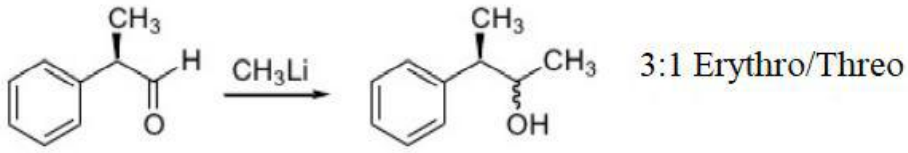
A

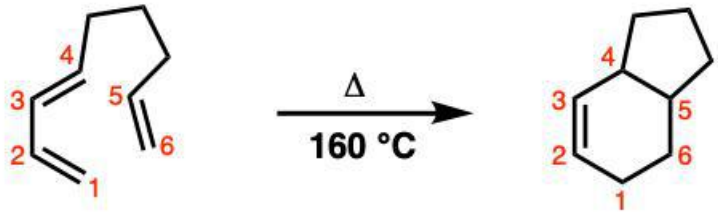
24704 **120 MINUTES**

1. The following reaction is an example of ----- reaction.



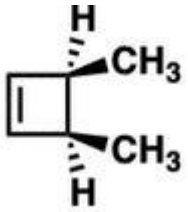
A) Stereospecific B) Diastereoselective
C) Enatioselective D) Regioelective

2. The following reaction is an example of ------ reaction.



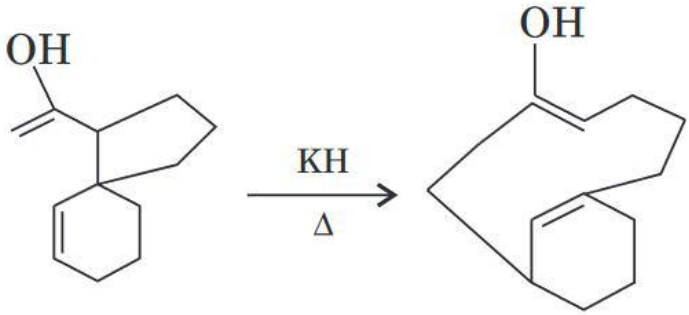
A) Group transfer B) Sigmatropic
C) Electocyclic D) Cycloaddition

3. When the molecule given below undergoes thermal electrocyclic ring opening the product formed will be:



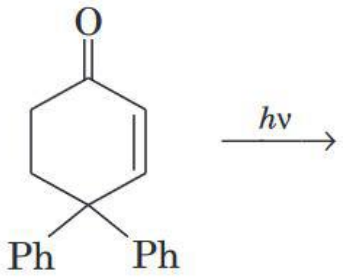
A) (2Z,4E)-2,4-hexadiene B) (2E,4E)-2,4-hexadiene
C) (2Z,4Z)-2,4-hexadiene D) Cannot predict stereochemistry

4. The transformation described below involves ------ Sigmatropic rearrangement.

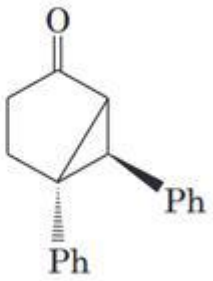


A) [1,5] B) [2,3] C) [3,3] D) [1,7]

5. Identify the major product of the reaction given below:



A)



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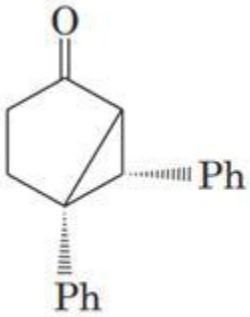

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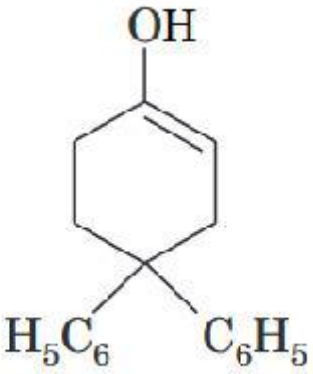
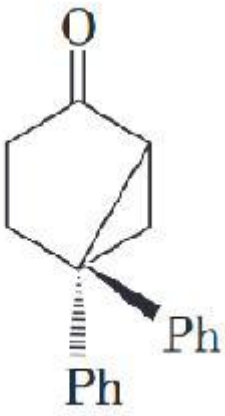
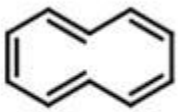


D)



6. Which of the following molecule is non-aromatic in nature?

A)



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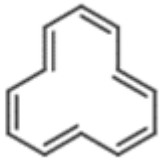
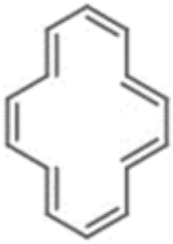
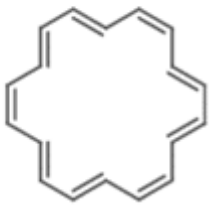


C)



D)



7. Which of the following compound can release a proton easily in a strong basic medium?
   A) Cyclobutadiene B) Cyclopentadiene
   C) Cycloheptatriene D) Cyclooctatetraene

8. The mechanism of Beckmann rearrangement involves----- shift of alkyl group onto electron deficient-----.
   A) 1,2 ; nitrogen B) 1,2 ; carbon
   C) 1,4 ; carbon D) 1,4 ; oxygen

9. The ion which possess the highest coagulating capacity against ferric hydroxide sol:
   A) Ca^{2+} B) PO_4^{3-} C) Al^{3+} D) CO_3^{2-}

10. The metal present in oxygen evolving complex of photosystem-II which assist electron transfer process is:
   A) Fe B) Cu C) Mn D) Co

11. Ce^{4+} ion shows orange colour due to---- transition.
   A) d-d B) f-f
   C) Charge transfer D) Spin allowed

12. For the complex $[CoF_6]^{3-}$, the crystal field stabilization energy in terms of Δ_o is:
   A) 1.2 B) 0.8 C) 0.6 D) 0.4

