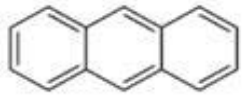
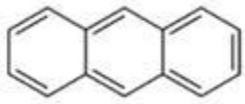
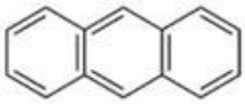
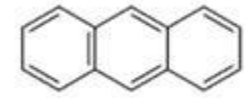
107 PU Ph D Chemistry

1 of 100
193 PU_2016_107_E
Which of the following statements is true for an *ideal-dilute* solution?

- The solute and solvent both obey Raoult's law.
- The solute obeys Henry's law and the solvent obeys Raoult's law.
- The solute and solvent both obey Henry's law.
- The solute obeys Raoult's law and the solvent obeys Henry's law.

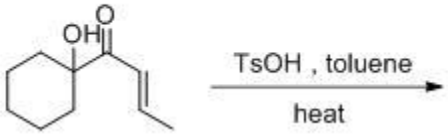
2 of 100
144 PU_2016_107_E
Which is impossible as a resonance contributor of anthracene:-

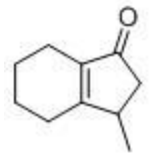
- 
- 
- 
- 

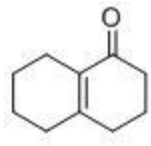
3 of 100
163 PU_2016_107_E
Among the following, the synthetic equivalent for acyl anion is:-

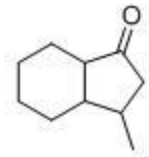
- Nitro ethane and a base
- α-Chloro acrylonitrile
- Acetyl Chloride and trimethyl amine
- Ethyl magnesium bromide

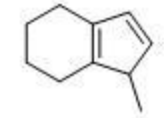
4 of 100
164 PU_2016_107_E
The major product obtained in the following transformation is







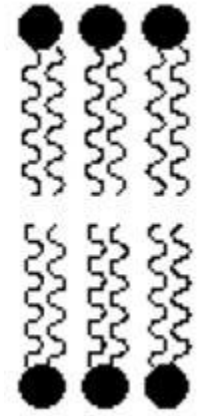


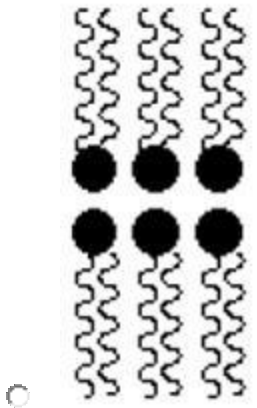


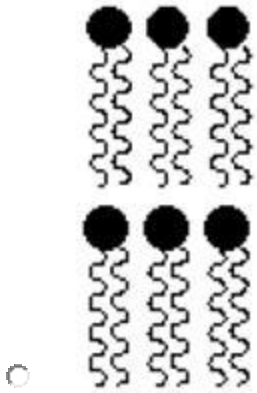
5 of 100

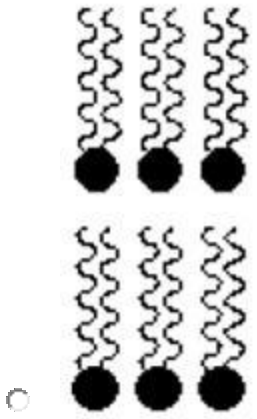
147 PU_2016_107_E

Which of the following is the correct representation for the structure of a lipid bilayer under physiological conditions?









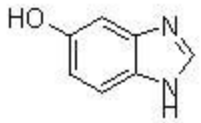
6 of 100

158 PU_2016_107_E

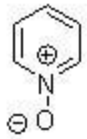
(i) Presence of an imine nitrogen deactivates the heterocyclic system for an electophilic substitution reaction. But, performing electophilic substitution reaction is possible by incorporating an electron releasing group on such systems.

(ii) Formylation using DMF/ $POCl_3$ is possible only on very reactive aromatics.

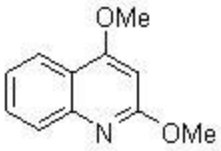
Based on the information given in (i) & (ii) which of the following substrates can be readily formylated using DMF / $POCl_3$?



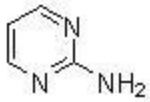
(i)



(ii)



(iii)



(iv)

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

7 of 100

212 PU_2016_107_E

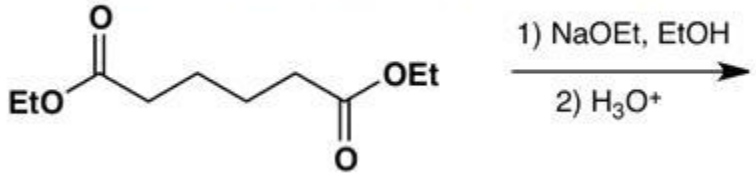
The standard reduction potentials of Mg/Mg^{2+} is -2.360 , and Cu/Cu^{2+} is 0.337 V. The standard cell emf for the raction Mg + Cu2+ → Mg^{2+} + Cu, wil be given by:-

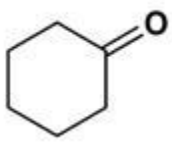
- - 2.023 V
- 2.697 V
- 2.02 V
- -2.697 V

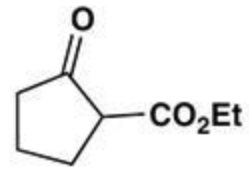
8 of 100

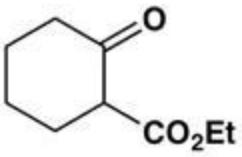
153 PU_2016_107_E

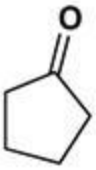
Which is the main product of the following reaction?



