CHEMICAL SCIENCES

This Test Booklet will contain 120 (20 Part ‘ A’+ 40 Part ‘ B’ + 60 Part ‘ C’) Multiple Choice Questions (MCQs). Candidates will be required to answer 15 in part ‘A’, 35 in Part ‘B’ and 25 questions in Parts ‘C’ respectively (No. of question to attempt may vary from exam to exam). In case any candidate answers more than 15, 35 and 25 questions in Parts A, B and C respectively only first 15, 35 and 25 questions in Parts A, B and C respectively will be evaluated. Questions in Parts ‘A’ and ‘ B’ carry two marks each and Part ‘C’ questions carry four marks each. There will be negative marking @ 25% for each wrong answer. Below each question, four alternatives or responses are given. Only one of these alternatives is the CORRECT answer to the question.

MODEL QUESTION PAPER

PART A

May be viewed under heading “General Science”

PART B

21. $[CoCl_4]^{2-}$ shows a deep blue colour because of
1. metal to ligand charge transfer transition
2. ligand to metal charge transfer transition
3. spin allowed and Laporte forbidden d-d transition
4. spin allowed and Laporte allowed d-d transition

22. The violet colour of iodine vapour is due to
1. $n \rightarrow n^*$ transition
2. $\pi \rightarrow \pi^*$ transition
3. $n \rightarrow \sigma^*$ transition
4. $\sigma \rightarrow \pi^*$ transition

23. Choose the correct statement among the following
1. diamond has lower thermal and electrical conductivities compared to graphite
2. diamond has similar thermal and electrical conductivities compared to graphite
3. diamond has higher thermal conductivity but lower electrical conductivity compared to graphite
4. diamond has the same thermal but lower electrical conductivity compared to graphite

24. Which of the following is a nido-borane?

1. B_4H_{10}
2. B_5H_9
3. $[B_6H_6]^{2-}$
4. B_5H_{11}

25. Among the three types of orbital s*p*, *d*, and *f*,

1. both *p* and *f* orbitals have centre of symmetry
2. both *p* and *d* orbitals have centre of symmetry
3. only *d* orbitals have centre of symmetry
4. *f* orbitals alone have centre of symmetry

26. The absorbance of solution having 20% transmittance is

1. 0.301
2. 0.699
3. 1.301
4. 1.699

27. The active site of enzyme nitrogenise contains

1. Mo
2. Mn
3. Fe
4. Cu

28. Which one of the following is a free radical?

1. CO
2. CN^-
3. NO
4. CS

29. Choose the 16 e^- complex from the following:

1. $Ni(CO)_4$
2. $Rh(PPh_3)_3Cl$
3. $Fe(CO)_5$
4. $(\eta^6\text{-}C_6H_6)_2Cr$

30. The species having metal-metal bond is:

1. $Mn_2(CO)_{10}$
2. $Al_2(CH_3)_6$
3. $V_2(CO)_{12}$
4. $Al_2(OPr^i)_{12}$

31. The only molecule having bridging oxygen is

1. Phosphorus trioxide
2. Phosphorus pentoxide
3. Cyclic tetraphosphate
4. Pyrophosphate

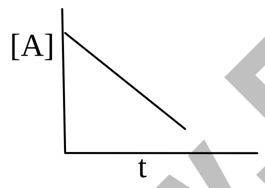
32. The coordination number of phosphorus in $[PMo_{12}O_{40}]^{3-}$ is
1. 2
2. 4
3. 5
4. 6

33. Using phenolphthalein as the indicator, which of the following titration is possible:
1. acetic acid with pyridine
2. oxalic acid with sodium hydroxide
3. hydrochloric acid with aniline
4. sulphuric acid with aqueous ammonia

34. Which of the following species is ESR-active?
1. $VOSO_4$
2. $K_2Cr_2O_7$
3. $KMnO_4$
4. $[Co(NH_3)_6]Cl_3$

35. Large deviation from Trouton's rule is observed for systems which are
1. having more ordered structure
2. having more disordered structure
3. having low melting points
4. having low boiling points

36. The concentration of a reactant decreases linearly with time. What is the order of the reaction?



1. 1^{st} order
2. Fractional order
3. 2^{nd} order
4. Zero order

37. The point group symmetry of the molecule *cis*–ML_4X_2 is
1. C_{4v}
2. D_{4h}
3. C_{2h}
4. C_{2v}

38. The number of rotational degrees of freedom of CO_2 is
1. one
2. two
3. three
4. four

39. The magnitude of the nuclear spin angular momentum of a nuclei is $\sqrt{15}/2\hbar$ units. The value of 1 is
1. 5/2
2. 1/2
3. 1
4. 3/2

40. Which of the following transitions in the electronic spectrum of a homonuclear diatomic molecule is forbidden
1. $\sum_u^+ \rightarrow \sum_g^+$
2. $\sum_g^+ \rightarrow \prod_u$
3. $\sum_u^+ \rightarrow \prod_g$
4. $\sum_g^+ \rightarrow \Delta_u$

