Target IIT-JAM-2017

Test Series-2

ORGANIC CHEMISTRY

[SOLUTIONS]

Booklet Code: B

Duration: 2:00 Hours | **CHEMISTRY-CY** | **Date: 08-01-2017**

Maximum Marks: 100

Read the following instructions carefully:

1 Attempt all the questions.

2. **Section-A** contains **30** Multiple Choice Questions (MCQ). Each question has 4 choices (a), (b), (c) and (d), for its answer, out of which **ONLY ONE** is correct. From **Q.1 to Q.10** carries 1 Marks and **Q.11 to Q.3**0 carries 2 Marks each.

3. **Section-B** contains **10** Multiple Select Questions(MSQ). Each question has 4 choices (a), (b), (c) and (d) for its answer, out of which **ONE or MORE than ONE** is/are correct. For each correct answer you will be awarded **2 marks.**

4. Section**-C** contains **20** Numerical Answer Type (NAT) questions. From **Q.41 to Q.50** carries **1 Mark** each and **Q.51 to Q.60** carries **2 Marks** each. For each NAT type question, the value of answer in between 0 to 9.

5. In all sections, questions not attempted will result in zero mark. In Section–A (MCQ), wrong answer will result in negative marks. For all **1 mark** questions, **1/3 marks** will be deducted for each wrong answer. For all **2 marks** questions, **2/3 marks** will be deducted for each wrong answer. In Section–B (MSQ),there is no negative and no partial marking provision. There is no negative marking in Section –C (NAT) as well.

Regn. No. | | | | | | | | | | |

Name of Student .....Batch.....

College/University .....

CAREER ENDEAVOUR
Best Institute for IIT-JAM, NET & GATE

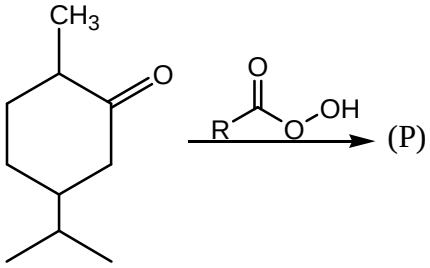
G.T.B. NAGAR
33-35, Mall Road, G.T.B. Nagar (Opp. Metro Gate No.3), Delhi-09
T : 011-65462244, 65662255

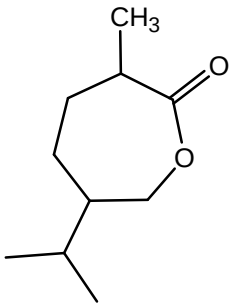
JIA SARAI
28-A/11, Jia Sarai, Near-IIT Hauz Khas, New Delhi-16
T : 011-26851008, 26861009
E: info@careerendeavour.in, W : www . careerendeavour.in

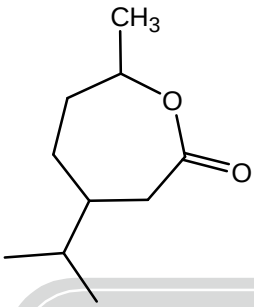
Section-A : Multiple Choice Questions (MCQ)

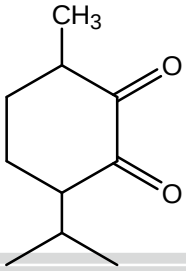
Q.1 to Q.10: Carry 1 Mark each.

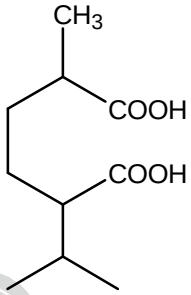
1. The major product (P) formed will be



(a) 

(b) 

(c) 

(d) 

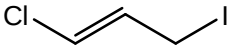
Soln. It is an example of Baeyer villiger oxidation and 2º alkyl group has more migrating aptitude as compare to 1º alkyl group.
Correct option is (b)

2. Which of the following is most reactive as a nucleophile

(a) PhO^- (b) PhS^- (c) $Ph-CH_2-O^-$ (d) $Ph-CH_2-\ddot{N}H_2$

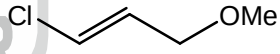
Soln. Basicity and Nucleophilicity move anti-parallel in a group from up to down.
Correct option is (b).

3. Which compound is the major product of the following reaction

(a) 

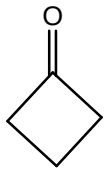
(b) 

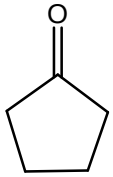
(c)

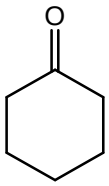
(d) 

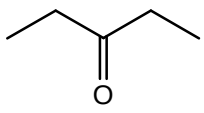
Soln. This reaction with a powerfull nucleophile I^-, will be by the S_N2 mechanism. In substrate, an allylic chloride and a vinylic chloride, allylic system are very reactive by the S_N2 mechanism and vinylic systems are unreactive.
Correct option is (a).

4. Which ketone has the largest equilibrium constant for hydration

(a) 

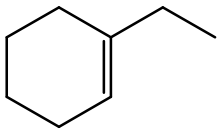
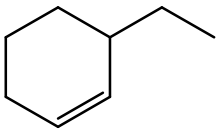
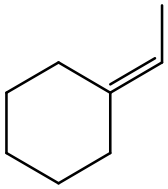
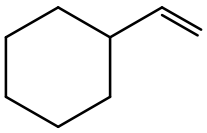
(b) 

(c) 

(d) 

Soln. The carbonyl carbon charges from sp^2 to sp^3 hybridisation in the conversion of a ketone of its hydrate, so there is a relief of ring strain upon the hydration of cyclobutanone.
Correct option is (a).

5. Decreasing order of heat of hydrogenation in the following Alkenes.

(1)  (2)  (3)  (4) 

(a) 1 > 2 > 3 > 4 (b) 4 > 3 > 2 > 1 (c) 4 > 2 > 1 > 3 (d) 2 > 3 > 4 > 1

Soln. Heat of hydrogenation $\propto \frac{1}{\alpha\text{-hydrogen}}$

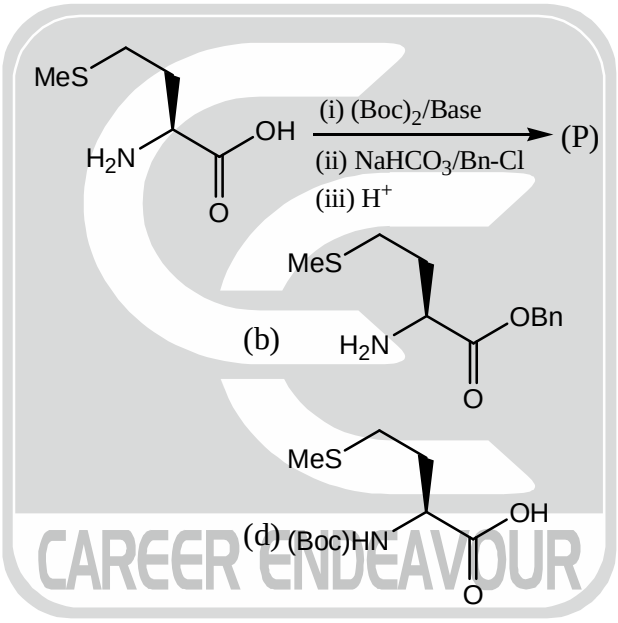
Correct option is (c)

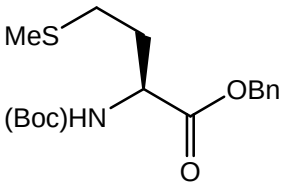
6. The incorrect statement(s) about the furan is/are
(a) Furan gives electrophilic substitution reaction faster than benzene
(b) Furan is less aromatic then benzene
(c) Furan gives poly bromination with Br_2 in non-alcoholic solvents.
(d) Furan does not gives Diels-Alder reaction

Soln. Furan gives Diels-Alder reaction, act as Diene.