- 







9 of 100

136 PU_2016_107_E

RCH_2CH_2 can be converted to corresponding aldehyde in the presence of CO and H_2 using one of the following catalysts:-

- $RhL_2(PR_3)(Cl)$
- $Cu(OAc)_2$
- $Pd(OAc)_2$
- $Co_2(CO)_8$

10 of 100

126 PU_2016_107_E

Fe(CO) reacts with BH_4^- to yield:-

- aldehyde
- H- substituted product
- 1,2 one
- none of these

11 of 100

128 PU_2016_107_E

$M\text{-}CH_2CH_2R$ cannot be isolated due to:-

- carbene generation
- β-hydride elimination
- σ-bond metathesis
- α-hydride elimination

12 of 100

122 PU_2016_107_E

Tilley mechanism explains:-

- hydrogenation reaction
- hydroformylation
- olefin polymerization
- hydrosilylation

13 of 100

143 PU_2016_107_E

How many signals does the unsaturated ketone $(CH_3)_2CHCH_2C(O)CH=CH_2$ have in ^{1}H NMR and ^{13}C NMR spectra?

- five ^{1}H signals and seven ^{13}C signals
- five ^{1}H signals and six ^{13}C signals
- six ^{1}H signals and six ^{13}C signals
- six ^{1}H signals and seven ^{13}C signals

14 of 100

180 PU_2016_107_E

A nuclear magnetic resonance transition is shifted from the reference in a 400 MHz NMR spectrometer by 529 Hz. Calculate the chemical shift:-

- 1.76
- 1.32
- 5.29
- 7.56

15 of 100

100 PU_2016_107_E

The neutral complex which follows the eighteen electron rule is:-

- $(\eta^5\text{-}C_5H_5)Mo(CO)_3$
- $(\eta 5\text{-}C_5H_5)_2Co$
- $(\eta^5\text{-}C_5H_5)Re((\eta^6\text{-}C_6H_6)$
- $(\eta^5\text{-}C_5H_5)Fe(CO)_2$

16 of 100

206 PU_2016_107_E

The mean square average distance, $<X^2>$ of a diffusing species after time t is given by:-

- $<x^2> = 2Dt$
- $<x^2> = 2Dt^2$
- $<x^2> = Dt$

- $\langle x^2 \rangle = 3Dt$

17 of 100

150 PU_2016_107_E

40% of the bases in a certain DNA molecule are found to be C. What percent of thebases in this same molecule are A?

- 20%
- 80%
- 10%
- 40%

18 of 100

129 PU_2016_107_E

Fischer carbene prefers low oxidation metal ions and Schrock carbene prefers high oxidation state metal ions:-

- Correct
- Not correct
- Fischer carbene prefers para magnetic ions
- both prefer unpaired electrons

19 of 100

157 PU_2016_107_E

Which of the following statement(s) is / are true with respect to privileged scaffolds?

i The core structure of a molecule that is common to a series of compounds
ii The scaffold should not be capable of forming any binding interactions with the target.
iii A scaffold that is present in a wide range of drugs with different activities
iv Similar functional groups on the scaffold should be capable of being varied independently of each other

- ii & iv alone
- i,ii & iii
- i,iii & iv
- i & iii alone

20 of 100

123 PU_2016_107_E

The metal ion that is expected to shift the C_1 methylene group in heptanol, from δ 2 to 10 ppm in ^1H NMR is:-

- Al(III)
- Sc(III)
- Eu(III)
- Tl(III)

21 of 100

110 PU_2016_107_E
The pair of ions that most commonly forms complexes with coordination number 2 is:-

- Cu(II) and Hg(I)
- Cu(I) and Hg(II)
- Cd(II) and Hg(I)
- Cd(II) and Hg(II)

22 of 100

188 PU_2016_107_E
To which orbitals may an electron in a 2p orbital in a hydrogenic atom make allowed spectroscopic transitions?

