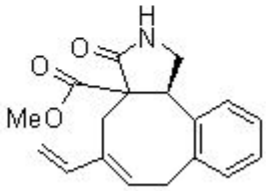
S



P



Q



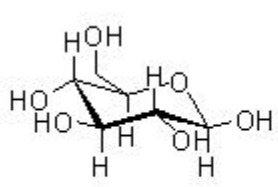
R

☐	D	P	Pyrrolidone ,	Q	$AlCl_3$	R	Zn / HOAc
☐	B	P	Zn / HOAc/ THF,	Q	Grubbs	R	grubbs& Zn / HOAc
☐	C	P	Zn / HOAc/ THF,	Q	$AlCl_3$	R	grubbs& Zn / HOAc
☐	A	P	Pyrrolidone,	Q	Grubbs	R	$AlCl_3$& Zn / HOAc

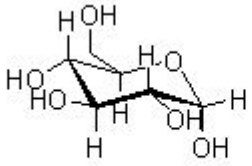
73 of 100

237 PU_2015_107

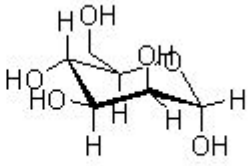
Mannose is C-2 epimer of glucose. Identify which of the following structures represents β -D-manopyranose?



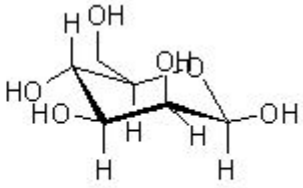
(i)



(ii)



(iii)



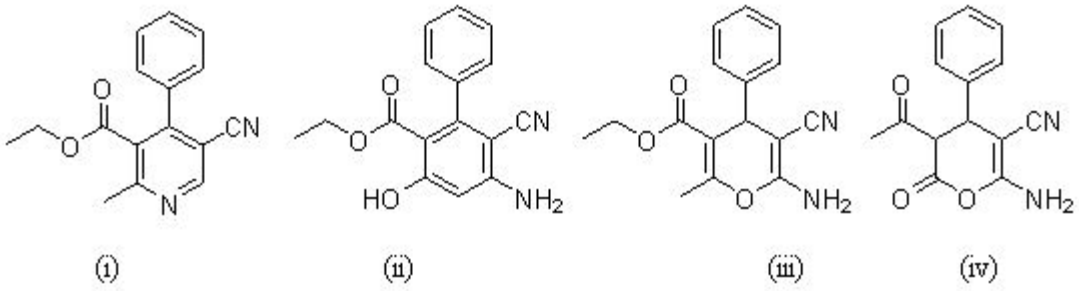
(iv)

- ☐ (iv)
- ☐ (i)
- ☐ (ii)
- ☐ (iii)

74 of 100

233 PU_2015_107

A three-component reaction between ethyl acetoacetate, benzaldehyde and malononitrile gave the product P for which the following alternate structures were proposed. The ^{13}C chemical shifts of the compound in addition to four chemical shift values corresponding to phenyl ring showed signals at 14.2, 17.2, 38.8, 58.1, 61.7, 119.1, 156.6, 159.2 & 165 .4 ppm. Identify the structure of the molecule from the data.



- (iv)
- (iii)
- (i)
- (ii)

75 of 100

246 PU_2015_107
In a close packed arrangement with radius ratio values fall in the range 0.225-0.414;

(i) maximum number of coordination number of cation is 5,
(ii) arrangement of anion round the cation is tetrahedral and
(iii) an example is CsCl.

Pick out the correct statement from the following.

- (i) and (iii) are false, (ii) is true
- (i) and (iii) are true, (ii) is false
- (i) and (ii) are true, (iii) is false
- (i) is true, (ii) and (iii) are false

76 of 100

248 PU_2015_107
Consider a positron emission reaction.

$^{58}Ni_{28} + {}^{1}H_{1} \rightarrow ? + {}^{1}n_{0}$, identify the element that emits positron.

- $^{58}Cu_{28}$
- $^{58}Ni_{28}$
- $^{58}Cu_{29}$
- $^{58}Ni_{29}$

77 of 100

253 PU_2015_107

The second step ionization in sulfuric acid is of the order of $K_a = 10^{-2}$ at 25°C, therefore, this behaves as:-

- weak base
- weak acid
- strong acid
- lewis acid

78 of 100

238 PU_2015_107

Match each item in list A with appropriate item in B.