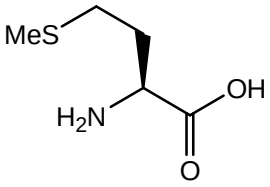
Correct option is (d)

7. The major product (P) is

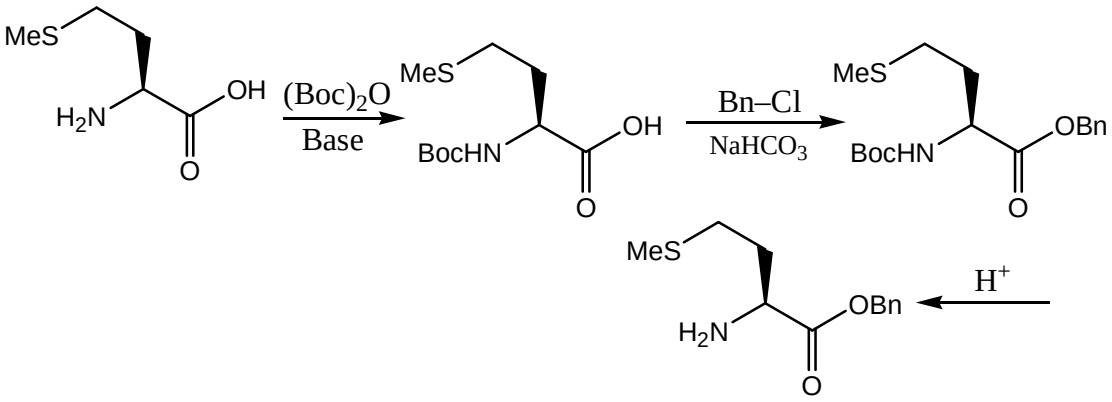


(a) 

(b)

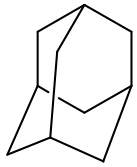
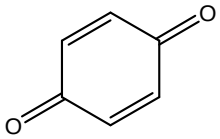
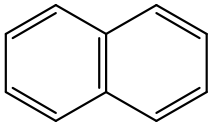
(c) 

(d)

Soln. 

Correct option is (b)

8. How many signals would you expect in the ^{13}C NMR of the following compounds , respectively

(A)  (B)  (C) 

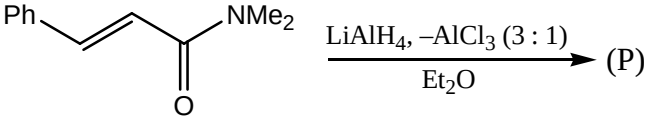
(a) 3, 2, 3 (b) 2, 2, 3 (c) 3, 4, 2 (d) 2, 4, 3

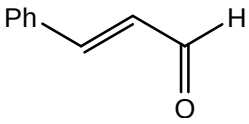
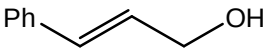
Soln. ^{13}C NMR in

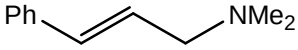
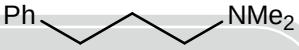
A = 2 signal
B = 2 signal
C = 3 signal

Correct option is (b)

9. The major product formed in the following reaction



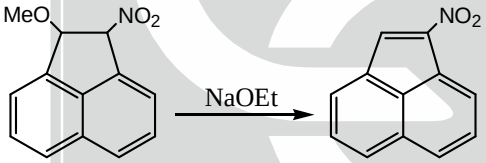
(a)  (b) 

(c)  (d) 

Soln. Reduction with lithium aluminium hydride-aluminium chloride (3 : 1) provide a good route from α, β unsaturated carbonyl compounds to unsaturated amines.

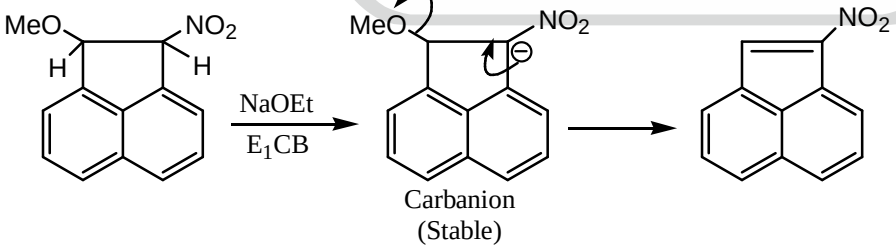
Correct option is (c).

10. The reaction given below is an example of



(a) E_2-elimination (b) E_1-elimination
(c) syn-elimination (d) E_1CB-elimination

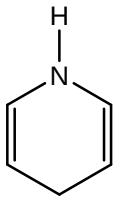
Soln. Chemical reaction involved in the above transformation can be illustrated as

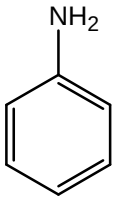


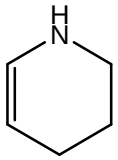
Correct answer: (d)

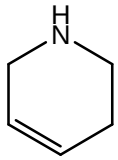
Q.11 to Q.30: Carry 2 Marks each.

11. Order of basicity in following compound will be

(1) 

(2) 

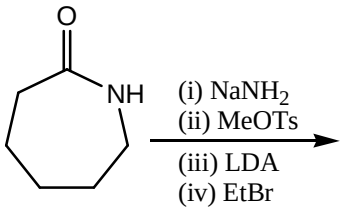
(3) 

(4) 

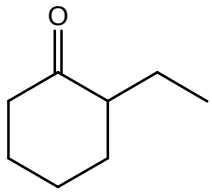
(a) 1 > 2 > 3 > 4 (b) 4 > 3 > 2 > 1 (c) 4 > 3 > 1 > 2 (d) 2 > 1 > 4 > 3

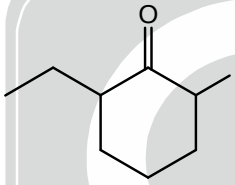
Soln. If the lonepair of N involves in resonase than basicity of N is decrease. Hence, in the compound (4) lone pair of nitrogen atom does not involve in the resonance, so most basic in nature.

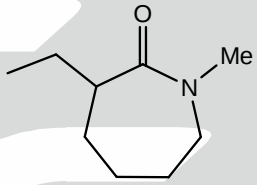
Correct option is (c)

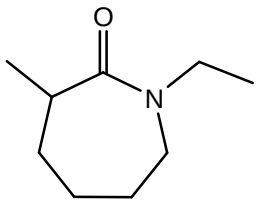
12. 

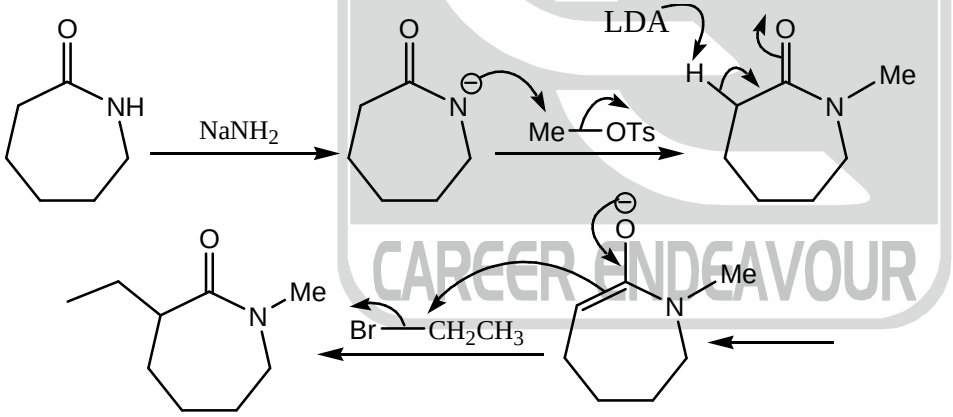
Product will be ?

(a) 

(b) 

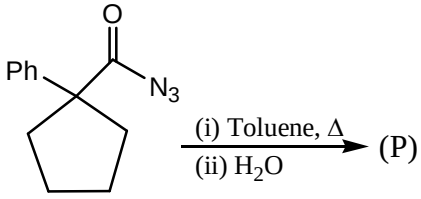
(c) 

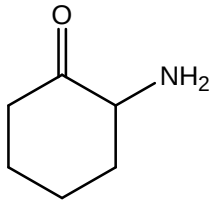
(d) 

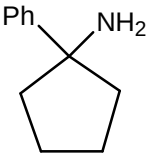
Soln. 

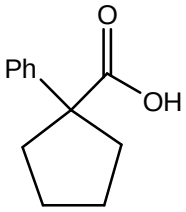
Correct option is (c)

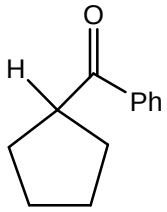
13. Which is the major product of the following reaction of an acyl azide?