13. The complexometric indicator used for the determination of calcium in presence of magnesium and other metals is----- reagent.
   A) Pfitzer-Moffat B) Patton and Reeder
   C) Barfoed's D) Wij's

14. The material used in ion exchange and molecular sieves:
   A) Talc B) Silica gel C) Permutit D) Misch metal

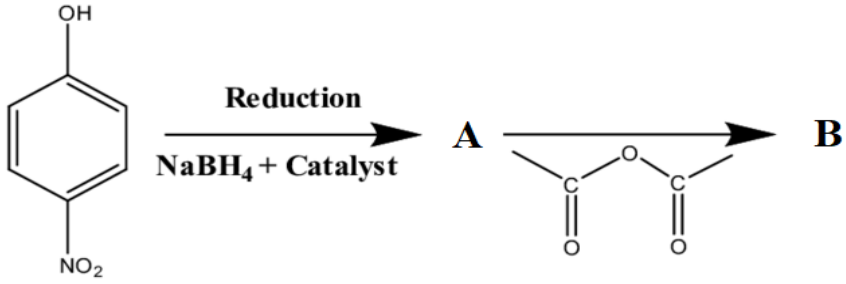
15. The metalloprotein functions as electron carrier is:
   A) Transferrin B) Myoglobin C) Cytochrome D) Chlorophyll

16. Which of the following **cannot** be used as a precursor to the biosynthesis of steroids?
   A) Squalene B) Lanosterol
   C) Geranyl pyrophosphate D) Retinol

17. The formula of inorganic benzene is:
   A) $B_3N_3H_6$ B) $H_3B_3O_3$ C) $(PNX_2)_n$ D) S_4N_4

18. The temperature at which the average speed of gas molecules becomes double that of at the temperature of 27°C is:
   A) 327°C B) 927°C C) 1200°C D) 600°C

19. Identify the product B of the following reaction:



A) Paracetamol B) Aspirin
C) Phenobarbital D) Phenacetin

20. When 340 g of ammonia is decomposed at STP, the volume of nitrogen produced in litres is:
A) 140 B) 170 C) 448 D) 224

21. Consider that a process is both endothermic and spontaneous, then the correct statement is:
A) $\Delta G > 0$ B) $\Delta S > 0$ C) $\Delta S < 0$ D) $\Delta H = 0$

22. Bond order predicted for F_2^{2+} according to molecular orbital theory is:
A) 2 B) 1 C) 0.5 D) 1.5

23. Which of the following molecule possess sp^3d^2 hybridisation?
A) IF B) IF_3 C) IF_7 D) IF_5

24. The product X in the following reaction is:
$XeF_6 + SiO_2 \rightarrow X + SiF_4$

A) $XeOF_2$ B) $XeOF_4$ C) XeO_3 D) XeO_2F_2

25. The magnetic moment of $[Co(H_2O)_6]^{2+}$ is 4.0 BM. The electronic configuration of the complex is:

A) $t_{2g}^5\, e_g^2$ B) $t_{2g}^6\, e_g^1$ C) $t_{2g}^5\, e_g^1$ D) $t_{2g}^4\, e_g^3$

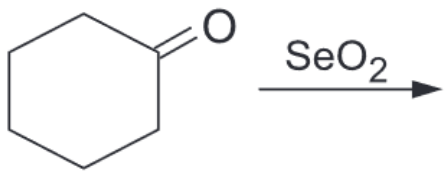
26. Maximum oxidation state shown by the element osmium is:
A) +4 B) +5 C) +6 D) +7

27. The species which does **not** show disproportionation reaction is:
A) ClO_2^- B) ClO_3^- C) ClO_4^- D) ClO^-

28. Which of the following complex is paramagnetic in nature?
A) $[V(CO)_6]$ B) $[Mo(CO)_6]$ C) $[Fe(CO)_6]$ D) $[Ni(CO)_6]$

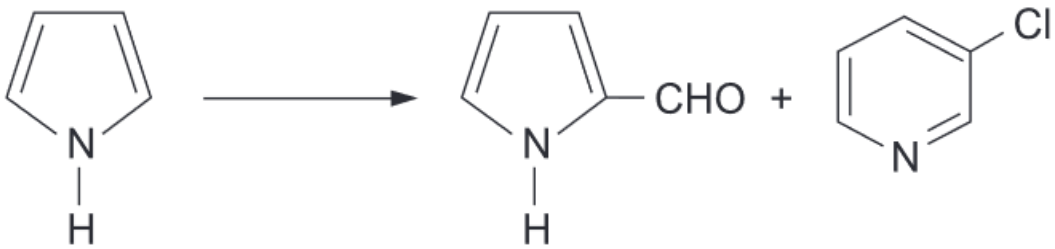
29. The metal carbonyl which does not obey 18- electron rule is:
A) $[Co(CO)_4]$ B) $[Mn(CO)_5Cl]$ C) $[Mn_2(CO)_{18}]$ D) $[Mn(CO)_5CH_3]$

30. Product of the following reaction is:



A) 2-Cyclohexene-1-one B) Cyclohexene
C) Cyclohexane D) Cyclohexan-1,2-dione

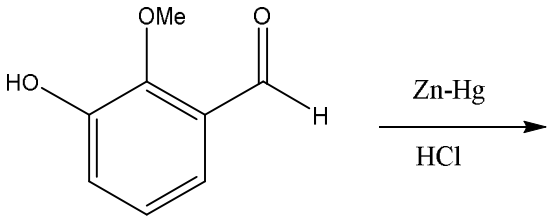
31.



The reagent used for the above conversion is:

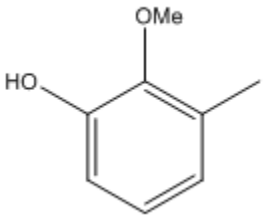
A) OsO_4/ether B) DCC/DMAP C) $CHCl_3$/KOH D) $KMnO_4/H^+$

32.