	A		B
(a)	Glycine	(i)	Smallest enzyme
(b)	Proline	(ii)	Achiral
(c)	Cysteine	(iii)	Basic amino acid
(d)	Histidine	(iv)	R-Configuration

- (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)
- (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)
- (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)
- (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)

79 of 100

225 PU_2015_107

The substitution reaction in $[Co(NH_3)_5Cl]^{2+}$ is faster in the presence of:-

- pressure
- Metal catalyst
- photo light
- OH^-

80 of 100

252 PU_2015_107

According to Maxwell distribution of molecular speeds, the probability of speed of molecule along x direction assuming the range C_x to C_x+dC_x is given by:-

- $Wx = f(C_x) + Cdc_x$
- $Wx = f(C_x) - xdc_x$
- $Wx = f(C_x) - dc_x$
- $Wx = f(C_x) + dc_x$

81 of 100

289 PU_2015_107

If a group has subgroups of order 2, 3, 6, its minimum possible order is:-

- 6
- 11
- 12
- 36

82 of 100

290 PU_2015_107

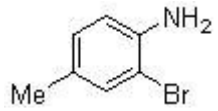
The heat of combustion at constant volume in $C_{10}H_8(s) + 12O_2(g) \rightarrow 10CO_2(g) + 4H_2O(l)$ is -5.133 kJ mol^{-1} at 298 K, the value of enthalpy change is:-

- -5.13×10^2 J
- -5.13×10^3 J
- -5.13×10^6 J
- -5.13×10^4 J

83 of 100

275 PU_2015_107

Preparation of the following molecule from toluene involves several steps like bromination, nitration, reduction, etc. The correct order of performing the reactions is:-



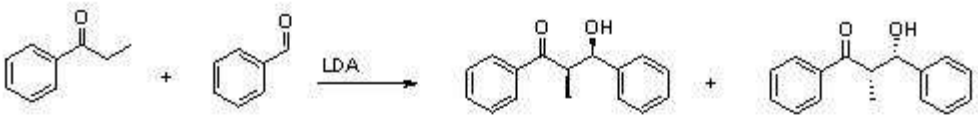
- Nitration, reduction, acylation , bromination&deacylation
- Nitation, bromination& reduction
- Bromination, nitration & reduction
- Acylation, bromination, nitration, reduction &deacylation

84 of 100

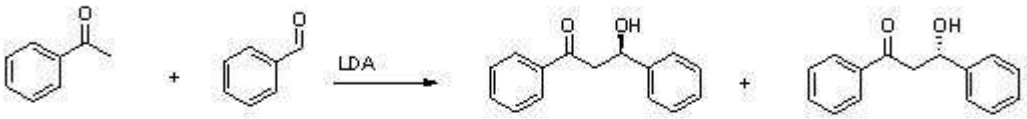
272 PU_2015_107

Which among the following reactions can yield one enantiomer as a major product?

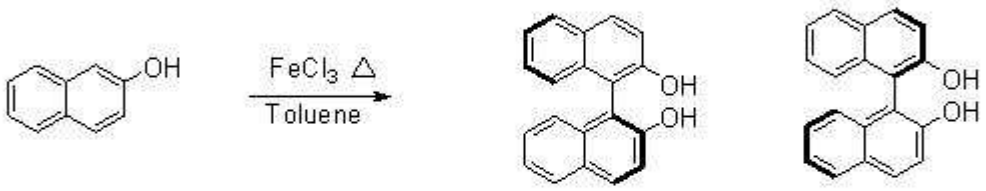
(i)



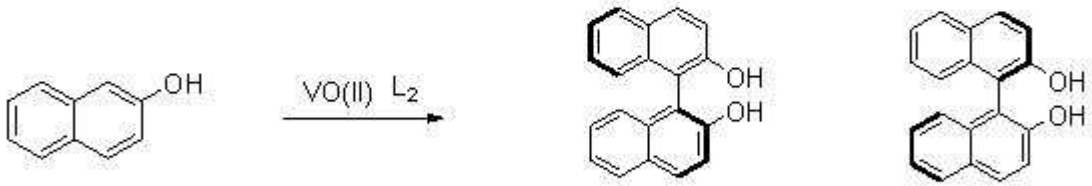
(ii)



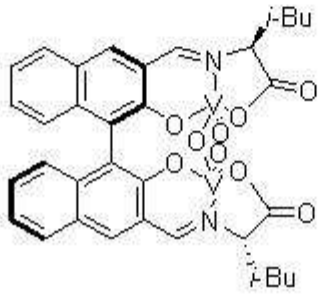
(iii)