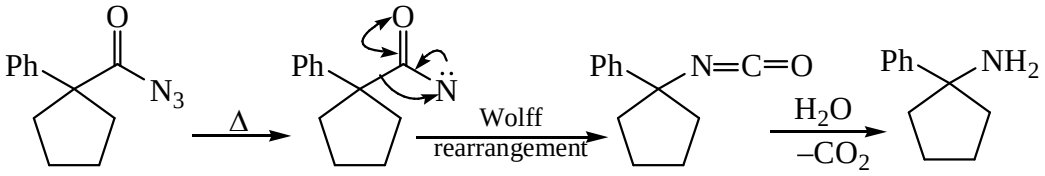


(a) 

(b) 

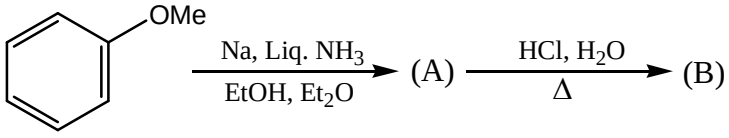
(c) 

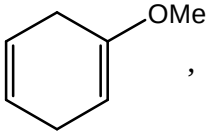
(d) 

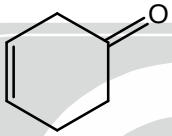
Soln. 

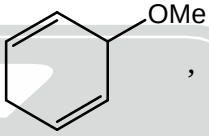
Correct option is (b).

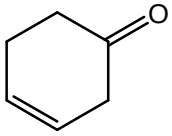
14. Which combination of compounds in a-d identifies A and B in the following reaction

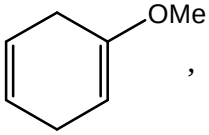


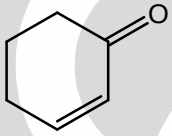
(a) A = 

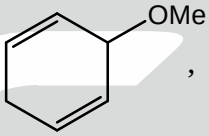
, B = 

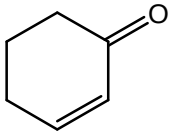
(b) A = 

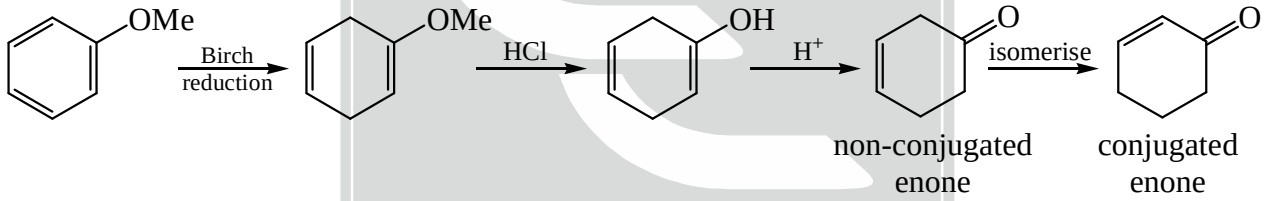
, B = 

(c) A = 

, B = 

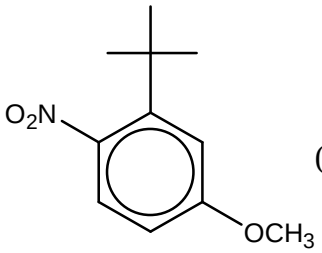
(d) A = 

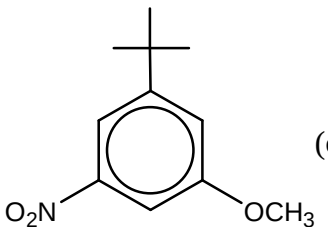
, B = 

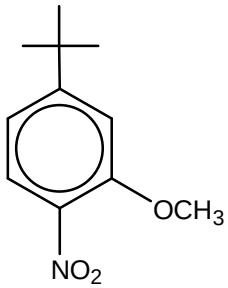
Soln. 

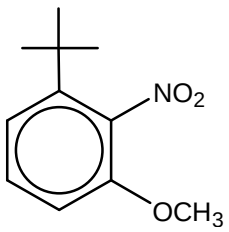
Correct option is (c).

15. Which is obtained as the main product upon reaction of m–t-butylanisole (1-t-butyl-3-methoxybenzene) with conc. ($HNO_3 + H_2SO_4$)

(a) 

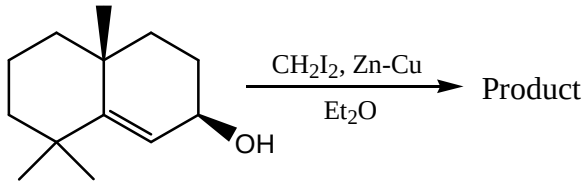
(b) 

(c) 

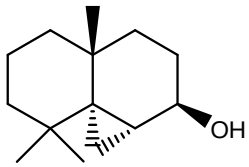
(d) 

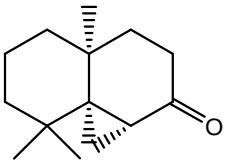
Soln. In between t-butyl group and methoxy group, OCH_3 is strong activating group and $–NO_2$ group occupy to its ortho position.

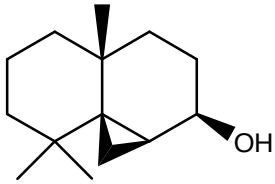
Correct option is (c)

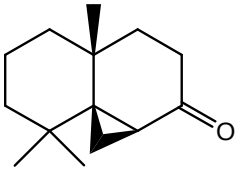
16. 

The major product formed will be

(a) 

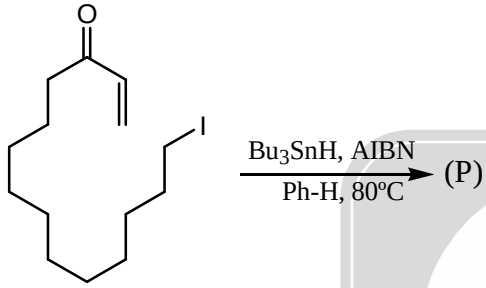
(b) 

(c) 

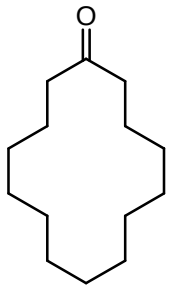
(d) 

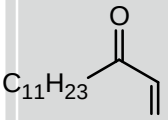
Soln. Since –OH is polar group. So, Simmons smith reagent will attack from the same side of –OH group due chelation between O and Zn metal.

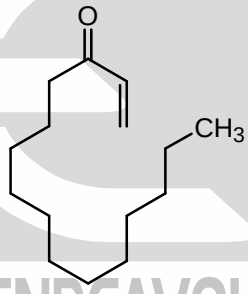
Correct option is (c)

17. 

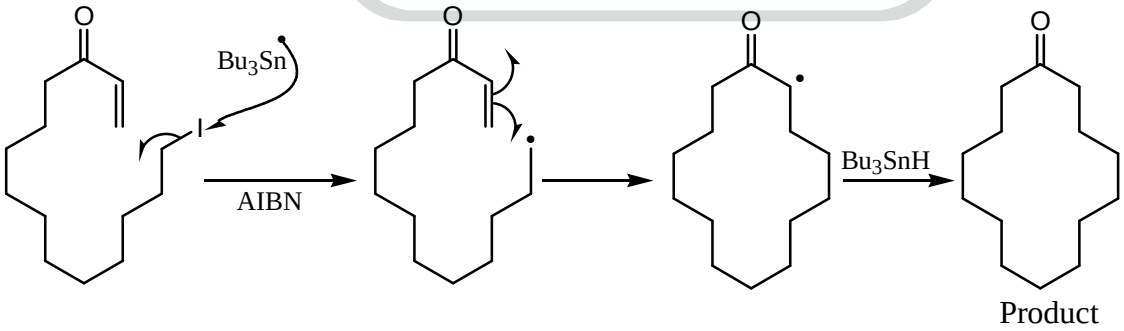
The major product formed in the above reaction is

(a) 

(b) 

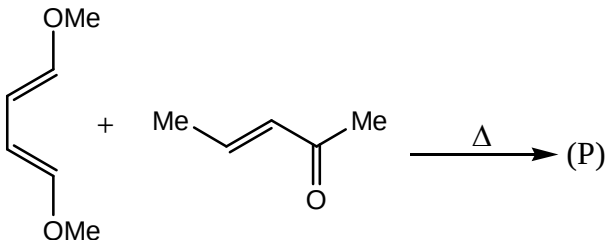
(c) 

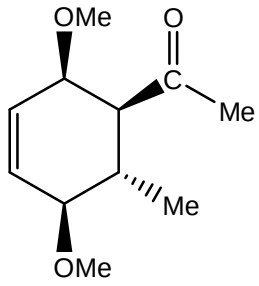
(d) none of these

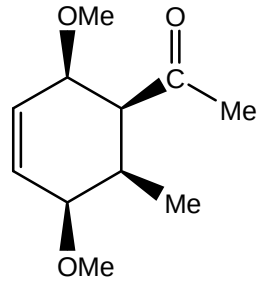
Soln. 