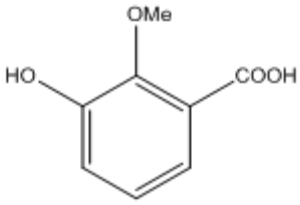


Identify the product of the above reaction.

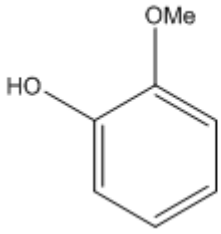
A)



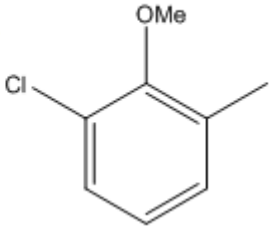
B)



C)



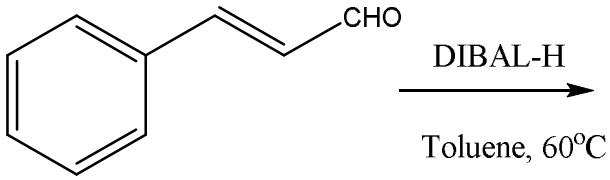
D)



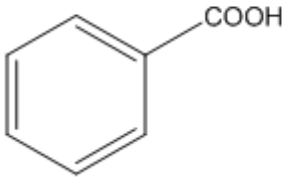
33. Methyl magnesium chloride on treatment with carbon dioxide followed by acid workup will yield:

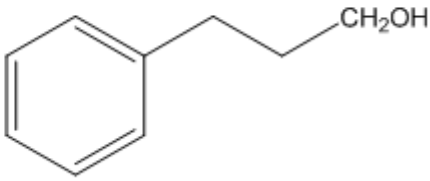
A) Methanol B) Acetic acid C) Ethanol D) Acetaldehyde

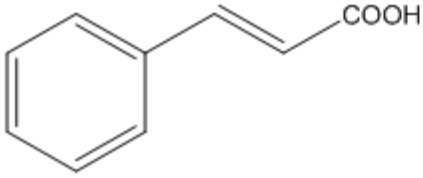
34.

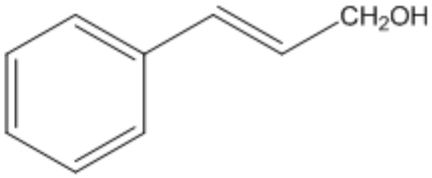


The resultant product of the reaction is:

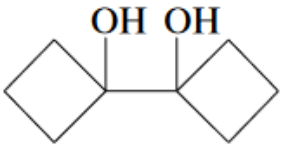
A) 

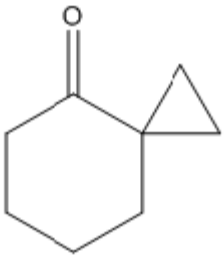
B) 

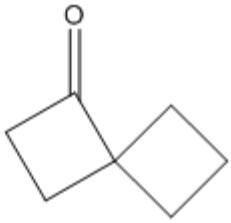
C) 

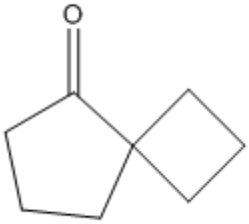
D) 

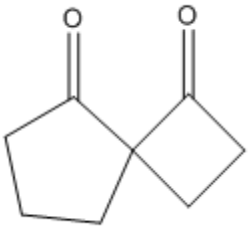
35. Pinacol rearrangement of the following compound will produce:



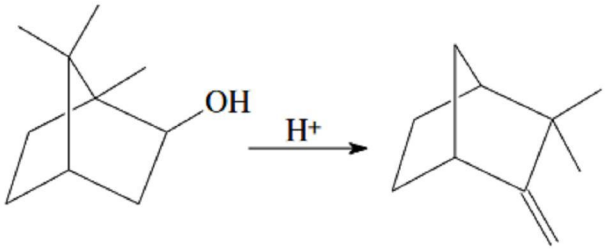
A) 

B) 

C) 

D) 

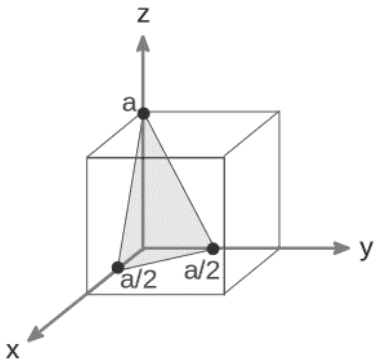
36.



The above reaction is best described as ---- rearrangement.

A) Wagner-Meerwin B) Fries
C) Cope D) Claisen

37. The diagram shows a highlighted plane intersecting main crystallographic axes of the solid. The Miller indices of the plane is:



A) (122) B) (221) C) (112) D) (212)

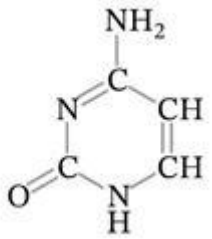
38. Assertion (A): The hydrolysis of ethyl acetate using dilute hydrochloric acid is a pseudo first order reaction.
Reason (R): HCl act as the catalyst for the ester hydrolysis.

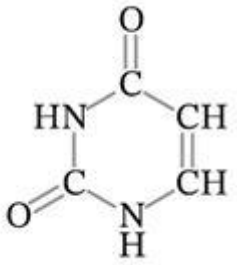
A) Both (A) and (R) are correct and (R) is the correct explanation of (A)
B) Both (A) and (R) are correct but (R) is the not the correct explanation of (A)
C) (A) is correct but (R) is wrong
D) (A) is wrong but (R) is correct

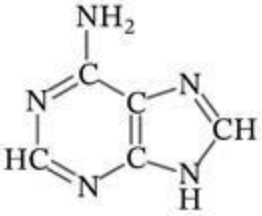
39. Identify the polyester among the polymers given below:
A) Dacron B) Teflon C) Nylon 6,6 D) Bakelite

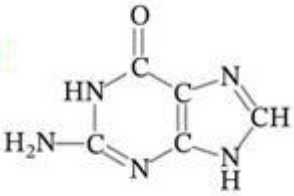
40. Which of the following amino acid contain heterocyclic ring?
A) Tyrosine B) Aspartic acid
C) Glutamine D) Histidine