41. The diffraction pattern of a cubic solid has an intense 110 Bragg reflection, but the 100 and 111 Bragg reflections are absent. The structure of the solid is
1. Body-centered cubic
2. Primitive cubic
3. Face-centered cubic
4. Edge-centered cubic

42. The logarithmic conductivity of a crystalline solid shows a linear variation with inverse temperature (1/T). The band gap may be obtained from
1. slope of the plot.
2. intercept on the conductivity axis.
3. intercept on the temperature axis.
4. inverse slope

43. The molar masses of monodisperse and polydisperse polymers obey respectively the conditions: ($\bar{M}_n$ = Number average molecular weight and $\bar{M}_w$ = Weight average molecular weight).
1. $\bar{M}_n > \bar{M}_w$ and $\bar{M}_n < \bar{M}_w$
2. $\bar{M}_n = \bar{M}_w$ and $\bar{M}_n < \bar{M}_w$
3. $\bar{M}_n < \bar{M}_w$ and $\bar{M}_n < \bar{M}_w$
4. $\bar{M}_n = \bar{M}_w$ and $\bar{M}_n = \bar{M}_w$

44. The spatial part of hydrogen molecular wave function in the simplest molecular orbital theory is given by σ_g^2 where σ_g is a normalized linear combination of two hydrogen 1s orbitals. Which of the following is true about the above wave function?
1. It contains only covalent terms.
2. It includes only a small amount of ionic terms.
3. It contains only ionic terms.
4. It over estimates the ionic terms.

45. A $2p_z$ orbital of hydrogen atom is an eigenfunction of
1. H only.
2. H and L^2 only
3. H, L^2 and L_z only
4. H, L^2, L_z and L_x

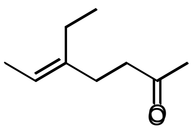
46. By a reversible process, we mean one that always

1. takes infinite time for completion
2. satisfies ΔS (universe) = 0
3. satisfies $\Delta G = 0$.
4. gives the minimum work

47. A hydrogenic 3p orbital has the following form of the radial wavefunction (α_i= constant):

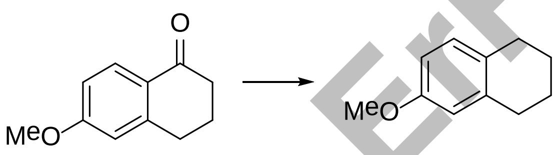
1. $r(\alpha_1 - r)e^{-\alpha_2 r}$
2. $re^{-\alpha_3 r}$
3. $r(\alpha_4 - r)(\alpha_5 - r)e^{-\alpha_6 r}$
4. $r^3 e^{-\alpha_3 r}$

48. IUPAC name for the compound given below is



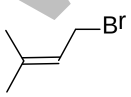
1. *E*-5-ethylhept-5-en-2-one
2. *Z*-5-ethylhept-5-en-2-one
3. *E*-3-ethylhept-2-en-6-one
4. *Z*-3-ethylhept-2-en-6-one

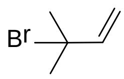
49. The most suitable reagent for the following transformation is

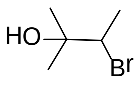


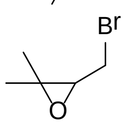
1. $NaBH_4$
2. B_2H_6
3. Zn-Hg/ HCl
4. NH_2NH_2/ HCl

50. The major product formed in the reaction of 2-methyl but-3-en-2-ol with HBr is

1. 

2. 

3. 

4. 

51. Among dimethylcyclobutanes, which one can exhibit optical activity?

1. *cis*-1,2-dimethylcyclobutane
2. *trans*-1,2-dimethylcyclobutane
3. *cis*-1,3-dimethylcyclobutane
4. *trans*-1,3-dimethylcyclobutane

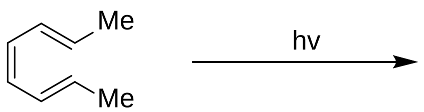
52. The monomer of biopolymer DNA is a

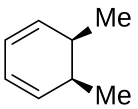
1. nucleotide
2. aminoacid
3. disaccharide
4. fatty acid

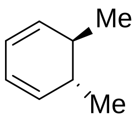
53. The order of chemical shifts (δ value) in the ^{1}H NMR spectrum of crotonaldehyde is

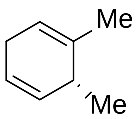
1. olefinic>CHO>Me
2. CHO>Me>olefinic
3. CHO>olefinic>Me
4. olefinic>Me>CHO

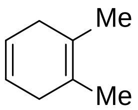
54. The product formed in the reaction given below is



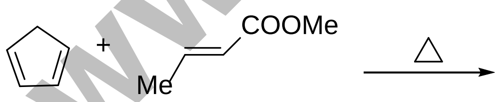
1. 

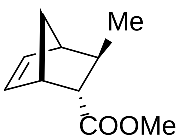
2. 

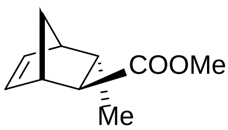
3. 

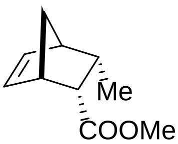
4. 

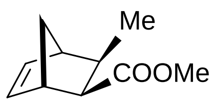
55. The major product formed in the reaction given below is



1. 