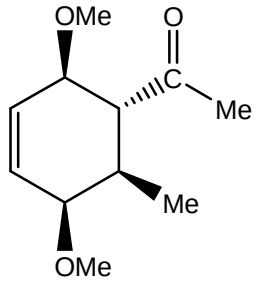
Correct option is (a)

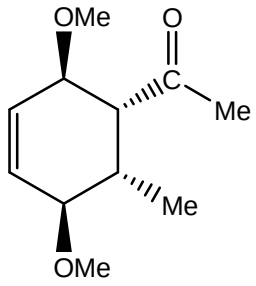
18. The major product (P) is

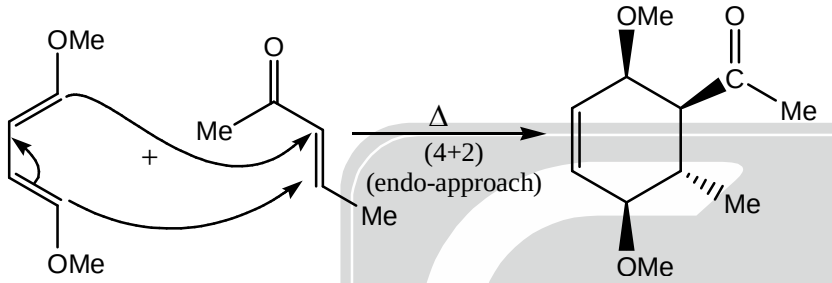


(a) 

(b) 

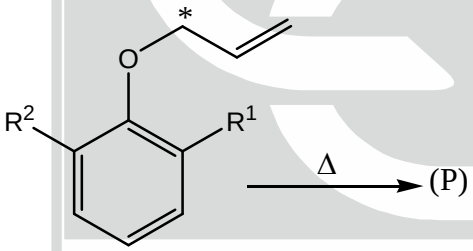
(c) 

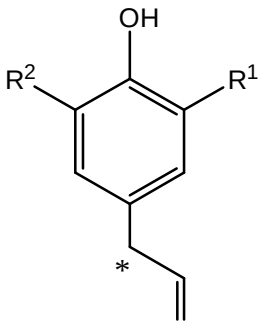
(d) 

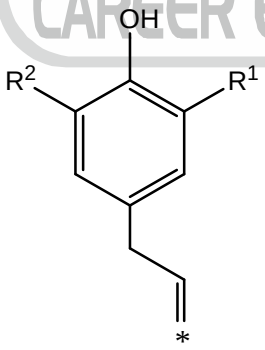
Soln. 

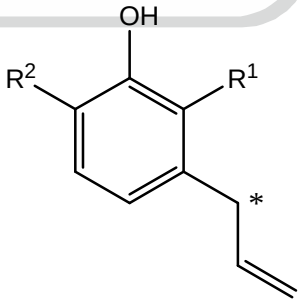
Correct option is (a)

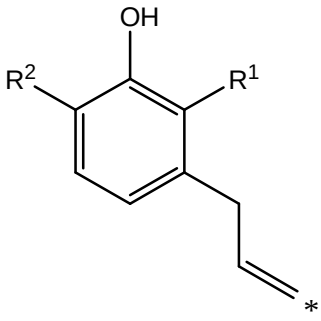
19. The product (P) is



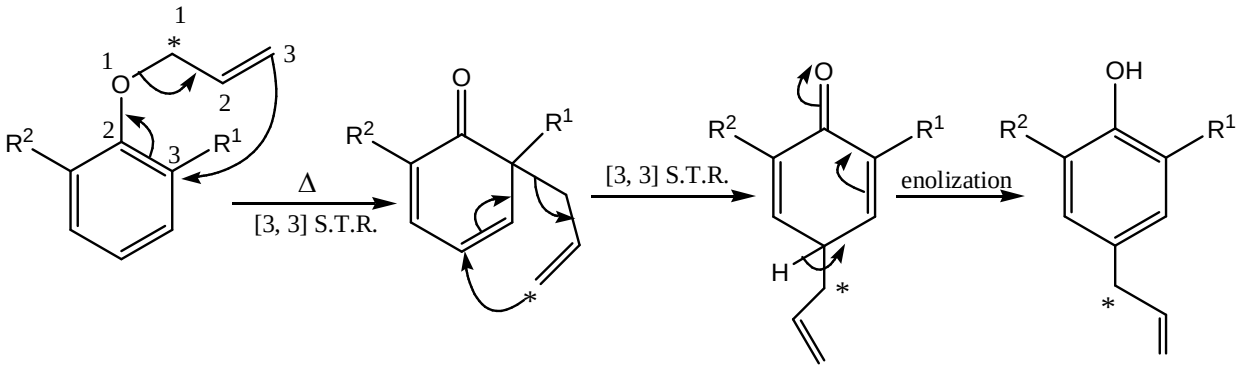
(a) 

(b) 

(c) 

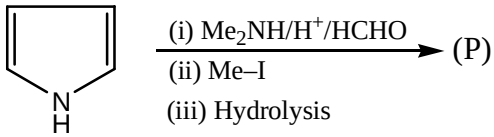
(d) 

Soln.

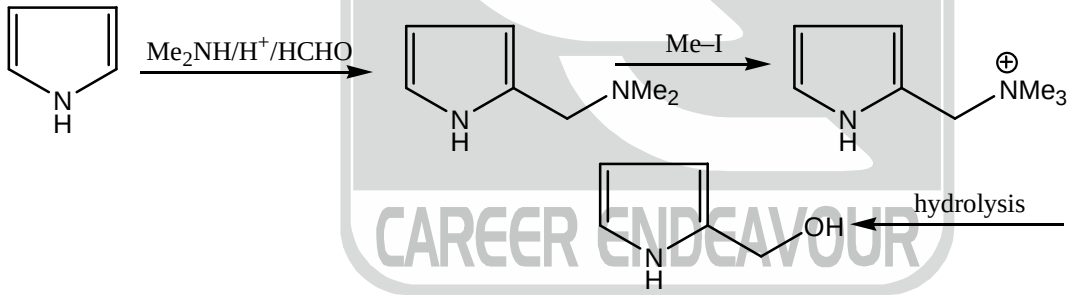


Correct option is (a)

20. The product (P) is

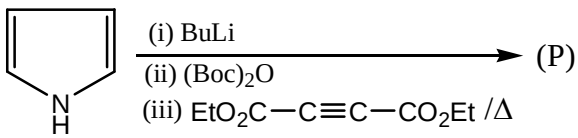


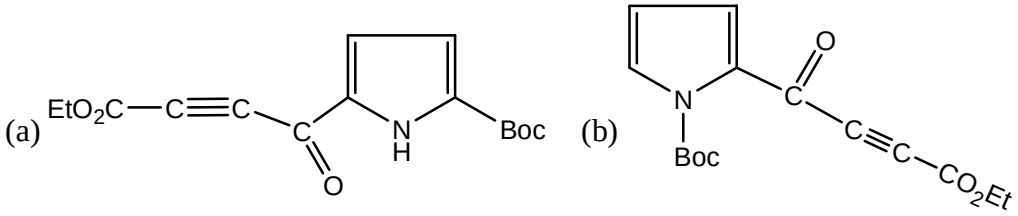
Soln.

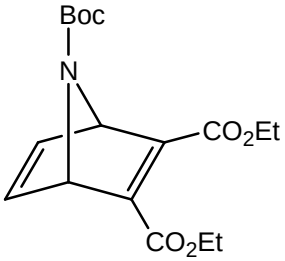


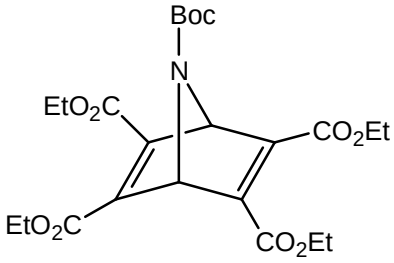
Correct option is (c)