41. One of the following nitrogenous base is present only in RNA which is:

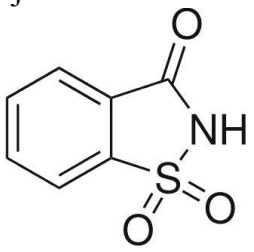
A) 

B) 

C) 

D) 

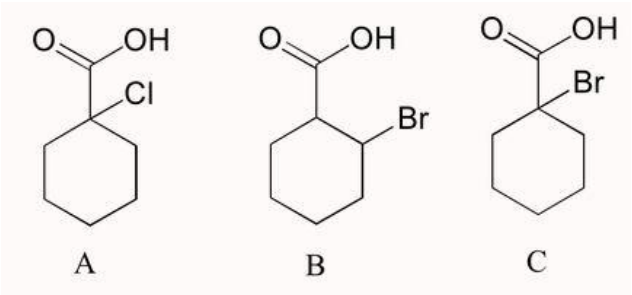
42. The major use of the molecule shown below is:



A) Food preservative B) Analgesic
C) Artificial sweetener D) Antacid

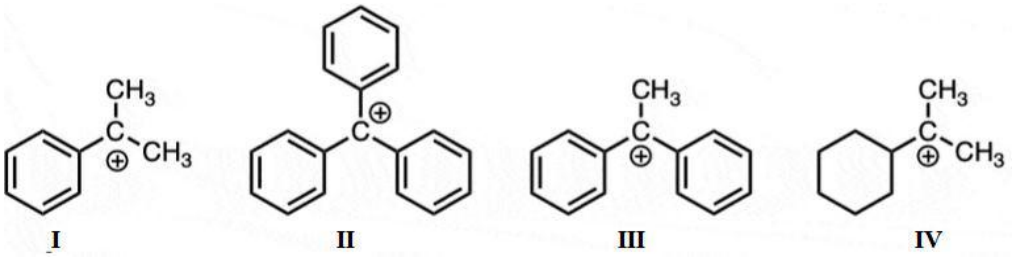
43. Biodegradable polymer Nylon-2,6 is synthesized from:
A) Glycine and aminocaproic acid
B) Glycine and adipic acid
C) Alanine and adipic acid
D) Hexamethylenediamine and alanine

44. Arrange the compounds shown below based on the acidic strength, from most acidic to least acidic:



A) A > C > B B) A> B > C C) B > C > A D) C > B > A

45. Rank the following ionic species based on their stability.



A) IV > III > I > II B) II > III > IV > I
C) III > II > I > IV D) II > III > I > IV

46. In rotational spectroscopy, If B is the rotational constant and J is the rotational quantum number, the energy difference between adjacent rotational energy levels in rigid rotor approximation:
A) Increases with increase in J value
B) Decreases with increase in J value
C) Is equal to 2B
D) Depends on the temperature

47. TiO_2 crystallises with unit cell dimensions $a = b \neq c$ and crystal angles $\alpha = \beta = \gamma = 90^o$ and then it belongs to ----crystal system.
A) Orthorhombic B) Tetragonal C) Monoclinic D) Trigonal

48. The volatilization gravimetric technique where the parameter dH/dt or heat flow is plotted against T is:
A) Differential thermal analysis
B) Thermogravimetric analysis
C) Differential scanning calorimetry
D) Derivative thermogravimetry

49. The ground state term symbol $^5D_4$ belongs to:
A) Mn^{2+} B) Co^{3+} C) V^{3+} D) Fe^{2+}

50. Which of the following compound shows only four peaks in the Carbon-13 NMR spectrum?
A) 2-methylpropane B) Pentan-2-one
C) Pentan-3-one D) Butanone

51. The lanthanide contraction is due to ----- electrons.
A) Perfect shielding of 3d B) Perfect shielding of 4f
C) Large atomic radius of D) Poor shielding effect of 4f

52. In nephelometry, determination of amount of turbidity do not depends upon:
A) Concentration B) Transmission and scattering of light
C) Viscosity D) Size distribution of particles

53. The analytical technique which is an application of photoelectric effect is:
A) STEM B) DEPT C) XPS D) AAS

54. If kinetic energy (E) and mass (m) of the particle is given, its de Broglie wavelength can be calculated using the equation:

A) $\lambda = \frac{h}{\sqrt{mE}}$ B) $\lambda = \frac{h}{\sqrt{2mE}}$ C) $\lambda = \frac{h^2}{\sqrt{mE}}$ D) $\lambda = \frac{h}{\sqrt{mE^2}}$

55. Which of the following molecules cannot produce rotational spectrum?
A) HI B) CO C) CH_3Cl D) CH_4

56. When deoxyhemoglobin binds with oxygen, the bond order----- and hence n_{str} of O_2---.
A) decreases, decreases B) increases, increases
C) decreases, increases D) increases, decreases

57. Consider 'n' as a quantum number, 'm' the mass of particle, 'c' velocity of light, then the energy of particle confined in an one dimensional box of length l is proportional to:
A) n^2 B) m^2 C) l3 D) c^2

58. In Hammett plot, the s_{meta} values via induction for the substituents in benzoic acid follows the order :
A) -CN > $-OCH_3$> $-NH_2$ B) $-NH_2$> $-OCH_3$> -CN
C) $-OCH_3$> -CN > $-NH_2$ D) $-NH_2$> -CN > $-OCH_3$

59. The oxidation number of sulphur in H_2SO_3, $H_2S_2O_4$, H_2SO_4, $H_2S_2O_6$ respectively are:
A) +3, +5, +4, +5 B) +5, +3, +4, +4
C) +4, +3, +4, +5 D) +3, +4, +4, +5

60. Miscelles from ionic surfactants can be formed only above a certain temperature called ---- temperature.
A) Critical B) Kraft C) Boyle D) Inversion