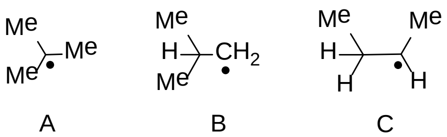
2. 

3. 

4. 

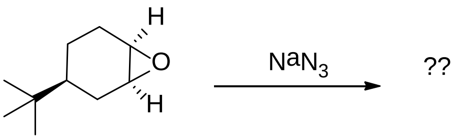
56. The conversion of excited singlet state (S_1) of a molecule to triplet state (T_1) is known as
1. fluorescence
2. phosphorescence
3. intersystem crossing
4. internal conversion

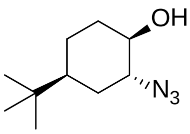
57. The decreasing order of stability of the free radicals **A**, **B** and **C** is

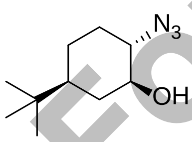


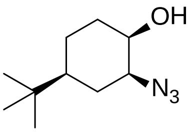
1. A >B >C
2. C >A >B
3. B>A>C
4. A >C >B

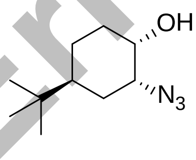
58. The major product formed in the reaction given below:



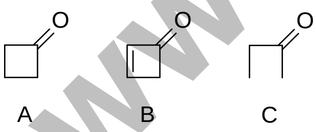
1˙ 

2˙ 

3˙ 

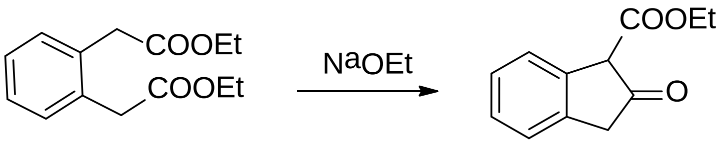
4˙ 

59. The rates of keto-enol tautomerism in the ketones A-C, given below are in the order



1. A >B >C
2. A >C >B
3. C >A >B
4. C >B>A

60. The reaction given below is an example of



1. aldol condensation
2. Knoevenagel condensation
3. Dieckmann condensation
4. acyloin condensation

PART C

61. The covalent radii vary gradually in the Periodic Table. From the orders given below for such radii, the correct ones are

(a) Ce>Lu, (b)Co >Ti,(c) Sr>Ca,(d)I>Se

1. (a) and (b) only
2. (a) and (c) only
3. (a), (c) and (d) only
4. (b), (c) and (d) only

62. The pair of gaseous molecules/ions having tetrahedral structure is

1. $SnCL_4, PH_4^+$
2. $SnCL_4, XeF_4$
3. ICl_4^-, PH_4^+
4. $SnCL_4, ICl_4^-$

63. Consider the following

	Volumetric method for Ag(I)	**Indicator used**
(a).	Fajan method	Chromate
(b).	Mohr's method	Fluorescein
(c).	Vohlard method	ferric salt

The method and indicator matches correctly in

1. (a) and (b) only
2. (b) and (c) only
3. (c) only
4. (b)only

64. An unknown lead solution has diffusion current of 1.0 µA. To a 10 ml of this solution 0.5 ml of 0.04 M lead solution is added. The diffusion current of the spiked solution is 1.50 µA. The concentration of the unknown lead solution is

1. 0.0020 M
2. 0.0050 M
3. 0.0035 M
4. 0.0010 M

65. The^{32} Pradio isotope, used in leukaemia therapy, has $t_{1/2}$=14.26 days. What % of ^{32}P remains after35 days?

1. 30%
2. 8%
3. 81.7%
4. 18.3%

66. On a 30 cm column, the $t_R$of **A** and **B** respectively are16.40 and 17.63 minutes. The t_0 of the column is 1.30 minutes. The peak width at base lines for **A** and **B** are 1.11 and 1.21 minutes respectively. The column resolution R_S is

1. 1.06
2. 1.23
3. 2.12
4. 2.23

67. Which one of the following pairs of electronic configurations of high-spin transition metal ions (3d) in an octahedral field undergoes a substantial Jahn-Teller distortion:

1. d^3, d^9
2. d^4, d^9
3. d^5, d^9
4. d^6, d^9

68. Which one of the following pairs consists of a good oxidizing and a good reducing agent respectively:

1. Ce(IV),Ln(III)
2. Ln(III), Eu(II)
3. Ce(IV), Eu(II)
4. Ln(III), Ce(III)

69. Which one of the pairs of following statements about reduction of $[CoCl(NH_3)_5]^{2+}$ By Cr(II) is correct:

(A). Reactant $[CoCl(NH_3)_5]^{2+}$ has non-labile coordination sphere

(B). Reaction proceeds by outer-sphere mechanism

(C).Reactant $[CoCl(NH_3)_5]^{2+}$has labile coordination sphere

(D). Reaction proceeds by inner-sphere mechanism

1. (A) and (B)
2. (A) and (D)
3. (C) and (B)
4. (C) and (D)

70. Hemocyanin contains

1. a dinuclear copper core and binds dioxygen in the cuprous state.
2. a dinuclear copper core and binds dioxygen in the cupric state.
3. a mononuclear copper core and binds dioxygen in the cuprous state
4. a mononuclear copper core and binds dioxygen in the cupric state.