- 1s and 3p
- ns and nd
- ns, np and nd
- nd and nf

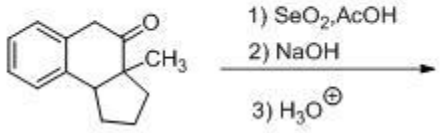
23 of 100

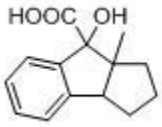
119 PU_2016_107_E
In biological systems, the metal ions involved in electron transport are:-

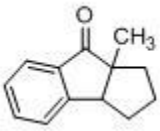
- Na^+ and K^+
- Cu^{2+} and Fe^{3+}
- Ca^{2+} and Mg^{2+}
- Zn^{2+} and Mg^{2+}

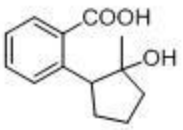
24 of 100

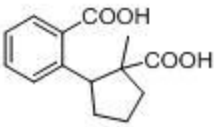
179 PU_2016_107_E
The major product formed in the following reaction is



- 

- 

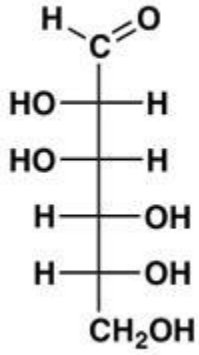




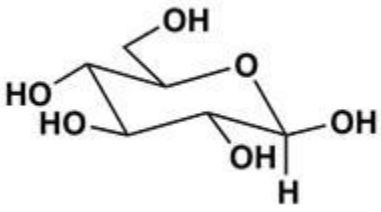
25 of 100

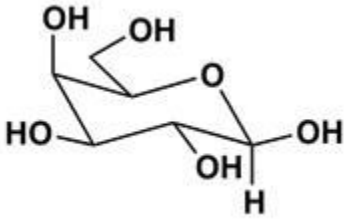
155 PU_2016_107_E

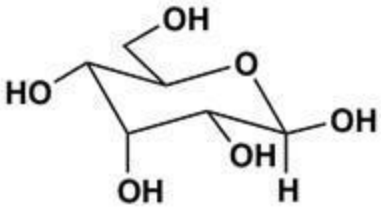
Which is the correct chair form of the β anomer of D-mannose?

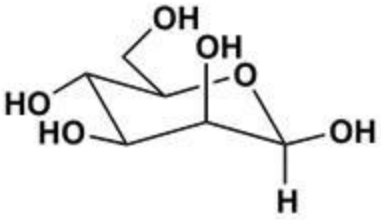


D-mannose









26 of 100

104 PU_2016_107_E

Low oxidation metal centre can be stabilized using:-

- σ acid ligands
- π-acid ligands
- more electron rich ligands
- metal acids

27 of 100

194 PU_2016_107_E

A hypothetical system consists of 5 molecules and 2 quanta. What is the number of possible arrangements?

- 2
- 21
- 3
- 15

28 of 100

182 PU_2016_107_E

The root-mean-square distance between the ends of a polymer chain was found to be 6.2 nm. Estimate the number of monomers in the chain, given that the length of each monomer unit is 2.1 Å.

- 870
- 17
- 6
- 30

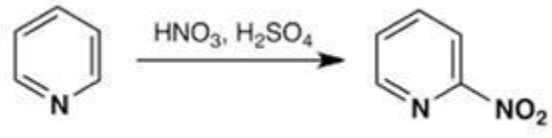
29 of 100

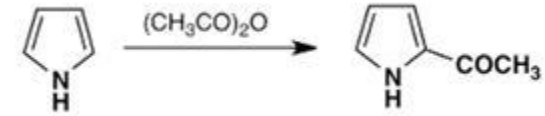
207 PU_2016_107_E
The number of variables in phase space is given:-

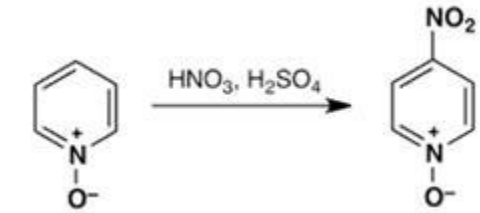
- 5
- 4
- 3
- 6

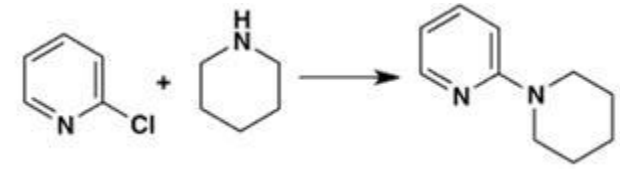
30 of 100

146 PU_2016_107_E
Which of the following equations shows an unlikely result?

- 

- 

- 

- 

31 of 100

189 PU_2016_107_E
On a pressure-temperature phase diagram, the conditions under which a one-component system exists as two phases in equilibrium corresponds to:-

- an area.
- the entire diagram
- a point.
- a line.

32 of 100

190 PU_2016_107_E

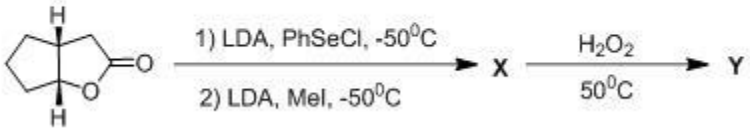
How many nodes are expected for the vibrational wavefunction with quantum number v = 4?