61. Match the spectroscopic techniques given in List I with the range of electromagnetic radiation in List II.

List I	List II
a. Mossbauer spectroscopy	1. Radio wave
b. Electronic spectroscopy	2. UV-Visible
c. ESR spectroscopy	3. Gamma ray
d. NMR spectroscopy	4. Microwave

A) a-3, b-2, c-1, d-4 B) a-2, b-1, c-4, d-3
C) a-1, b-2, c-3, d-4 D) a-3, b-2, c-4, d-1

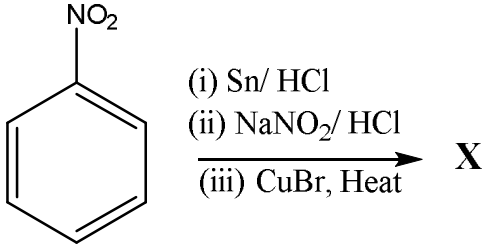
62. Michaelis constants for an enzyme catalyzed reaction at 25°C are given as $K_3 = 0.20 \times 10^3\ s^{-1}$, $0.60 \times 10^3\ s^{-1}$, $K_s = 7.0 \times 10^{-6}$ mol L^{-1}, $K_p = 100 \times 10^{-6}$ mol L^{-1}. Find the equilibrium constant $[P]_{eq} / [S]_{eq}$.

A) 2.2 B) 4.8 C) 6.0 D) 8.6

63. Hydrolysis of phosphorus trichloride will produce:

A) Hypophosporous acid B) Phosphorous acid
C) Orthophosphoric acid D) Peroxophosphoric acid

64.



The product X of the above reaction is:

A) p-chloronitrobenzene B) o-bromonitrobenzene
C) o-bromoaniline D) Bromobenzene

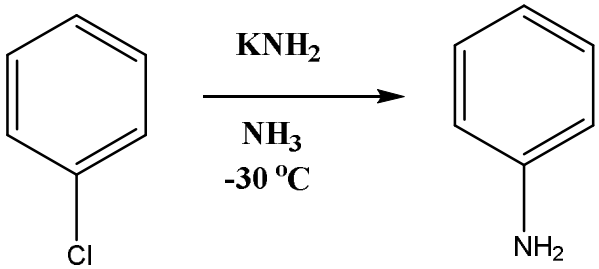
65. In degradation of peptides, a reaction of phenylisothiocyanate with the free amino group of the N-terminal residue is performed where one aminoacid is removed at a time and identified using electrophoresis or chromatography as---- derivative.

A) Phenylthiocarbamoyl B) Phenylthiohydantoin-amino acid
C) Thiazolinone D) Thiazolone

66. The maximum work or the free energy obtained from a Daniel cell is:
(Given that $E^o_{Zn^{2+}/Zn} = -0.76$ V, $E^o_{Cu^{2+}/Cu} = +0.34$ V)

A) 106150 J B) 212300 J C) -106150 J D) -212300 J

67. The intermediate involved in the following conversion is:

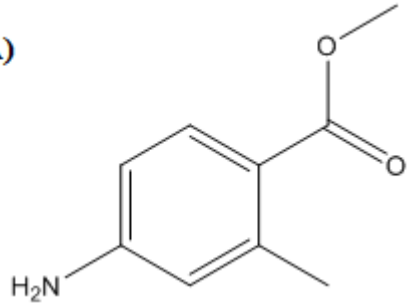


A) Carbocation B) Carbanion C) Free radical D) Benzyne

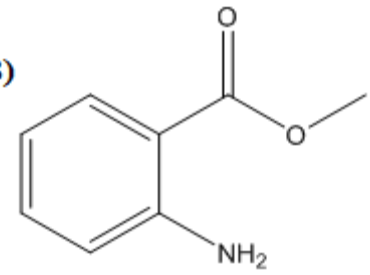
68. Which of the following alkali metal halide has the highest lattice energy?
A) NaCl B) LiCl C) KCl D) CsCl

69. ^{1}H NMR chemical shift data for an organic compound X is given. d (ppm) 7.9 (d, 2H), 6.6 (d,2H), 4.3 (q, 2H), 4.0 (s, 2H), 1.4 (t, 3H). The structure of the compound X is:

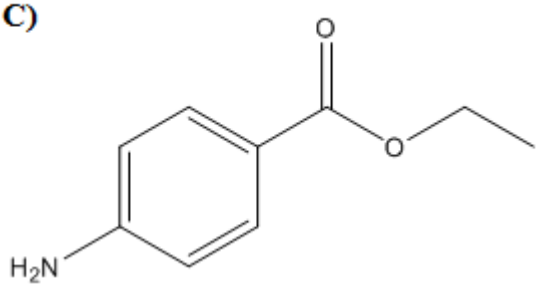
A)



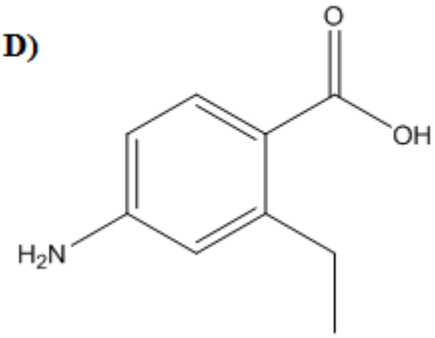
B)



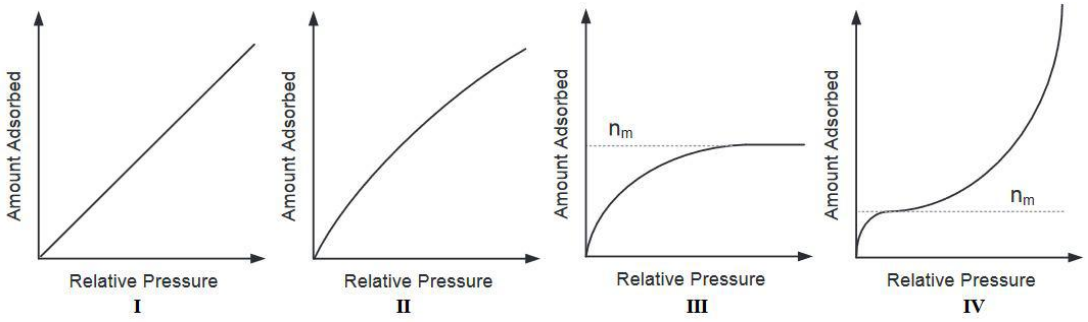
C)