71. The ^{31}PNMR spectrum of $PF_4N(CH_3)_2$ at room temperature and low temperature (173K) respectively shows (assume that N and H do not couple):

1. triplet and quintet
2. quintet and triplet
3. quintet and triplet of triplets
4. triplet and triplet of triplets

72. The number of hyperfine lines in the EPR spectrum of a one electron reduced product of $[Co_3(CO)_9Se]$(I=7/2 for Co nucleus) is:

1. 8
2. 15
3. 22
4. 1

73. The highest oxidation state of a metal in the following compounds is :
$(\eta^6\text{-}C_6H_6)_2Cr$, $Mn(CO)_5Cl$, $Na_2[Fe(CO)_4]$,$K[Mn(CO)_5]$and $K[Mo(CO)_5Br]$

1. 1
2. 2
3. -1
4. -2

74. The maximum number of valence electrons of a metal in these complexes are: $Mn_2(CO)_{10}$, $(\eta^5\text{-}C_5H_5)Mo(CO)_3Cl$, $(\eta^5\text{-}C_5H_5)_2Ni$, and $(\eta^5\text{-}C_5H_5)_2TiCl_2$

1. 16
2. 18
3. 20
4. 22

75. Olefin hydrogenation using Wilkinson's catalyst initiates with:

1. olefin addition to $Rh(PPh_3)_2Cl$
2. olefin addition to $Rh(PPh_3)_3Cl$
3. a phosphine dissociation from $Rh(PPh_3)_3Cl$
4. a phosphine addition to $Rh(PPh_3)_2Cl$

76. Although Fe(III) is a better Lewis acid compared to Zn(II), most hydrolytic Enzymes contain Zn(II) at the active site because

1. Fe(III) is a redox active ion.
2. Fe(III) has less abundance compared to Zn(II).
3. Fe(III) generally makes octahedral complexes while Zn(II) makes tetrahedral complexes
4. Zn(II) makes kinetically labile complexes.

77. Considering the two complexes (A) $[Ni(H_2O)_6]^{2+}$and (B)$[Ni(NH_3)_6]^{2+}$, the right statement is

1. Complex (A) is diamagnetic and complex (B) is paramagnetic
2. Complex (A) is paramagnetic and complex (B)is diamagnetic
3. Both are paramagnetic
4. Both are diamagnetic

78. Unlike d-d transitions, the f-f transitions

1. do not change much with change in ligand
2. change significantly with change in ligand
3. appear at low energies i.e., at the near-IR region
4. appear as broad bands

79. Strongest super acid among the following is a

1. solution of HNO_3 in H_2SO_4
2. solution of $HClO_4$ in H_2SO_4
3. solution of SbF_5 in HF
4. solution of $SbCl_5$ in HCl

80. Consider the following statements regarding borazine,

A. It is isoelectronic with benzene
B. Each nitrogen receives more σ-electron density from neighbouring boron than it gives away as a π-donor
C. It does not undergo addition reactions
D. Nitrogen retains its basicity and boron its acidity.

The true statements among the above are

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

81. For a diffusion-controlled bimolecular reaction, the rate constant (k_D) is proportional to (T =temperature;η = coefficient of viscosity of medium).

1. ηT
2. $\frac{1}{\eta T}$
3. $\frac{T}{\sqrt{\eta}}$
4. $\frac{T}{\eta}$

82. Consider the unimolecular reaction

A(g) $\rightarrow$ products

For which the following remarks were made.

A. The reaction is second order at low pressure and becomes first order at high pressure.
B. The reaction is first order at low pressure and becomes second order at high pressure.
C. The reaction is zero order

Which of these is/are correct?

1. A and B
2. B and C
3. Only C
4. Only A

83. A random distribution of errors obeys the Gaussian form $\sqrt{A/\pi}\ \exp[-Ax^2]$. The mean and standard deviation of this distribution obeys

1. $\langle x \rangle = 0$ and $\sigma_x = \sqrt{2A}$
2. $\langle x \rangle \neq 0$ and $\sigma_x = 1/\sqrt{2A}$

3. $\langle x \rangle = 0$ and $\sigma_x = \sqrt{A}$
4. $\langle x \rangle = 0$ and $\sigma_x = A$

84. The function $\sin^{-1}x$ is not an acceptable wave function because
1. it is not differentiable
2. its first derivative is not continuous
3. it does not cover the entire space
4. it is not a single-valued function

85. The first-order correction to energy for the ground state of a particle-in-a-box due to a perturbation λx would be
1. $\lambda L/2$
2. λL
3. $2\lambda L$
4. 2

86. Characters of a few symmetry operations are given below. Identify the character of the irreducible representation A'_{2g}

	E	C_n	C_2	i	σ_h
1	1	1	1	-1	-1
2	1	1	-1	1	1
3	1	-1	-1	1	1
4	1	1	-1	-1	1

87. The character of the irreducible representation A_1 in C_{3v} point group is given below

	E	$2C_3$	$3\sigma_v$
A_1	1	1	1

Identify one irreducible representation orthogonal to A_1 among the following.