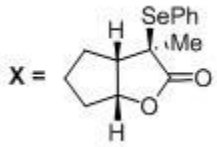
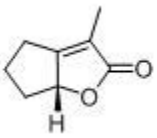
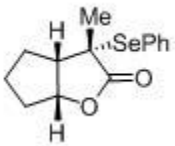
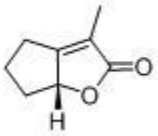
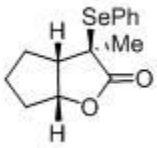
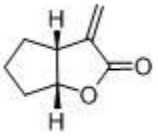
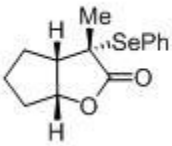
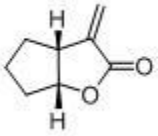
- 3
- 0
- 4
- 1

33 of 100

178 PU_2016_107_E

The major products X and Y formed in the following reaction sequence are



- X =  Y = 
- X =  Y = 
- X =  Y = 
- X =  Y = 

34 of 100

124 PU_2016_107_E

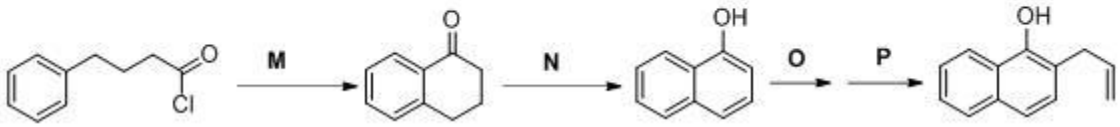
The ground state energy level of Co^{2+} in *Td* environment is:-

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

35 of 100

162 PU_2016_107_E

Choose the correct combination of reagents/reaction conditions from M to P to carry out the following transformation

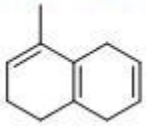


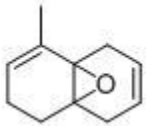
- M = $ZnCl_2$; N = H_2 , Pd/C ; O = Allyl bromide , acetone, K_2CO_3 ; P = Δ
- M = $AlCl_3$, N = DDQ ; O = Vinyl chloride , $NaNH_2$; P = Δ
- M = Δ ; N = H_2 , Pd/C ; O = Vinyl chloride, KOH ; P = $AlCl_3$
- M = $AlCl_3$; N = DDQ ; O = Allyl bromide , acetone , K_2CO_3 ; P = Δ

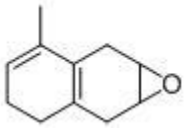
36 of 100

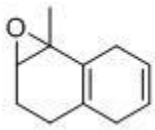
177 PU_2016_107_E

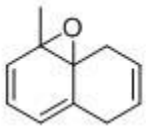
The major product obtained upon epoxidation of the following triene with m-chloroperbenzoic acid is



- 

- 

- 

- 

37 of 100

185 PU_2016_107_E

How many molecular orbitals may be constructed from the valence shell orbitals of the constituent atoms in CH_4?

- 6
- 8
- 4
- 7

38 of 100

138 PU_2016_107_E

When we go from D_3h to C_2v point group the energy of doubly degenerate orbital:-

- remains unaltered
- Degeneracy will be lost
- degeneracy will not be lost
- only a symmetry will be affected

39 of 100

195 PU_2016_107_E

The electrical conductivity of a new material was measured at different temperatures and found to vary as below. What is the best description of the conduction properties of the material?

T / K	300	400	500	600
Conductivity / S m^{-1}	0.004	0.047	0.202	0.535

- Semiconductor
- Conductor
- Insulator
- It is not possible to infer anything about the properties of the material

40 of 100

209 PU_2016_107_E

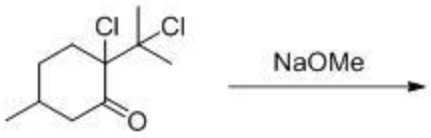
Which of the following plane is not parallel to the z-axis?

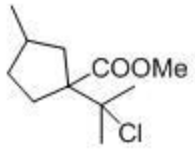
- (001)
- (110)
- (100)
- (010)

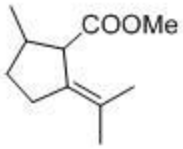
41 of 100

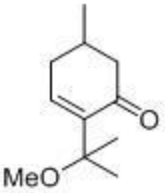
165 PU_2016_107_E

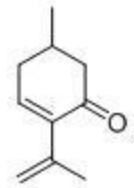
The major product formed in the following reaction is











42 of 100

121 PU_2016_107_E

C_2H_4 can be converted into CH_3CHO in the presence of O_2 is known as:-

- Mansanto process
- Grubbs metathesis process
- Olefin reduction process
- Wacker process

43 of 100

131 PU_2016_107_E

One of the following statement is correct for the CpRe(Me)(PMe_3)(NO):-

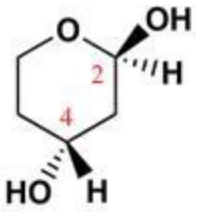
- Me can be substituted by PMe_3

- NO can be substituted by PMe_3
- Cp can be substituted by PMe_3
- PMe_3 can be substituted by NO

44 of 100

141 PU_2016_107_E

Which is the correct assignment of chirality at C2 and C4 of the following molecule?