D)



70. Choose the correct description of Freundlich adsorption isotherm from the diagrams given below:

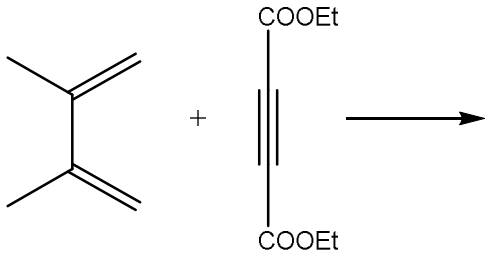


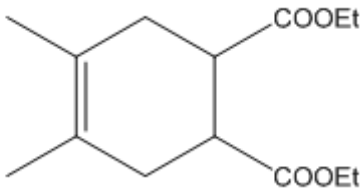
A) I and II only B) II only
C) III and IV only D) IV only

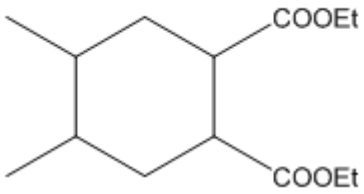
71. Which of the following is **not** square planar complex?

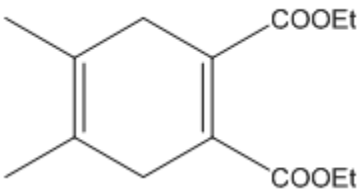
A) $[Ni(CN)_4]^{2-}$ B) $[PdCl_4]^{2-}$ C) $[CdCl_4]^{2-}$ D) $[Cu(NH_3)_4]^{2+}$

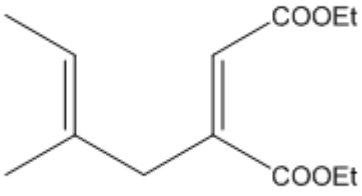
72. The product of the following reaction is:



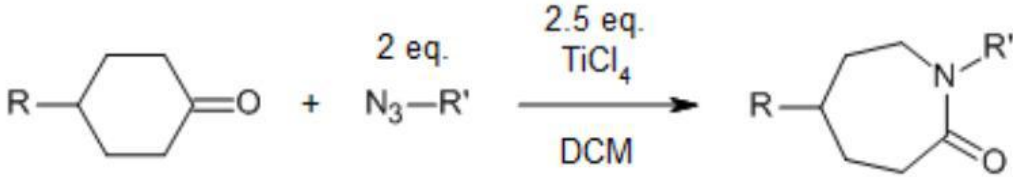
A)


B)


C)


D)


73. The below transformation is called:



A) Schmidt rearrangement
B) Claisen condensation
C) Perkin reaction
D) Wittig reaction

74. The reagent used for the following transformation is:

A) Grignard reagent
B) DIBAL
C) Lithium aluminium hydride
D) Lithium metal in liquid ammonia

75. Two centred B – B bonds in boranes is represented by which of the following in styx:

A) s B) t C) y D) x

76. Choose the odd with regard to hybridisation of the central atom from among the following:

A) NO_3^- B) CO_3^{2-} C) PO_4^{3-} D) SO_3

77. The number of radial nodes in 4f orbitals is:

A) 3 B) 2 C) 1 D) 0

78. Given below are four statements. Which among them is/are true?

1. Actinides have a higher tendency to form complexes.
2. Actinides form oxo-cations while lanthanides do not
3. All actinides are radioactive while none of the lanthanides are radioactive
4. The highest oxidation state exhibited by both lanthanides and actinides is +4.

A) 1 only B) 2 and 4 only
C) 1 and 2only D) 1, 2 and 3only

79. The CFSE for $[CoCl_4]^{2-}$, $[CoBr_4]^{2-}$, $[CoI_4]^{2-}$and $[Co(NCS)_4]^{2-}$ follows the order:

A) $[Co(NCS)_4]^{2-} > [CoCl_4]^{2-} > [CoBr_4]^{2-} > [CoI_4]^{2-}$

B) $[CoI_4]^{2-} > [CoBr_4]^{2-} > [CoCl_4]^{2-} > [Co(NCS)_4]^{2-}$

C) $[Co(NCS)_4]^{2-} > [CoI_4]^{2-} > [CoBr_4]^{2-} > [CoCl_4]^{2-}$

D) $[CoCl_4]^{2-} > [CoBr_4]^{2-} > [CoI_4]^{2-} > [Co(NCS)_4]^{2-}$

80. Identify the wrongly matched pair (Coordination Compound-Name):

A) $[Zn(OH)_4]^{2-}$ - Tetrahydroxozincate(II) ion
B) $Na_3[Cu(CN)_4]$ - Sodium tetracyanocuprate(I)
C) $[Ni(NH_3)_4C_2O_4]$ - Tetraammineoxalatonickel(IV)
D) $[Cd(H_2O)_4](NO_3)_2$ - Tetraaquacadmium(II) nitrate

81. The IUPAC name of Vaska's Complex is:

A) *trans*-carbonylchlorobis(triphenylphosphine)iridium(I)
B) *cis*-carbonylchlorobis(triphenylphosphine)iridium(I)
C) *trans*-carbonylchlorobis(triphenylphosphine)iridium(III)
D) *cis*-carbonylchlorobis(triphenylphosphine)iridium(III)

82. Lowest pKa value is expected for which of the following compounds:

A) $CH_3–CH_2–COOH$ B) $CH_2=CH–COOH$
C) C_6H_5COOH D) $CH^1C–COOH$

83. Match List I containing Metals with List II containing the in biological systems in which they are part of:

List I	List II
a. Fe	1. Vitamin B_{12}
b. Mg	2. Azurin
c. Co	3. Chlorophyll
d. Cu	4. Myoglobin