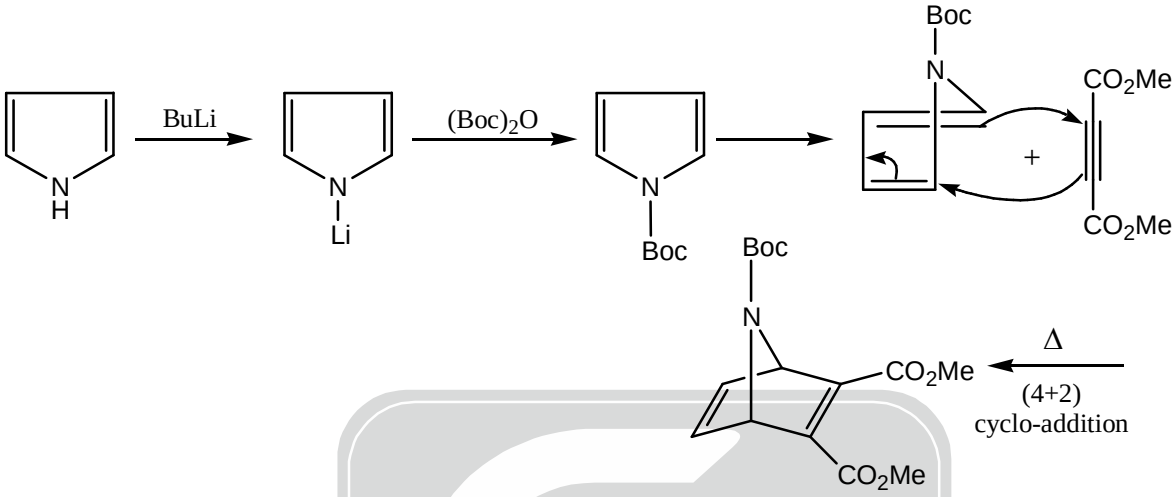
21. The product (P) is





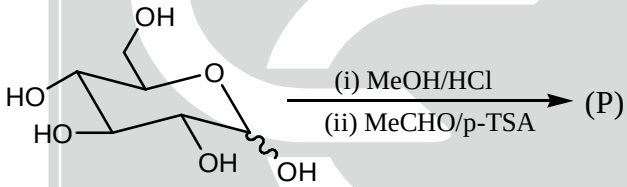
(c) 

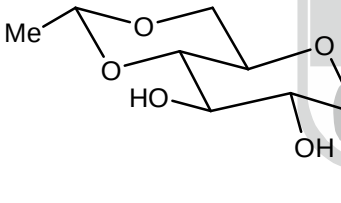
(d) 

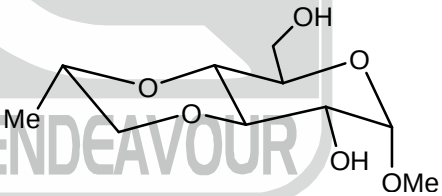
Soln. 

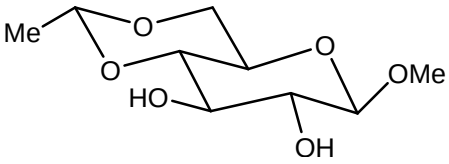
Correct option is (c)

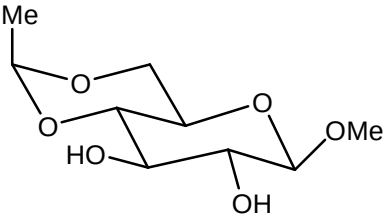
22. The product (P) is

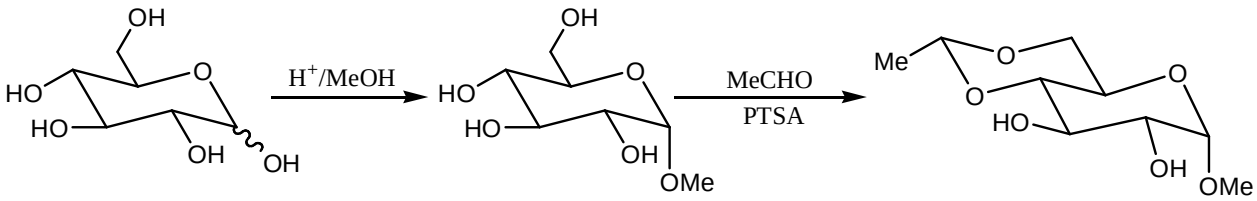


(a) 

(b) 

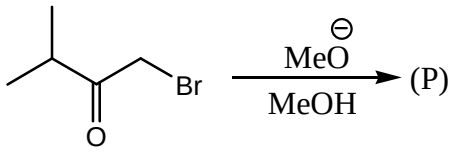
(c) 

(d) 

Soln. 

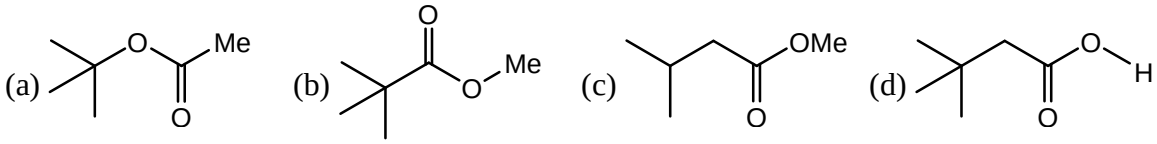
Correct option is (a)

23. Suggests structure for the products of these reactions, interpreting the spectroscopic data

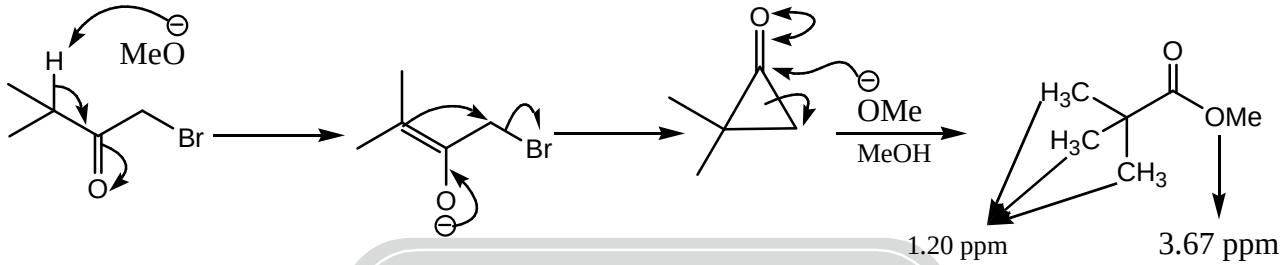


Molecular formula : $C_6H_{12}O_2$

$\nu_{max}\left(cm^{-1}\right)$ 1745; δ_C (ppm) :179, 52, 39, 27; δ_H (ppm), 1.20(9H, s), 3.67(3H, s)

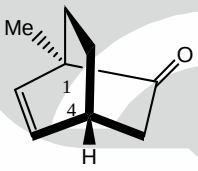


Soln.



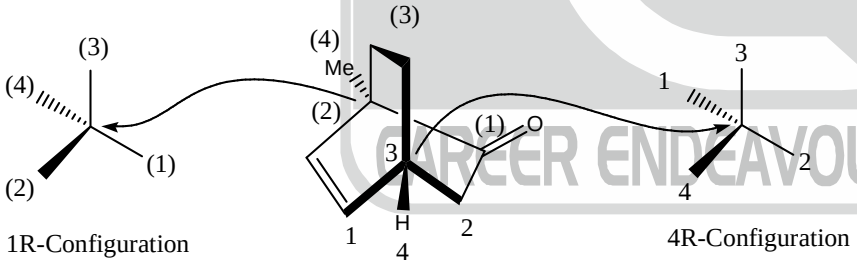
Correct option is (b)

24. The configuration at the two stereocentres in the compound given below are



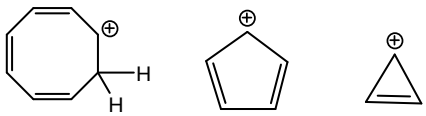
(a) 1R, 4R (b) 1R, 4S (c) 1S, 4R (d) 1S, 4S

Soln.



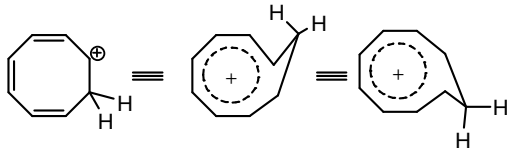
Correct answer: (a)

25. Among the carbocations given below



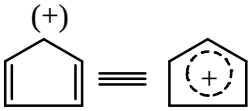
(a) A is homoaromatic, B is antiaromatic and C is aromatic.
(b) A is aromatic, B is antiaromatic and C is homoaromatic.
(c) A is antiaromatic, B is aromatic and C is harmoaromatic.
(d) A is homoaromatic, B is aromatic and C is antiaromatic.

Soln.

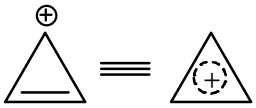


(A) Homoaromatic character

(Aromatised by bypassing the sp^3-carbon atom)

(B) 

- Delocalisation
- sp^2- carbons (planar)
- 4n = 4 (π- electron)
  n = 1
- Antiaromatic character.