	E	$2C_3$	$3\sigma_v$
Γ_1	1	-1	1
Γ_2	2	-1	0
Γ_3	2	0	-1
Γ_4	1	-1	-1

1. Γ_1
2. Γ_2
3. Γ_3
4. Γ_4

88. The energy levels of cyclopropene are $\alpha + 2\beta$, $\alpha - \beta$, and $\alpha - \beta$. The delocalization energy in $C_3H_3^-$ is

1. 2β
2. 0
3. β
4. 3β

89. The rotational constant (B) of $H^{35}Cl$, $H^{37}Cl$ and $D^{35}Cl$ follow the order

1. $H^{35}Cl > D^{35}Cl > H^{37}Cl$
2. $H^{35}Cl > H^{37}Cl > D^{35}Cl$
3. $D^{35}Cl > H^{35}Cl > H^{37}Cl$
4. $H^{37}Cl > H^{35}Cl > D^{35}Cl$

90. In a crystal, atom A is at the corners of the unit cell, B is at the centre of the cell and the oxygen atoms are at the face-centred positions. What is the formula per unit cell?

1. A_8BO_6
2. ABO_6
3. A_8BO_3
4. ABO_3

91. On mixing100 mL of 0.1 M CH_3COOH and 50 mL of 0.1 M NaOH, the pH of the solution will be

1. $pk_a + 0.301$
2. pk_a
3. $pk_a - 0.301$
4. $pk_a + 0.477$

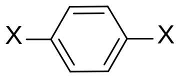
92. Using the fundamental equation dA= -SdT – PdV, the Maxwell relation is

1. $\left(\frac{\partial S}{\partial P}\right)_T = \left(\frac{\partial V}{\partial S}\right)_V$
2. $\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial P}{\partial T}\right)_V$
3. $\left(\frac{\partial T}{\partial V}\right)_T = \left(\frac{\partial P}{\partial S}\right)_T$
4. $\left(\frac{\partial S}{\partial V}\right)_T = \left(\frac{\partial P}{\partial T}\right)_V$

93. The relationship between mean ionic activity coefficient for $Ca_3(PO_4)_2$ and its ions is given by

1. $\gamma_\pm = \gamma_+^3 \gamma_-^2$
2. $\gamma_\pm = \gamma_+^2 \gamma_-^3$
3. $\gamma_\pm^5 = \gamma_+^3 \gamma_-^2$
4. $\gamma_\pm^5 = \gamma_+^2 \gamma_-^3$

94. Assuming that C−H and C−X bond lengths in



are nearly equal, the molar residual entropy at 0 K is

1. 0
2. Rln2
3. Rln3
4. Rln6

95. The contributions to the molar entropy by translational (tr), rotational (rot), vibrational (vib) and electronic (ele) degrees of freedom is in order

1. tr> rot >vib>ele
2. rot>vib>tr>ele
3. ele>vib>rot>tr
4. vib>rot >tr>ele

96. A binary mixture of A_2 and B_2 will show negative deviation from Raoult's law when

1. A−A and B−B interactions are stronger than A−B
2. A−A and B−B interactions are weaker than A−B
3. Both A−A and B−B interactions are equal to A−B
4. Either A−A or B−B interactions is equal to A−B

97. In the presence of external magnetic field the transition $^3D_1 \rightarrow {}^3P_1$ splits into

1. 3
2. 5
3. 7
4. 9

98. Ionic equivalent conductance value for Ca^{2+} is 0.0119 (S m^2mol^{-1}) and for Cl^- is 0.0076 (Sm^2mol^{-1}). The correct expected molar conductivity at infinite dilution for $CaCl_2$ is

1. 0.0195 S m^2mol^{-1}
2. 0.0271 S m^2mol^{-1}
3. 0.0542 S m^2mol^{-1}
4. 0.01355 S m^2mol^{-1}

99. The term symbol for the ground state configuration of NO is

1. $^2\Pi_u$
2. $^2\Pi_g$
3. $^1\Pi_u$
4. $^1\Pi_g$

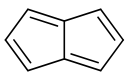
100. The kinetic chain length (ν) is a measure of chain propagation. If the rates of consumption are denoted by R_c and rates of production by R_p; M and $M^{\bullet}$ denote the monomer and the active center, respectively. The correct definition of ν is

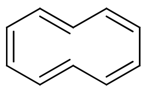
1. $R_c(M)/ R_p(M^{\bullet})$
2. $R_p(M^{\bullet}) / R_c(M)$
3. $R_c(M^{\bullet}) / R_p(M)$
4. $R_c(M)/ R_c(M^{\bullet})$

101. 4-*tert*-Butylcyclohexanoneon reduction gives two isomeric alcohols which are

1. Enantiomers
2. Diasteromers
3. Rotamers
4. Homomers

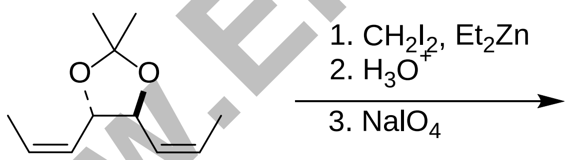
102. For the following compounds **A** and **B** the correct statement is