- 2S,4R
- 2R,4R
- 2R,4S
- 2S,4S

45 of 100

108 PU_2016_107_E

The bonding in Cp in $Fe(Cp)_2(CO)_2$ is such that:-

- both Cp rings are pentahapto
- both Cp rings are monohapto
- one Cp ring is pentahapto and other Cp ring is monohapto
- both Cp rings are ionically bonded

46 of 100

133 PU_2016_107_E

$Ir(PPh_3)_3Cl$ shows one of the following:-

- Agostic interaction
- 100% ionic bond
- non covalent interaction
- 100 % covalent bond

47 of 100

114 PU_2016_107_E

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*-$PtCl_2(NH_3)_2$

48 of 100

211 PU_2016_107_E

In Bragg reflection formula $n\lambda = 2d \sin\theta$, the possible value(s) on the order reflection, n, is given by:-

- 2 only
- 1 only
- 3 only
- all values as above

49 of 100

101 PU_2016_107_E

The zero magnetic moment of octahedral K_2NiF_6 is due to:-

- high spin d^6 Ni(IV) complex
- low spin d^8 Ni(II) complex
- high spin d^8 Ni(II) complex
- low spin d^6 Ni(IV) complex

50 of 100

112 PU_2016_107_E

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

- 7
- 6
- 2
- 3

51 of 100

187 PU_2016_107_E

Use Hückel theory to determine the energies of the π orbitals of the allyl radical system, C_3H_4:-

- $\alpha + \sqrt{2}\beta, \alpha, \alpha - \sqrt{2}\beta$
- $\alpha + \beta, \alpha, \alpha - \beta$
- $\alpha + 2\beta, \alpha, \alpha - 2\beta$
- α, α, α

52 of 100

116 PU_2016_107_E

The structures of $N(CH_3)_3$ and $N(SiH_3)_3$, respectively, are:-

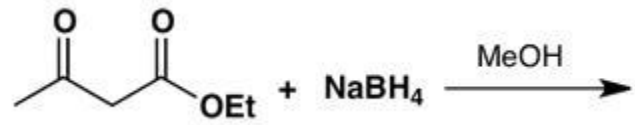
- pyramidal and pyramidal
- trigonal planar and pyramidal
- pyramidal and trigonal planar
- trigonal planar and trigonal planar

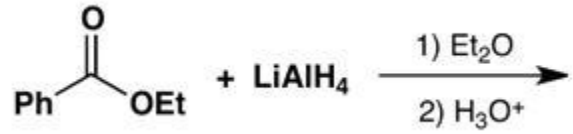
53 of 100

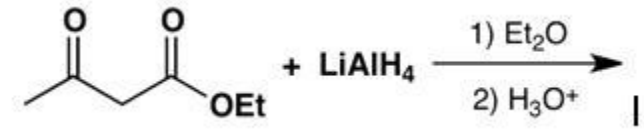
151 PU_2016_107_E

Which of the following reactions does not give a racemic mixture of the product?

- 

- 

- 

- 

54 of 100

134 PU_2016_107_E

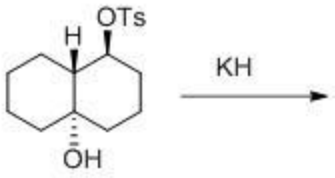
$CpFe(CO)_2(C_2H_4)$ reacts with OMe to yield:-

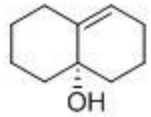
- Aromatic nucleophilic substitution reaction on Cp
- addition on C centre of C_2H_4
- addition on C centre of CO
- addition on Fe centre

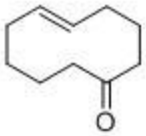
55 of 100

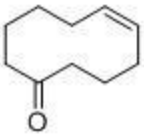
175 PU_2016_107_E

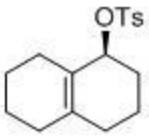
The major product formed in the following reaction is











56 of 100

181 PU_2016_107_E

How many normal modes of vibrational are possible for a benzene molecule?

- 30
- 31
- 6
- 12

57 of 100

139 PU_2016_107_E

ΔH will be related to applied magnetic field is:-

- H_o+B
- B+H_o
- H_o-B
- B-H_o

58 of 100

192 PU_2016_107_E

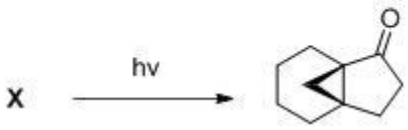
Which of the following statements is always true for a liquid mixture of two components A and B in equilibrium with a mixture of their vapours?

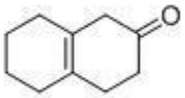
- $\mu_A(l) \neq \mu_A(g) \neq \mu_B(l) \neq \mu_B(g)$
- $\mu_A(l) = \mu_A(g)$ and $\mu_B(l) = \mu_B(g)$
- $\mu_A(l) = \mu_A(g) = \mu_B(l) = \mu_B(g)$
- $\mu_A(l) = \mu_B(l)$ and $\mu_A(g) = \mu_B(g)$

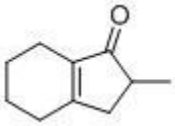
59 of 100

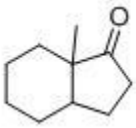
176 PU_2016_107_E

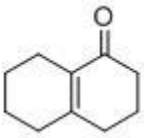
Structure of the starting material X in the following Photochemical Norrish reaction is