(C) 

- Delocalisation
- (4n+2) = 2 (π-electron)
  n = 0
- Aromatic character.

Correct answer: (a)

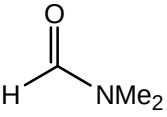
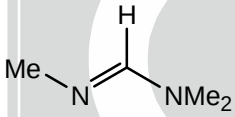
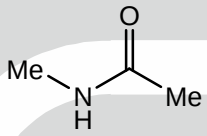
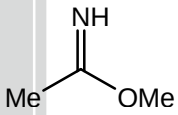
26. The order of carbonyl stretching frequency in the IR spectra of ketone, amide and anhydride is:
(a) Anhydride > amide > ketone (b) Ketone > amide > anhydride
(c) Amide > anhydride > ketone (d) Anhydride > ketone > amide

Soln. Because υ_{C-O} of anhydride = 1800 –1900 cm^{-1}.

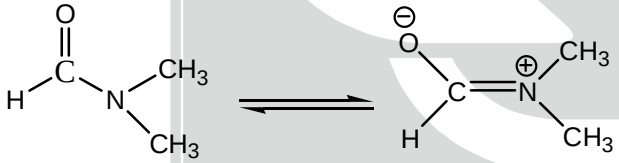
υ_{C-O} of ketone = 1720 cm^{-1}. υ_{C-O} of amide = 1600–1700 cm^{-1}.

Correct answer: (d)

27. In the ^1H NMR spectrum recorded at 293 K, an organic compound (C_3H_7NO), exhibited signals at δ 7.8 (1H, s), 2.8 (3H, s) and 2.6 (3H, s). The compound is

(a)  (b)  (c)  (d) 

Soln. DMF appears in two forms as shown below



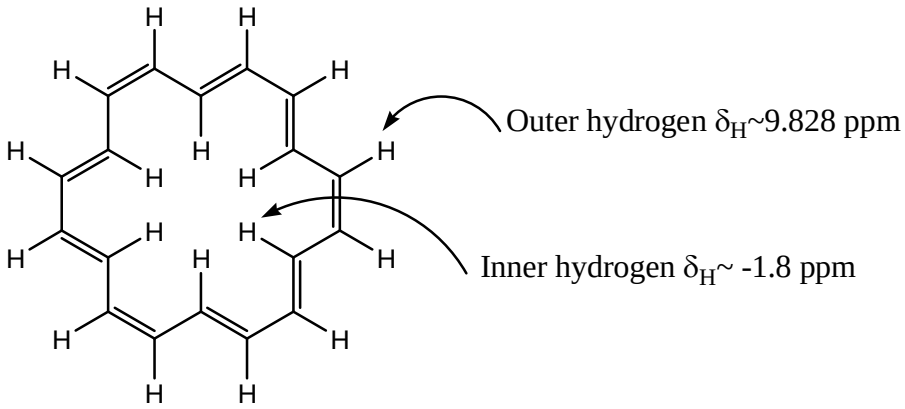
Form-1 at higher temperature Form-2 at 293 K

At lower temperature DMF remains in form-2 preferentially
In form-2 methyl groups are chemically non-equivalent and they appears as singlets at 2.8 and 2.6 ppm.
Singlet at 7.8 ppm appears due to olefinic proton of form-2.
Correct answer is (a)

28. Consider the following statements for [18]-annulene
(A) It is aromatic
(B) The inner protons resonate at δ 9.28 in its ^1H NMR spectrum
(C) There are six protons in the shielded zone.
(a) A, B, C (b) A and B only (c) B and C only (d) A and C only

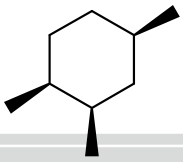
Soln. [18] annulene is aromatic compound and shows ring current
- The ring current produces strong induced magnetic field.
- Outer 12 protons appears at 8.9 ppm because they remains in deshielding zone.

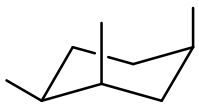
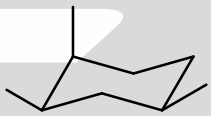
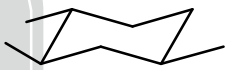
Inner six protons appears at – 1.8 ppm because they remains in shielding zone (up-field)
Hence, statement A and C are correct.



Correct answer is (d).

29. Among the structures given below, the most stable conformation for the following compound is



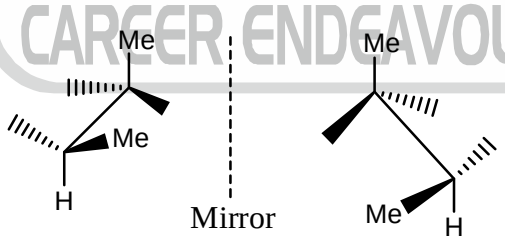
(a)  (b)  (c)  (d) 

Soln. In conformation, all methyl group in same direction. A and C having all group in same side. But in case (A) 1-3, diaxial interaction occur. So, (C) is more stable as compare to (A).
Correct option is (c).

30. The gauche conformation $(\varphi = 60^{\circ})$ of n-butane posseses

(a) plane of symmmetry; and is achiral (b) C_2-axis of symmetry; and is chiral
(c) centre of symmetry; and is achiral (d) plane of symmetry; and is chiral

Soln. The Gauche conformations of n-Butane are non-superimposable mirror image of each other, thus Gauche conformation is chiral.



If contains neither plane nor centre of symmetry.

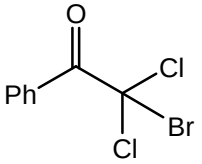
A C_2 axis passes through the mid-point of C_2–C_3 bond and bisecting the dihedral angle between the two methyls.

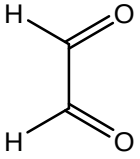
Correct answer is (b).

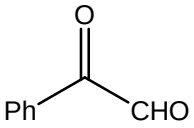
Section-B : Multiple Select Questions (MSQ)

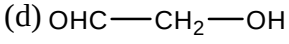
Q.31 to Q.40: Carry 2 Marks each.

31. Select the compounds undergoing inter or intra molecular Cannizaro reaction

(a) 

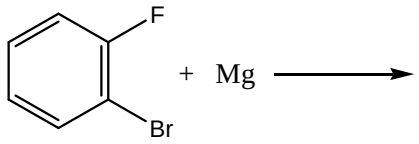
(b) 

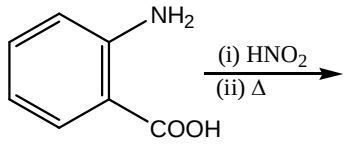
(c) 

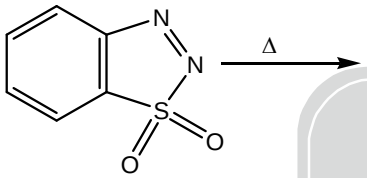
(d) 

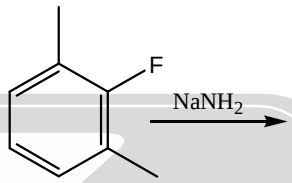
Soln. Compound in which α-hydrogen atoms are absent, give Cannizaro reaction.
Correct options are (a), (b) and (c)

32. In which reactions benzyne will be formed as intermediate

(a) 

(b) 

(c) 

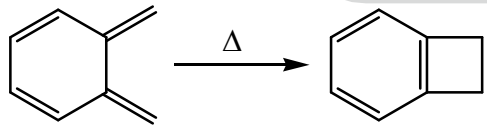
(d) 

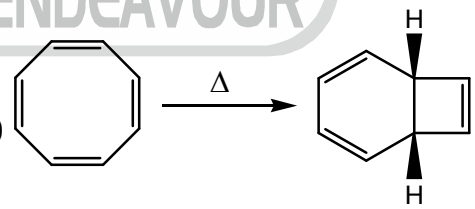
Soln. In structure, (a), (b) and (c) formed Benzyne intermediate.
Correct options are (a), (b) and (c).

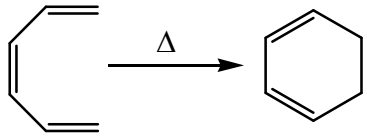
33. The incorrect statement(s) about the heterocyclic compounds is/are
(a) Pyrrole gives electrophilic substitution reaction while as pyridine give nucleophilic substitution reactions
(b) Pyrrole does not act as base while as pyridine does.
(c) Furan and thiophine gives electrophilic substitution reactions with equal rate
(d) Pyrrole gives nucleophilic addition reaction with Grignard reagent.