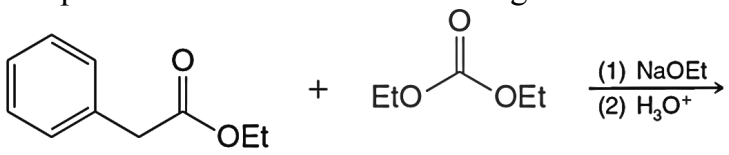
A) a-1, b-3, c-4, d-2 B) a-2, b-1, c-3, d-4
C) a-4, b-3, c-1, d-2 D) a-2, b-1, c-4, d-3

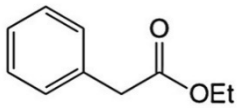
84. With regard to the stability and reactivity of pyridine, which among the following statements are correct?
1. It is a very unreactive aromatic imine
2. The lone pair of pyridine's nitrogen atom is not delocalized.
3. It is less reactive than benzene in aromatic electrophilic substitution reactions
4. Pyridines can undergo electrophilic substitution only if they are activated by electron-donating substituents

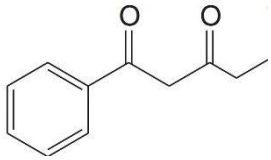
A) 1, 2, 3 &4 B) 1, 2 & 3 only
C) 1, 2 &4 only D) 3 & 4 only

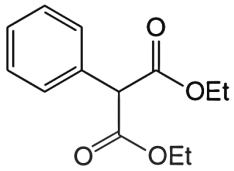
85. Given below are few meta directing substituents. Which among them is the most deactivating?
A) –CN B) –COOH C) $–NO_2$ D) $–SO_3H$

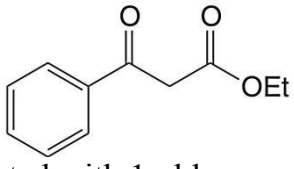
86. The product obtained in the reaction given below is :



A)


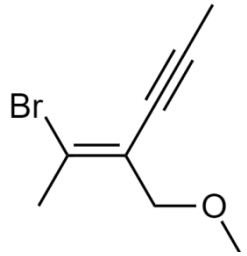
B)


C)


D)


87. The major product obtained when benzene is treated with 1-chloropropane in presence of $AlCl_3$.
A) n-propylbenzene B) Cumene
C) 3-phenylpropene D) Mesitylene

88. The IUPAC name of :



A) (E)-2-Bromo-3-(methoxymethyl)hex-2-en-4-yne
B) (E)-5-Bromo-4-(methoxymethyl)hex-4-en-2-yne
C) (Z)-2-Bromo-3-(methoxymethyl)hex-2-en-4-yne
D) (Z)-5-Bromo-4-(methoxymethyl)hex-4-en-2-yne

89. An organic compound was obtained in an enantiomerically pure state. 28 mg of it was dissolved in 1 cm^3 of ethanol, the solution was placed in a 10 cm long polarimeter cell at 20°C. An optical rotation a of –4.35° was measured with light of wavelength 589 nm. The specific rotation of the said compound is -----.
A) –15.535 B) –155.35 C) –483.58 D) –91.51

90. Let P and Q represent cis and trans-1, 3-dimethylcyclohexane respectively. Which of the statements are TRUE of this pair?
1. both methyl groups are either axial or equatorial in P
2. one methyl in axial and the other is equatorial in P
3. both methyl groups are either axial or equatorial in Q
4. one methyl in axial and the other is equatorial in Q

A) 1 and 4 only B) 1 and 3 only C) 2 and 3 only D) 2 and 4 only

91. Given below are few processes usually depicted in a Jablonski diagram?

1.	Absorption	2.	Fluorescence
3.	Internal Conversion	4.	Intersystem Crossing
5.	Phosphorescence	6.	Vibrational Relaxation

Which among these represent the correct nature of these processes?

A) 1, 2& 5 are only radiative B) 2, 4 & 5 are only radiative
C) 2 & 5 are only radiative D) 3 , 4 &6 are only radiative

92. Match the vitamins in List I with their deficiency diseases List II.

List 1	List II
a. Vitamin A	1. Beriberi
b. Vitamin B_1	2. Keratomalecia
c. Vitamin B_3	3. Megaloblastic anemia
d. Vitamin B_{12}	4. Pellagra

A) a-4, b-2, c-3, d-1 B) a-3, b-1, c-4, d-2
C) a-2, b-4, c-1, d-3 D) a-2, b-1, c-4, d-3

93. The intensive property among the following are:
1. Electrical conductivity 2. Density 3. Volume
4. Entropy 5. Viscosity

A) 3 & 4 only B) 2, 4 &5 only C) 1,2 &5 only D) 2, 3&4 only

94. Fermions are particle requiring:
A) antisymmetric wave functions and having half-integral spin
B) symmetric wave functions and having integral spin
C) antisymmetric wave functions and having integral spin
D) symmetric wave functions and having half-integral spin

95. The rate constant of a reaction is given by the equation $k = Ae^{-Ea/RT}$. For a reaction to proceed faster, which factor in the above equation should be decreased?
A) A B) Ea C) T D) None of these

96. Consider the electrochemical cell Ag|AgCl|MCl(0.01M)|MCl(0.02M)|AgCl|Ag. The junction potential in this case will be the highest when M^+ is:
A) Li^+ B) Na^+ C) K^+ D) H^+

97. The uncertainty in the momentum of an electron if the uncertainty in its position is 1Å would be ($h=6.625 \times 10^{-34}$ kgms^{-1})
A) 5.275×10^{-25} kgms^{-1} B) 4.77×10^{-25} kgms^{-1}
C) 6.625×10^{-24} kgms^{-1} D) 5.714×10^{-47} kgms^{-1}

98. Hydrogen bond is absent in
A) HF B) Water C) Liquid HCl D) Liquid NH_3

99. The shape of I_3^+ and I_3^- according to VSEPR theory are
A) Bent and Linear B) Tetrahedral and T shaped
C) Seesaw shaped Linear D) Both linear