- 

- 

- 

- 

60 of 100

169 PU_2016_107_E

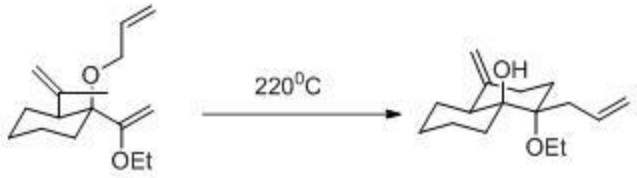
The reagent suitable for converting Oct-4-yne to trans -oct-4-ene is:-

- $NaBH_4$
- Pd / $CaCO_3$ / H_2
- H_2-Pd / C
- Na / Liq.NH_3

61 of 100

236 PU_2016_107_M

The following transformation involves sequential



- Cope rearrangement - Ene reaction - Claisen rearrangement
- Cope rearrangement - Claisen rearrangement - Ene reaction
- Claisen rearrangement Cope rearrangement - Ene reaction
- Ene reaction - Claisen rearrangement - Cope rearrangement

62 of 100

240 PU_2016_107_M

The adsorption of a gas on a solid surface was found to follow a Langmuir isotherm with K = 3.76 kPa^{-1} at a temperature of 25°C. Determine the pressure of gas required to achieve a fractional surface coverage of 10%.

- 30 Pa
- 270 Pa
- 27 Pa
- 38 Pa

63 of 100

229 PU_2016_107_M

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

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

64 of 100

225 PU_2016_107_M

The correct order of the CO stretching vibrational frequency is:-

- $[Ti(CO)_6]^{2-} > [V(CO)_6]^{-} > CO > Cr(CO)_6$
- $CO > [V(CO)_6]^{-} > [Ti(CO)_6]^{2-} > Cr(CO)_6$
- $CO > Cr(CO)_6 > [V(CO)_6]^{-} > [Ti(CO)_6]^{2-}$
- $Cr(CO)_6 > CO > [V(CO)_6]^{-} > [Ti(CO)_6]^{2-}$

65 of 100

243 PU_2016_107_M

A line in the Paschen series of the emission spectrum of atomic hydrogen is observed at a wavenumber of 7800 cm^{-1}. Deduce the upper state principal quantum number for this transition:-

- 5
- 6
- 4
- 7

66 of 100

226 PU_2016_107_M

Photochromism is defined as:-

- light induced irreversible color change
- light induced reversible color change
- thermally activated reversible color change
- light induced sensing of small molecules

67 of 100

244 PU_2016_107_M

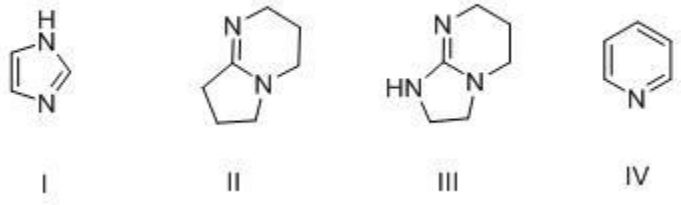
What terms can arise from the configuration $2p^1 3p^1$?

- $^3D, ^3P, ^3S$
- $^1D, ^3P, ^3S$
- $^3D, ^1D, ^3P, ^1P, ^3S, ^1S$
- $^1D, ^1P, ^1S$

68 of 100

238 PU_2016_107_M

The decreasing order of basicity of the following compounds is



- IV> I> II> III
- IV> III> II>I
- I> II> III >IV
- III> II> I> IV

69 of 100

246 PU_2016_107_M

Which of the following statements about the kinetics of the reaction $H_2(g) + Br_2(g) \rightarrow 2HBr\ (g)$ is definitely true?

- The reaction is second order overall
- It is not possible to determine anything about the kinetics of the reaction from the stoichiometry
- The reaction is first order with respect to bromine, Br_2
- The presence of hydrogen bromide, HBr, inhibits the rate of the reaction

70 of 100

247 PU_2016_107_M

For a galvanic cell, which of the following statements is never true?

- The electrons flow in the external circuit from the anode to the cathode.
- Oxidation takes place at the anode
- Reduction takes place at the cathode.
- The potential of the cathode is higher than that of the anode.

71 of 100

228 PU_2016_107_M

The order of MOs for PR_3 complexes of transition metals in *Oh* field is:-

- $t_{2g} > e_g > e_g^*$
- $t_{2g}^* > e_g^* > t_{2g}$
- $t_{2g} > t_{2g}^* > e_g^*$
- $t_{2g} > e_g^* > t_{2g}^*$

72 of 100

252 PU_2016_107_M

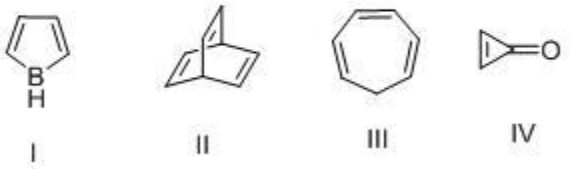
The minimal energy conformation of staggered form of ethane is attributed to:-

- steric attraction between hydrogen atoms
- steric repulsion between hydrogen atoms
- Polarizability
- Hyper-conjugation