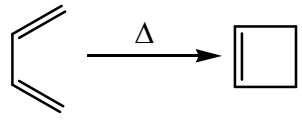
Soln. 3rd and 4th statement are incorrect.
Correct option (c) and (d).

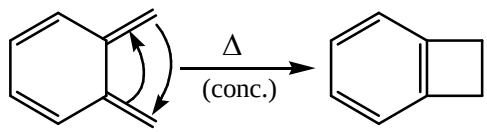
34. In which the product is formed through dis-rotation

(a) 

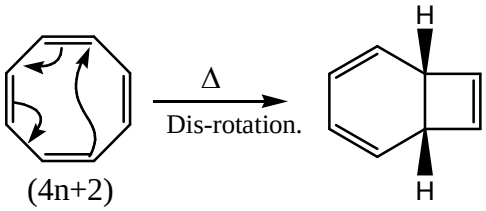
(b) 

(c) 

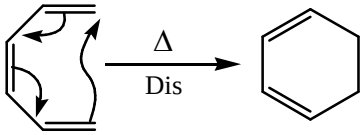
(d) 

Soln. (a) 

(4n)

(b) 

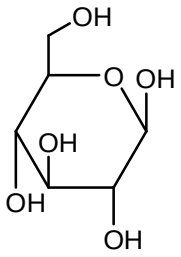
(4n+2)

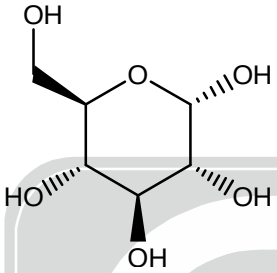
(c) 

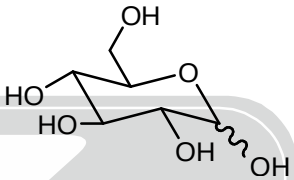
(4n+2)

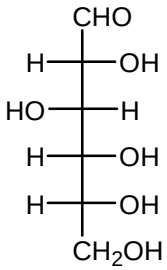
Correct option is (b) and (c)

35. The correct structure of the D-glucose is/are

(a) 

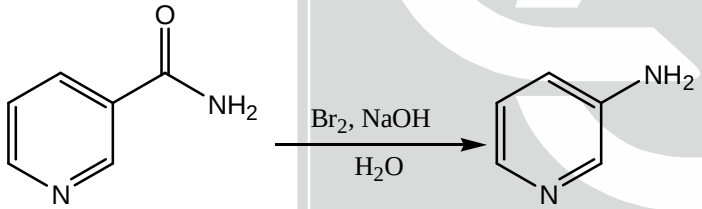
(b) 

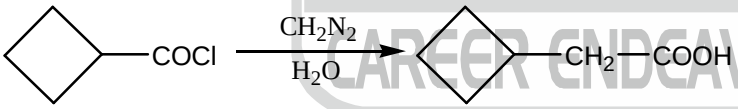
(c) 

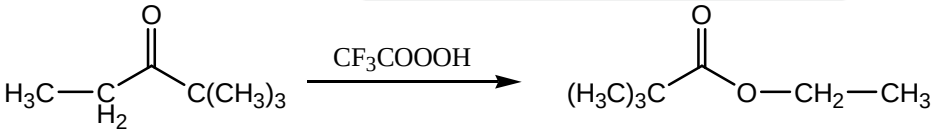
(d) 

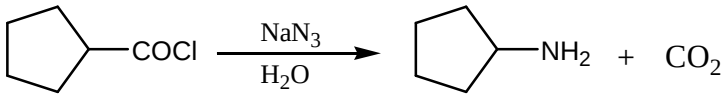
Soln. All forms are the correct structures of D-glucose.
Correct option is (a), (b), (c) and (d)

36. Which of the following equation shown as correct product

(a) 

(b) 

(c) 

(d) 

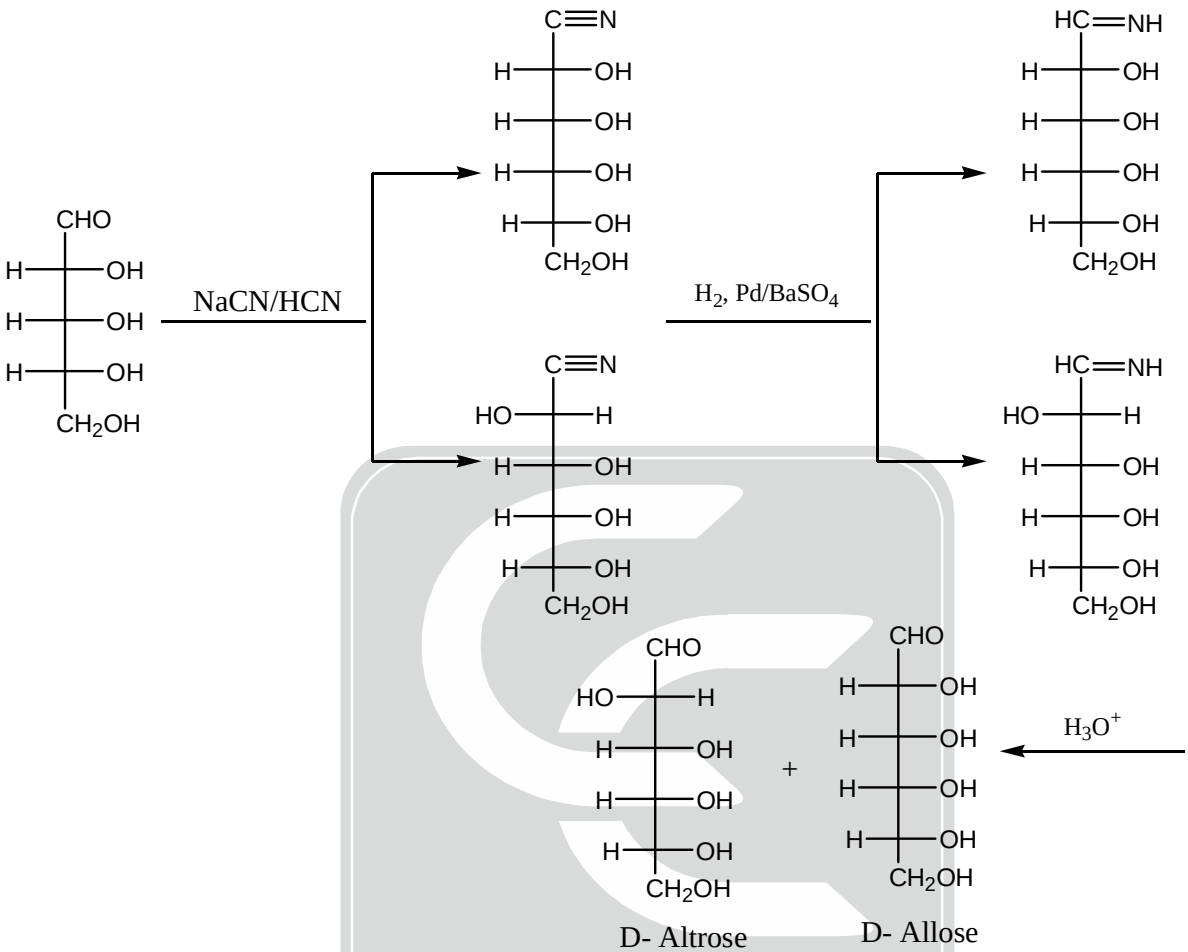
Soln. The reaction include (a) Hoffmann rearrangement, (b) a wolff rearrangement, (d) curtius rearrangement. Reaction (c) is possible Baeyer-villiger oxidation, but t-butyl has a higher migratory aptitude than ethyl to give the alternative ester as the major product.
Correct options are (a), (b) and (d).

37. The products formed in the following reaction is/are

$$\text{D-ribose} \xrightarrow[\text{(ii) } H_2/Pd/BaSO_4]{\text{(i) NaCN/HCN}} \text{(P)}$$
$$\text{(iii) } H_3O^+$$

(a) D-Allose (b) D-Altrose (c) D-Glucose (d) D-Mannose

Soln.