(iv)



L_2



- (i)
- (iv)
- (iii) & (iv)
- (i) & (ii)

85 of 100

287 PU_2015_107

It is impossible to solve the a differential equation using power series around a point x, if:-

- x is essentially singular
- x is a regular point
- x is a singular point
- None of the above

86 of 100

262 PU_2015_107

If ClF_3 has to be stereochemically rigid, its ^{19}F NMR spectrum (I = ½ for ^{19}F) would be:- (assume that Cl is not NMR active)

- two singlets
- a doublet and a singlet
- a doublet and a triplet
- a singlet

87 of 100

291 PU_2015_107

Consider a cell Zn/Zn^{2+}, (0.1M) / Ag^{+}, (0.1M)/Ag, calculate EMF of the cell at 25°C if E^{0}cell is 1.56 V.

- 2.6485 V
- 1.6485 V
- 0.6485 V
- 5.6485 V

88 of 100

299 PU_2015_107

Sucrose on complete combustion gives out heat 5.65 x 10^3 kJ, calculate the heat given out for 1 kg of sucrose upon complete combustion.

- 1.65 x 10^4 kJ
- 1.65 x 10^3 kJ
- 3.42 x 10^3 kJ
- 5.65 x 10^3 kJ

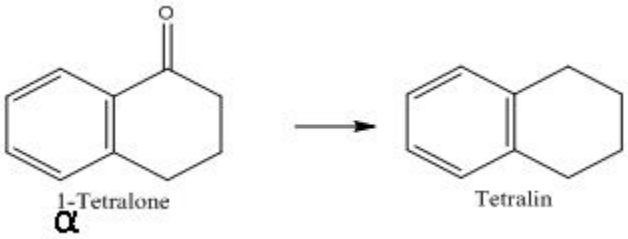
89 of 100

285 PU_2015_107

Orthogonal matrices are necessarily:-

- hermitian
- periodic
- unitary
- scalar

90 of 100
270 PU_2015_107



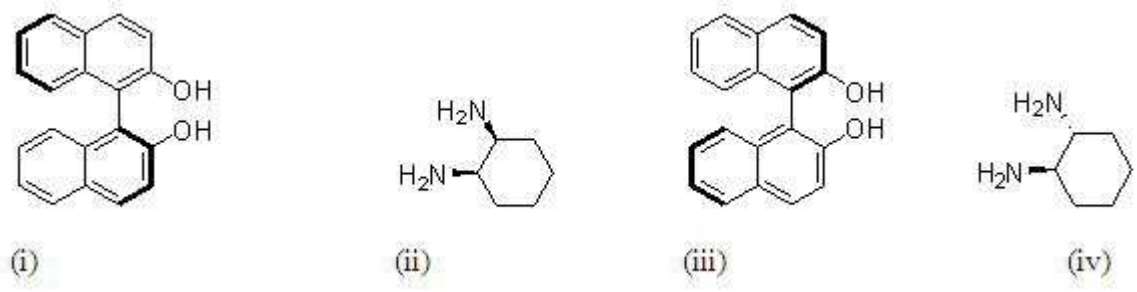
Predict the catalysts for the above reaction.

- Zn and HCl
- Zn(Hg) and HCl
- Zn(Hg) and HBr
- Zn(Hg) and HI

91 of 100
282 PU_2015_107
The equation $x^2 + y^2 = k^2$ represents:-

- parabola
- circle
- a rectangle
- ellipse

92 of 100
271 PU_2015_107
Which of the following can be used as ligands in asymmetric synthesis?



- (i), (iii) and (iv)
- (i) and (iii)
- (i), (ii) and (iii)
- (ii) and (iv)

93 of 100
286 PU_2015_107

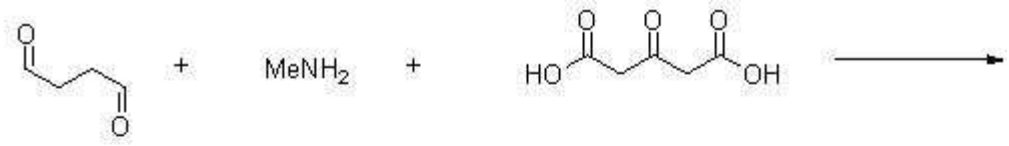
The operator for kinetic energy is:-

- Vector operator
- Differential operator
- Vector operator and differential operator
- Neither vector operator nor differential operator