73 of 100

237 PU_2016_107_M

The compound that is antiaromatic is



I II III IV

- III
- IV
- II
- I

74 of 100

255 PU_2016_107_M

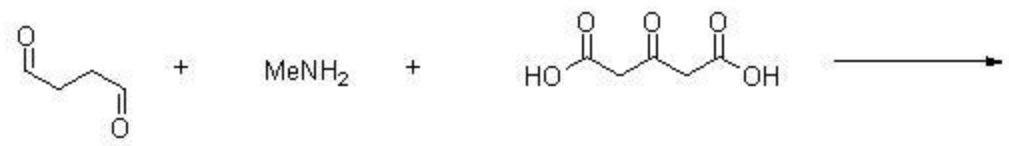
The tight-binding approximation is ideal for:-

- All periodic systems
- metals
- semi-conductors
- insulators

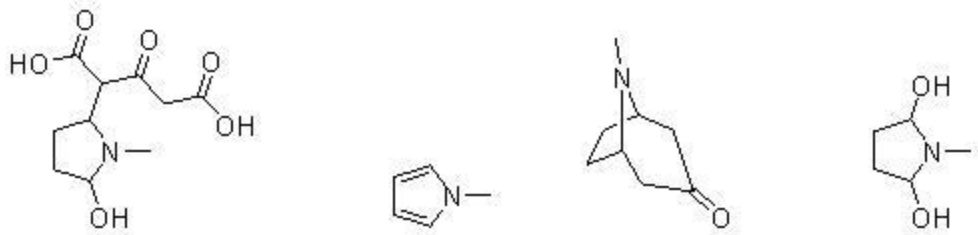
75 of 100

234 PU_2016_107_M

The product of the following reaction is:



A



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

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

76 of 100

242 PU_2016_107_M

The dipole moment of hydrogen fluoride, HCl, is 1.91 D and the bond length is 0.917Å . Calculate the fractional charge on the hydrogen and chlorine atoms:-

- 0.22e
- 1.45e
- 0.43e
- 0.65e

77 of 100

258 PU_2016_107_M

Potential energy surface is a plot of:-

- Total energy of the Schrodinger equation for nuclear motion
- Potential energy associated with nuclear-nuclear repulsion
- Total energy associated with electronic Schrodinger equation
- potential energy associated with the electronic Schrodinger equation

78 of 100

249 PU_2016_107_M

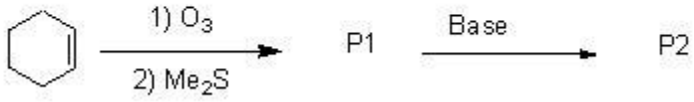
The standard Gibbs energy of reaction, ΔrG°, for the dissociation of phenol is 56.4 kJ mol-1 at 298 K. Calculate the Pk_a of phenol:-

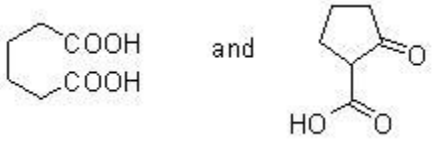
- 9.88
- 5.24
- 22.8
- 4.12

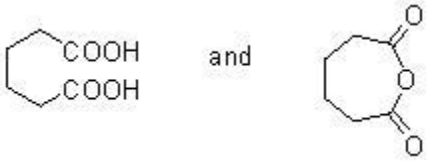
79 of 100

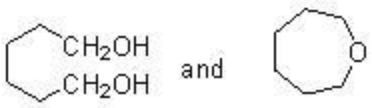
231 PU_2016_107_M

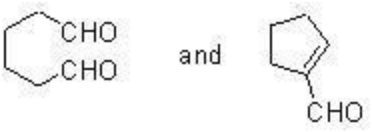
The products of the following reaction P1 and P2 are



- 

- 





80 of 100

251 PU_2016_107_M

Inert pair effect is not related to:-

- Hund's rule of maximum multiplicity
- Relative diffusion of s and p orbitals
- avoided crossing
- sp mixing

81 of 100

279 PU_2016_107_D

The $[\alpha]_D$ of a 90% optically pure 2-arylpropanoic acid solution is +135°.On treatment with a base at RT for one hour, $[a]_D$ changed to +120°. The optical purity is reduced to 40% after 3 hours. If so, the optical purity of the solution after one hour and its $[\alpha]_D$ after 3 hours respectively would be

- 70 % and 60°
- 80 % and 60°
- 80 % and 90°
- 70 % and 40°

82 of 100

280 PU_2016_107_D

The ΔG for a reaction at 300 K is -16 kcal and ΔH is -10 kcal. The entropy of the reaction is:-

- 20 cal deg^{-1}
- 100 cal deg^{-1}
- 86.6 cal deg^{-1}
- 166 cal deg^{-1}

83 of 100

281 PU_2016_107_D

The pH of 10^{-3} M NaOH solution is:-

- 11
- 10
- 12

- 13

84 of 100

290 PU_2016_107_D

In VB theory, the stability of ground state H_2 molecule is primarily attributed to:-

- Overlap
- Exchange interaction
- Kinetic energy of electrons.
- (e) electron-nuclear attraction

85 of 100

293 PU_2016_107_D

Which of the following is not unity in atomic units?