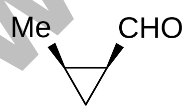

A

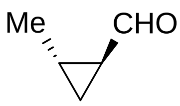

B

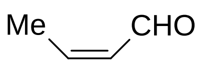
1. **A** is aromatic and **B** is antiaromatic
2. **A** is antiaromatic and B is non-aromatic
3. **A** and **B** are both aromatic
4. **A** and **B** are both non-aromatic

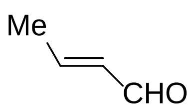
103. Identify the product formed in the following transformations



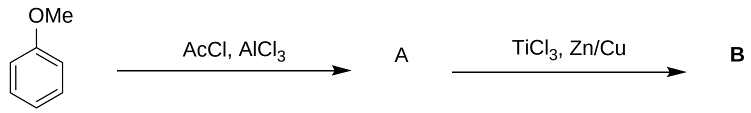
1. 

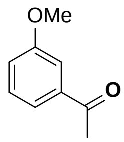
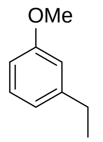
2. 

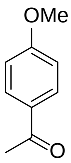
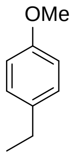
3. 

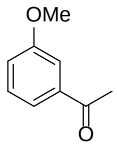
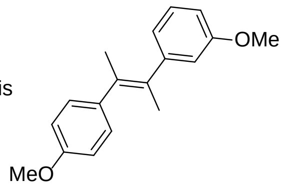
4. 

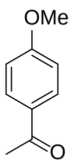
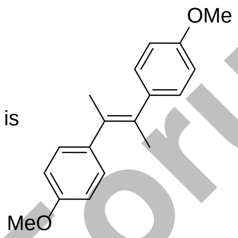
104. Identify the product **A** and **B** in the following reaction sequence



1. **A** is  and **B** is 

2. **A** is  and **B** is 

3. **A** is  and **B** is 

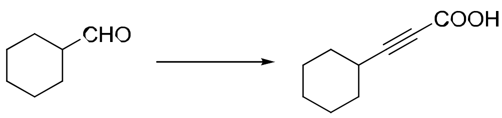
4. **A** is  and **B** is 

105. Match the following:

A. Conversion of 1,7-octadiene to cyclohexene	i) Wacker Oxidation
B. Conversion of bromobenzene to ethylcinnamate	ii) Mc Murry Coupling
C. Conversion of 1-hexene to 2-hexanone	iii) Heck reaction
	iv) Olefin Metathesis

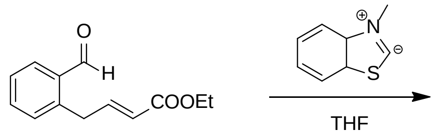
1. A: iv; B: ii; C: iii
2. A: ii; B: iv; C: i
3. A: iv; B: iii; C: i
4. A: i; B: iii; C: iv

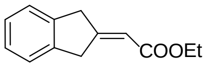
106. Reagents that can be used in the following conversion are

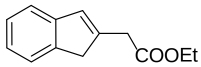


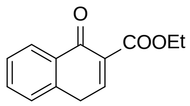
1. i) $Ph_3P{=}CH_2$, ii) HCN, iii) H_3O^+
2. i) $HS(CH_2)_2SH$, ii) n-BuLi, iii) $BrCH_2COOH$
3. i) EtMgI, ii) $KMnO_4$
4. i) Ph_3P, CBr_4, ii) n-BuLi, iii) CO_2

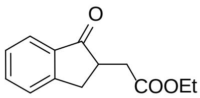
107. In the following reaction, the structure of the major product is



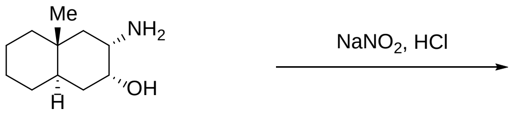
1˙ 

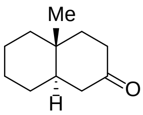
2˙ 

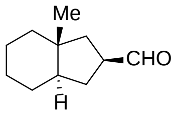
3˙ 

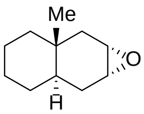
4˙ 

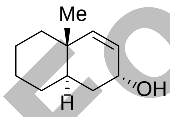
108. The following reaction, the structure of the major product is



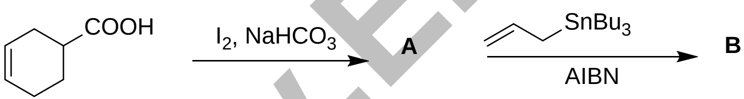
1 

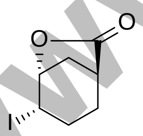
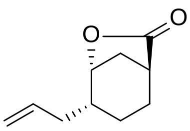
2 

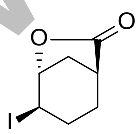
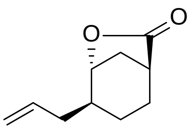
3 

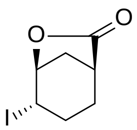
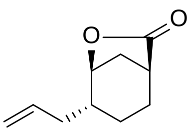
4 

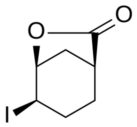
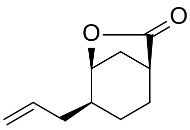
109. Identify the products **A** and **B** in the following reaction sequence.