100. Which among the following molecule-point group pair is wrongly matched?
A) Boron trifluoride – D_{3h} B) *p*-dichlorobenzene – D_{2h}
C) Allene – D_{2d} D) Ferrocene *(stag.)* – D_{5d}

101. The number of C_4 and S_4 axes present in methane is:
A) 0 & 4 B) 4 and 0 C) 4 and 4 D) 0 and 0

102. Which among the following are abelian groups?
C_{2v}, C_{3v}, C_{2h}, D_{2h}, C_{4v}

A) C_{2v} & D_{2h} only B) C_{3v} & C_{4v}only
C) C_{2v} & C_{2h}only D) C_{2v}, C_{2h} & D_{2h}only

103. A_g, B_g, A_u and B_u are the irreducible representations of C_{2h}. The Raman active modes of trans-1,3-butadiene *(Point group: C_{2h})* are:

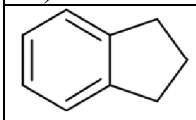
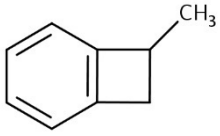
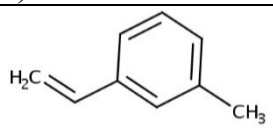
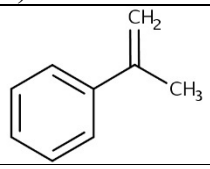
The character table is given below.

C_{2h}	E	C_2	i	σ_h		
A_g	1	1	1	1	R_z	x^2, y^2, z^2, xy
B_g	1	–1	1	–1	R_x, R_y	xz, yz
A_u	1	1	–1	–1	z	
B_u	1	–1	–1	1	x, y	

A) A_g and B_g B) A_g and A_u C) A_u and B_g D) B_g and B_u

104. The number of lines in the ESR spectrum of the radical anion of benzene and naphthalene are respectively:
A) 7 and 25 B) 7 and 11 C) 6 and 22 D) 6 and 27

105. An organic compound having molecular formula C_9H_{10} shows the following spectral data:
^{1}H NMR (d, CDCl3): 2.1 (pentet, 2H), 2.9(t, 4H), 7.25(s, 4H)
^{13}C NMR: 25.3(t), 32.8(t), 124.2 (d), 125.9 (d), 143.9(s)
The structure of the compound is:

A)	B)	C)	D)
			

106. Mossbauer spectrum of sodium nitroprusside consists of :
A) singlet B) doublet C) triplet D) multiplet

107. The number of significant figures in 51771, 5.1771, 0.51771, 0.051771 are respectively:
A) 1, 1, 1, 1 B) 5, 5, 6, 6 C) 5, 5, 5 & 7 D) 5, 5, 5 & 5

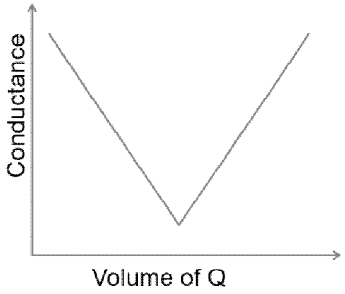
108. Water may be trapped in pockets during the precipitation of $AgNO_3$. This can be termed as:
A) Occlusion B) Inclusion C) Digestion D) Adsorption

109. The number of plates resulting in the chromatographic peak with retention time 52.5 mm and base peak width 10 mm is approximately:
A) 220 B) 440 C) 1158 D) 2315

110. The nature of Stationary and Mobile Phases in reverse-phase partition chromatography is:

A) Stationary phase – Polar; Mobile phase – Polar
B) Stationary phase – Non-polar; Mobile phase – Non-polar
C) Stationary phase – Polar; Mobile phase – Non-polar
D) Stationary phase – Non-polar; Mobile phase – Polar

111. The conductometric titration curve of an acid **P** and an alkali **Q** is given below. Here P and Q respectively is most probably



A) CH_3COOH and NaOH B) CH_3COOH and NH_4OH
C) HCl and NaOH D) NaOH and CH_3COOH

112. The fast neutrons in Fast Neutron Activation Analysis possess energies in the range of ----.

A) 0 to 0.01 eV B) 0.01 to 0.025 eV
C) 0.1 to 1.0 eV D) 0.5 – 20 MeV

113. 'Reduce derivatives' is a Green Chemistry Principle. It means:

A) Find new applications for parent compounds and do not go for new derivatives
B) Unnecessary derivatization (use of blocking groups, protection/ deprotection) should be minimized or avoided if possible
C) Chemical products should be designed so that at the end of their function they break down into harmless products that do not persist in the environment
D) It is better to prevent waste than to treat or clean up waste after it has been created

114. Which among the following can be considered to be green solvents?

A) Deep Eutectic mixtures B) Bio-based solvents
C) Supercritical fluids D) All the above

115. Ozone layer is part of the:

A) Mesosphere B) Stratosphere
C) Thermosphere D) Troposphere

116. Given below are few polymers and their monomers. Which of them is **wrongly** matched?

A) Plexiglass - Methylmethacrylate
B) Nylon 6 - Adipic acid
C) Teflon - Tetrafluroethene
D) Orlon - Acrylonitrile

117. Which among the following is **not** a thermoplastic?

A) PEEK B) Cellulose acetate
C) Polystyrene D) Melamine resin

118. The antimicrobial drug Salvarsan contains the metal _____.

A) Se B) As C) Ag D) Au

119. Identify the correct statements related to IC_{50}?

1. It indicates how much a drug is needed to inhibit a biological process by half
2. Dose that specifies the action of a drug in 12 hrs
3. Higher the IC_{50} value, Better the drug
4. IC_{50} is usually expressed in molar concentrations

A) 1 & 4 only B) 2 & 3 only C) 1 & 3 only D) 3 & 4 only

120. Which among the following is not an essential amino acid?

A) Isoleucine B) Leucine C) Threonine D) Tyrosine