- Planck's energy packet h/2π
- Energy of the 1s electron in Hydrogen atom
- Mass of the electron
- Charge of the electron

86 of 100

285 PU_2016_107_D

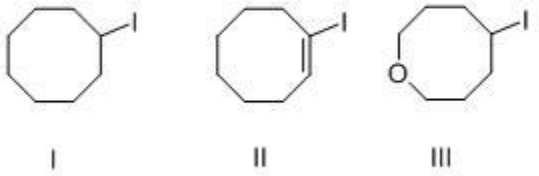
Sets having same elements are called:-

- equivalent set
- (c) equal set
- overlapping set
- subset

87 of 100

275 PU_2016_107_D

The relative rates of solvolysis of iodides A- C are



- III> I> II
- III> II> I
- II> I> III
- II> III> I

88 of 100
295 PU_2016_107_D
A linear variational trial function should necessarily:-

- Be the linear combination of Eigen functions of the Hamiltonian operator.
- Satisfy the boundary conditions of the system.
- Normalized.
- Linear combination of orthogonal functions.

89 of 100
297 PU_2016_107_D
The Highest occupied molecular orbital in water molecule is:-

- O-H Bonding
- O-H antibonding
- One of the nonbonding non-degenerate oxygen lone-pair
- Non-bonding Doubly degenerate oxygen lone-pairs

90 of 100
282 PU_2016_107_D
For the reaction

$A + B \rightarrow C + D$,
ΔH = -25 kcal and ΔS = 90 cal deg^{-1} at 27° C.
The reaction:-

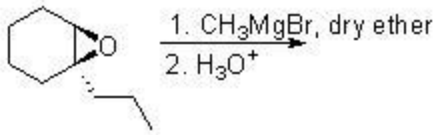
- is not feasible at 27° C
- is reversible at 27° C
- can occur only at temperature higher than 27° C.
- represents equilibrium state at 27° C

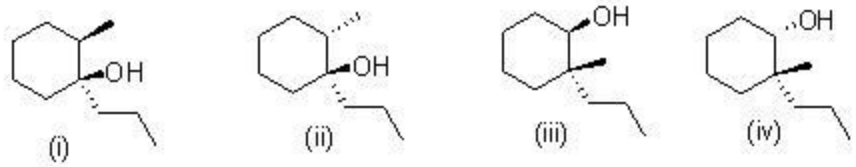
91 of 100
284 PU_2016_107_D
The latent heat of vaporization of water at 100 °C is 540 cal g-1. What will be the change in entropy when one mole of water at 100° C is evaporated:-

- 260 cal K^{-1} mol^{-1}
- 26 cal K^{-1} mol^{-1}
- 360 cal K^{-1} mol^{-1}
- 160 cal K^{-1} mol^{-1}

92 of 100
271 PU_2016_107_D

Which of the following is the major product of the reaction shown below:





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

93 of 100

269 PU_2016_107_D

The low reactivity of N2 molecule is attributed to:-

- High electronegativity of nitrogen atoms
- The smaller size of the nitrogen atom
- High bond order
- sp-mixing

94 of 100

264 PU_2016_107_D

The ground term for d1 Oh and d9 Td is:-

- $^0T_{1u}$
- $^2T_{1u}$
- $^2T_{2g}$
- $^1A_{1g}$

95 of 100

286 PU_2016_107_D

If a function is defined as f(x)= (x^2-1) / 3 ; then at which of the following point is the function singular?

- -1
- 1
- 3
- none of the above

96 of 100

299 PU_2016_107_D

An acceptable wave function for a quantum mechanical system need not be:-

- Finite
- Continuous
- Real
- Single valued

97 of 100

262 PU_2016_107_D

For Cr(III) ion which one of the following transition is lower in energy:-

- $^4A_{2g}$ to $^4T_{2g}$
- $^4A_{2g}$ to $^4A_{1g}$(P)
- $^4A_{1g}$ to $^4A_{1u}$
- $^4A_{2g}$ to $^4A_{1g}$(F)

98 of 100

266 PU_2016_107_D

K2PtCl6 shows one of the following:-

- UV-Vis band at 450nm
- EPR fine structure
- IR band at 2435 cm^{-1}
- NMR signal at 8 ppm

99 of 100

287 PU_2016_107_D

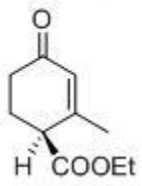
Which of the following is a monotonically increasing function?

- $y = ae^{bx}$, where a and b are positive constants,
- $y = (x^2-a^2)^{1/2}$, where a is a positive constant
- $y = ae^{-bx}$, where a and b are positive constants,
- y = -mx, where m is positive constant,

100 of 100

277 PU_2016_107_D

The IUPAC name of the compound given below is



- Ethyl (S) 2-methyl 4-oxocyclohex -2- enecarboxylate
- (S) 4-ethoxycarbonyl -3-methylcyclohex-2-enone
- (R) 4-ethoxycarbonyl -3-methylcyclohex-2-enone
- Ethyl (R) 2-methyl 4-oxocyclohex -2- enecarboxylate