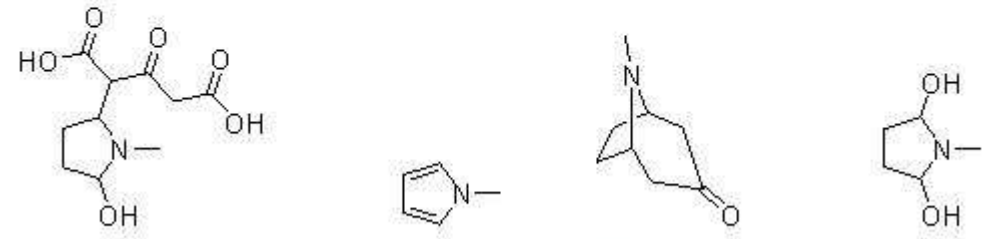
94 of 100

277 PU_2015_107

The product of the following reaction is:-



A



(i) (ii) (iii) (iv)

- (i)
- (i) & (iv)
- (ii) & (iv)
- (iii)

95 of 100

269 PU_2015_107

In the following reactions:-

(i) $Mn_2(CO)_{10} + Na \rightarrow X$ and (ii) $X + CH_3COCl \rightarrow Y$. The X and Y respectively are:-

- $[Mn(CO)_4]^{2-}$, $[CH_3C(O)Mn(CO)_5]^-$
- $[Mn(CO)_5]^-$, $CH_3C(O)Mn(CO)_5$
- $[Mn(CO)_4]^{2-}$, $[ClMn(CO)_5]^-$
- $[Mn(CO)_5]^-$, $ClMn(CO)_5$

96 of 100

297 PU_2015_107

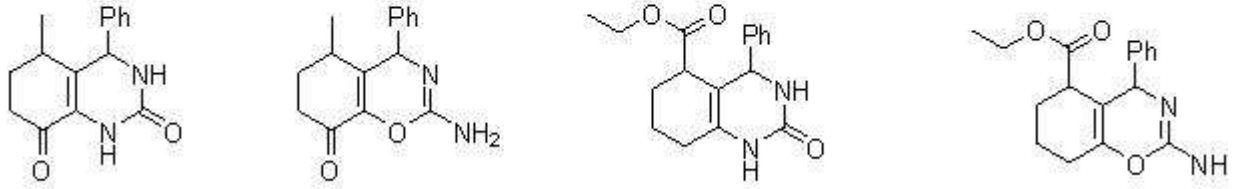
Freundich adsorption isotherm gives a straight line by plotting the following:-

- x/m *vs* 1/P
- x/m *vs* P
- logx/m *vs* P
- logx/m *vs* lopP

97 of 100

276 PU_2015_107

The product of the following reaction is:-



(i) (ii) (iii) (iv)

- (ii) & (iv)
- (i) &(iii)
- (iii)
- (i)

98 of 100

298 PU_2015_107

In a hydrogenation reaction at 27° C, the pressure of hydrogen gas decreases from 2 atm to 1.1 atm in 75 min, calculate the rate of the reaction (R = 0.0821 lit atm mol^{-1} K^{-1}).

- 8.12 x 10^{6} mol L^{-1} s^{-1}
- 8.12 x 10^{-2} mol L^{-1} s^{-1}
- 8.12 x 10^{2} mol L^{-1} s^{-1}
- 8.12 x 10^{-6} mol L^{-1} s^{-1}

99 of 100

288 PU_2015_107

If a pair of dice is thrown, what is the probability that a sum of 7 shows up?

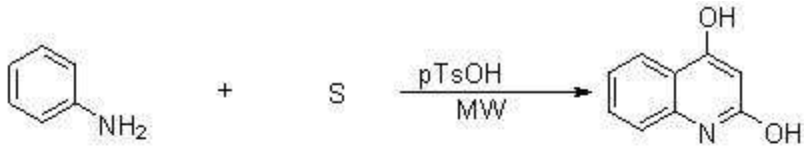
- 1/36
- 5/12

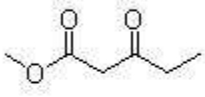
- 7/36
- 1/6

100 of 100

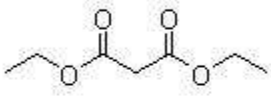
278 PU_2015_107

Identify the substrate S which on treatment with aniline will give the product shown in the following reaction.

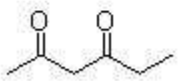




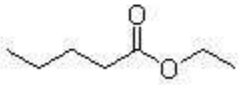
(i)



(ii)



(iii)



(iv)

- (ii)
- (iii)
- (iv)
- (i)