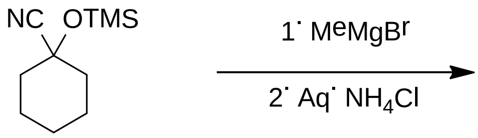
1. **A** is  **B** is 

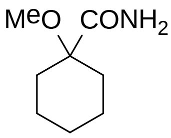
2. **A** is  **B** is 

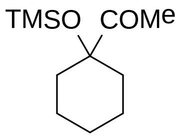
3. **A** is  **B** is 

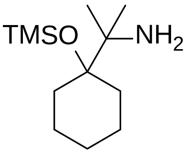
4. **A** is  **B** is 

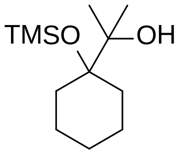
110. Major product formed in the following reaction is



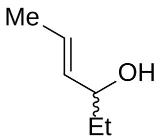
1 

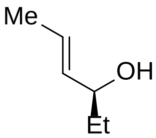
2 

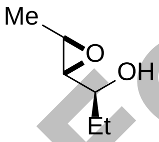
3 

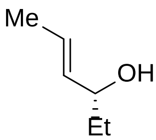
4 

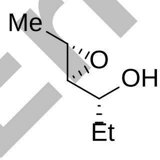
111. Product of Sharpless kinetic resolution of the following alcohol with (–)-diethyl tartrate is



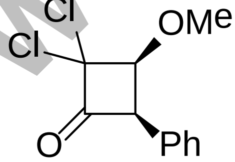
1. 

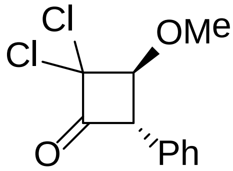
2. 

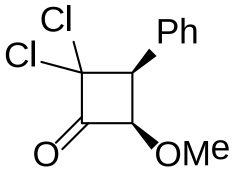
3. 

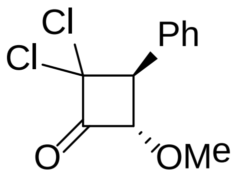
4. 

112. Select the product of the reaction of (Z)-(2-methoxyvinyl) benzene with dichloroacetylo chloride in presence of triethyl amine.

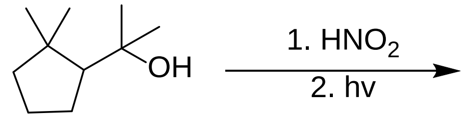
1˙ 

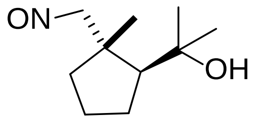
2˙ 

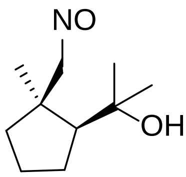
3˙ 

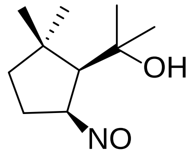
4˙ 

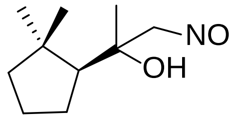
113. Identify the product formed in the following reaction



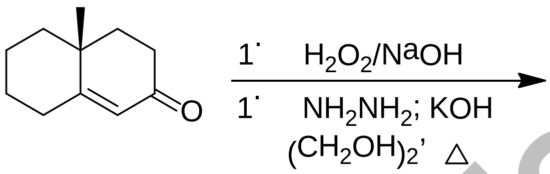
1. 

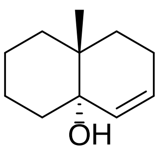
2. 

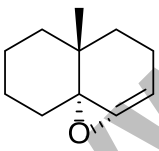
3. 

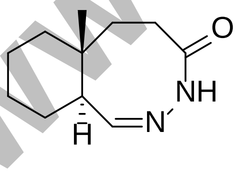
4. 

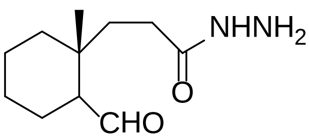
114. The compound formed in the following reaction sequence is



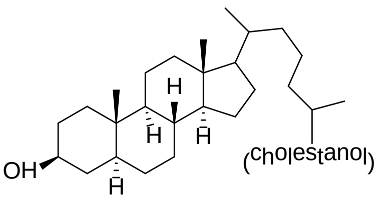
1. 

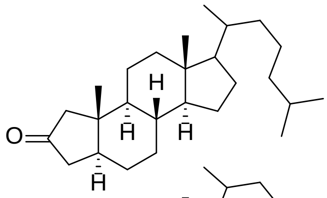
2. 

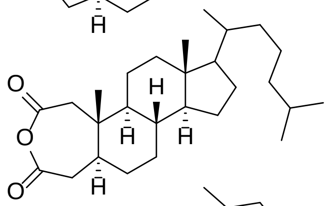
3. 

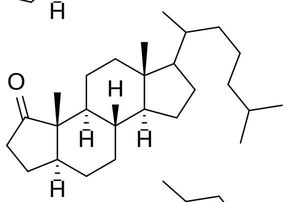
4. 

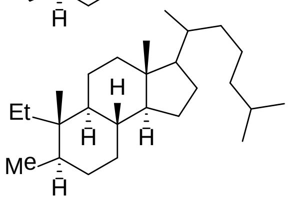
115. Cholestanol on oxidation with chromium trioxide in acetic acid/pyridine gives a dicarboxylic acid, which on pyrolysis in the presence of a catalytic amount of barium hydroxide gives compound **A** as the major product. The structure of **A** is



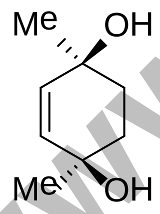
1. 

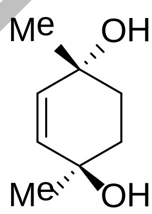
2. 

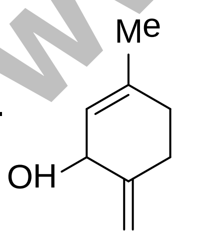
3. 

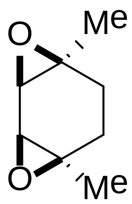
4. 

116. Photolysis of 1, 4-dimethyl-1, 3-cyclohexadiene in presence of excess oxygen and catalytic amount of Rose Bengal followed by reduction with H_2/Pt provides

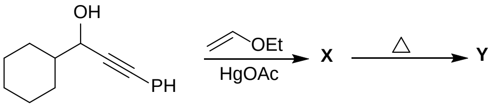
1. 

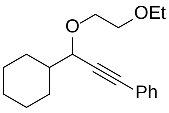
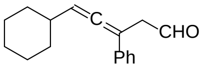
2. 

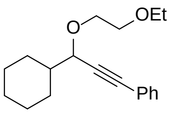
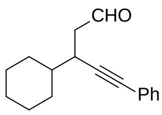
3. 

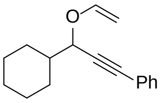
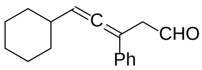
4. 

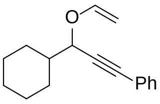
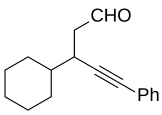
117. In the following reaction sequence, the correct structures of the major products **X** and **Y** are



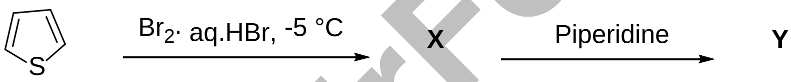
1. **X** is  and **Y** is 

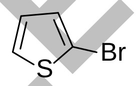
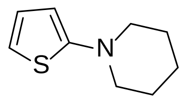
2. **X** is  and **Y** is 

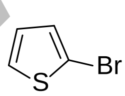
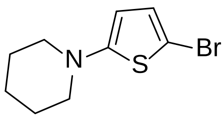
3. **X** is  and **Y** is 

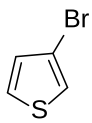
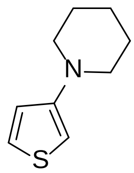
4. **X** is  and **Y** is 

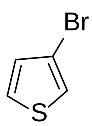
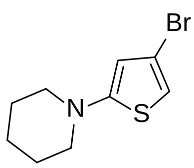
118. Structure of the **X** and **Y**in the reaction sequence of thiophene given below are



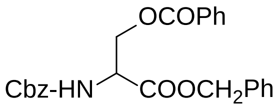
1 **X** is  and **Y** is 

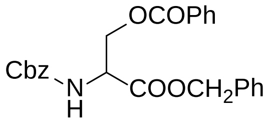
2 **X** is  and **Y** is 

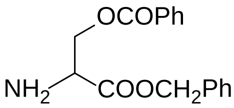
3 **X** is  and **Y** is 

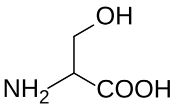
4 **X** is  and **Y** is 

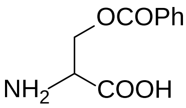
119. Identify the product of hydrogenation (H_2, Pd/C) of the protected amino acid given below



1. 

2. 

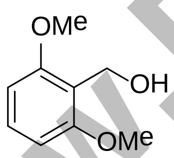
3. 

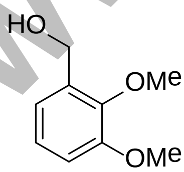
4. 

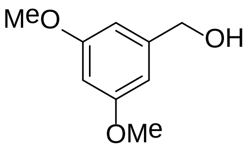
120. In the proton NMR spectrum, an organic compound exhibited the following spectral data

δ 7.2 (1H, dd, J=8and 1.5 Hz), 6.8 (1H, d,J =1.5 Hz), 6.7 (1H, d, J=8Hz), 4.9 (2H, s), 3.9 (3H, s), 3.85 (3H, s), 3.5 (1H, br s, exchangeable with D_2O)

The compound among the choices given below is

1 

2 

3 

4