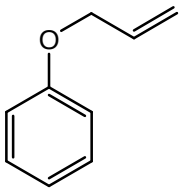
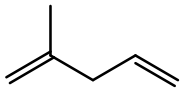
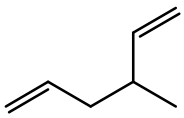
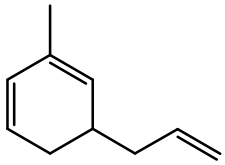
Correct options are (a) and (b)

38. The correct statement(s) about the Diels-Alder reaction is/are
(a) electron donating groups on diene increases, the rate of Diels-Alder reaction
(b) electron donating groups on Dienophile decreases, the rate of Diels-Alder reaction
(c) Anthracene gives Diels-Alder reaction while as benzene does not give
(d) Aromatic character is directly proportional to the reactivity of Diels-Alder reactions

Soln. In presence of electron donating group on the Diene, the energy of HOMO increases while electron withdrawing group on Dienophile decreases the energy of LUMO. Hence, HOMO-LUMO gap decreases and rate of reaction increases.
Antracene gives the Diels-Alder reaction because it is less aromatic.
Statements (1), (2) and (3) are correct.

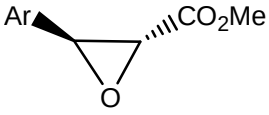
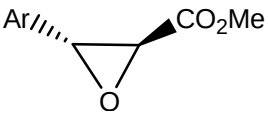
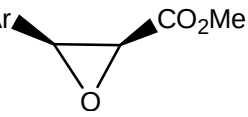
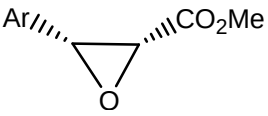
Correct options are (a), (b) and (c).

39. The number of compounds which under goes [3, 3] sigmatropic shift

(a)  (b)  (c)  (d) 

Soln. Compound first, third and fourth undergoes [3, 3] sigmatropic rearrangement and for [3, 3] sigmatropic rearrangement compound should be in 1, 5-hexadiene form.
Correct options are (a), (c) and (d).

40. The correct statement(s) about the given compounds

(A)  (B)  (C)  (D) 

(a) A and B are enantiomers
(b) B and D are diastereomers
(c) B and C are homomers
(d) C and D are enantiomers

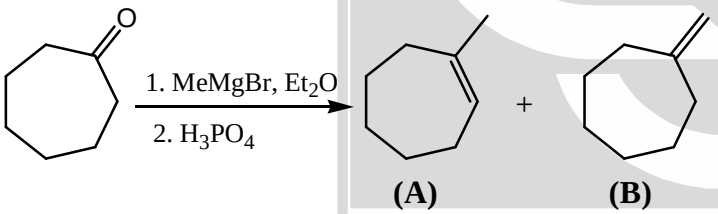
Soln. A and B → Enantiomers

B and D → Diastereoisomers
B and C → Diastereoisomers
C and D → Enantiomers
Correct options are (a), (b) and (d).

Section-C : Numerical Answer Type (NAT)

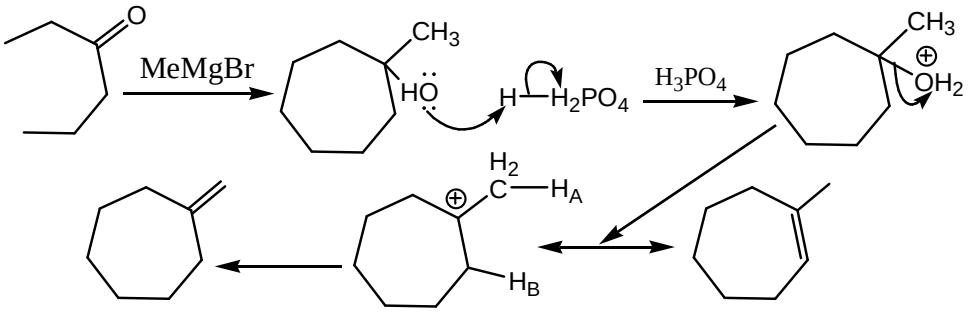
Q.41 to Q.50: Carry 1 Mark each.

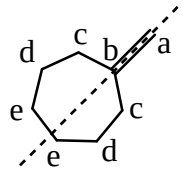
41. Among the following, how many incorrect statement for the following reaction is/are _____



(1) A is the major product and it will have five signals in the proton decoupled ^{13}C NMR spectrum
(2) A is the minor product and it will have eight signals in the proton decoupled ^{13}C NMR spectrum
(3) B is the major product and it will have five signals in the proton decoupled ^{13}C NMR spectrum
(4) B is the minor product and it will have five signals in the proton decoupled ^{13}C NMR spectrum

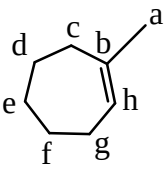
Soln. Chemical reaction involved in the above transformation can be illustrated as





Five distinct carbon atoms, thus five signals in proton decoupled ^{13}C NMR spectrum.

Plane of symmetry



Eight distinct carbon atoms, thus eight signals in proton decoupled NMR spectrum.

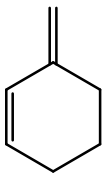
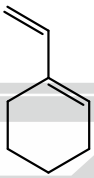
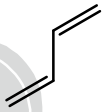
Correct answer is (3)

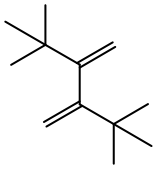
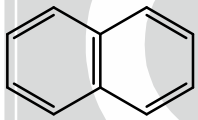
42. Nucleophilic substitution reactions of pyridine occurs at which position _____

Soln. Pyridine is π -sink and gives nucleophilic substitution reaction at second position.

Correct answer is (2)

43. The number of compounds which undergoes Diels-Alder reaction

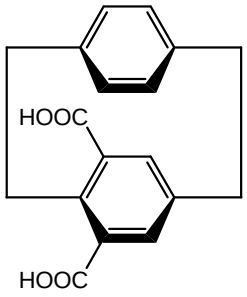
(1) 
(2) 
(3) 
(4) 

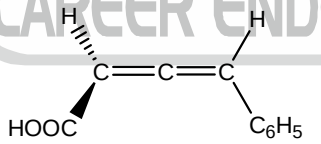
(5) 
(6) 

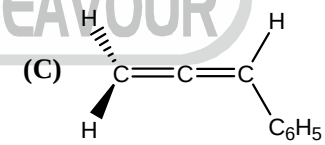
Soln. For Diels-Alder's reaction Diene should be in cisoid form. The nephthelene is highly aromatic, hence does not give the Diels-Alder reaction.

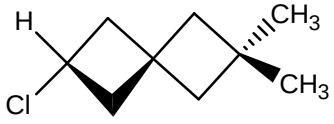
Correct answer is (2)

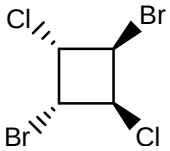
44. How many in the following molecules are chiral

(A) 

(B) 

(C) 

(D) 

(E) 

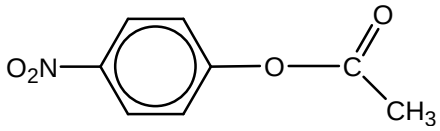
Soln. (a) Achiral, due to the presence of plane of symmetry
(b) Chiral
(c) Achiral, plane of symmetry present
(d) Achiral, Plane of symmetry present
(e) Achiral, due to the presence of centre of symmetry.

Correct answer is (1)

45. In the IR spectrum of p-nitrophenyl acetate, the carbonyl absorption band appears at _____ cm^{-1}

Soln. C = O structure occurs at cm^{-1}.

$1750 - 1735 cm^{-1}$ for aliphatic esters.
$1740 - 1715 cm^{-1}$ if C = O conjugated with aromatic.
$1765 - 1762 cm^{-1}$ if oxygen atom is conjugated with alkene or aromatic.
Example: Phenyl acetate $1765\ cm^{-1}$
p-nitrophenyl acetate $1761\ cm^{-1}$.



Correct answer is (1755 to 1765)

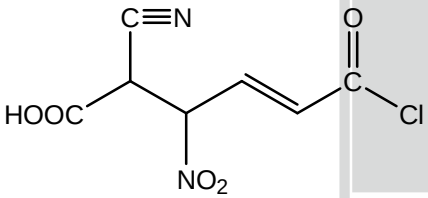
46. Among the following, how many are polar protic solvents?
(i) H_2O (ii) CH_3OH (iii) CH_3CH_2OH (iv) NH_3
(v) Acetone (vi) DMF (vii) Benzene (viii) DMSO (ix) Cyclohexane

Soln. Molecule having polarity with acidic proton known as polarprotic solvent. (Proton attached with more electronegative element containing polar molecule).
H_2O, CH_3OH, CH_3CH_2OH, NH_3 are polar protic solvent.
Correct answer is (4)

47. How many of following rearrangements form isocyanate _____
(1) Wolf rearrangement (2) Hoffmann rearrangement
(3) Beckmann rearrangement (4) Schmidt rearrangement
(5) Lossen rearrangement (6) Curtus rearrangement (7) Claisen rearrangement

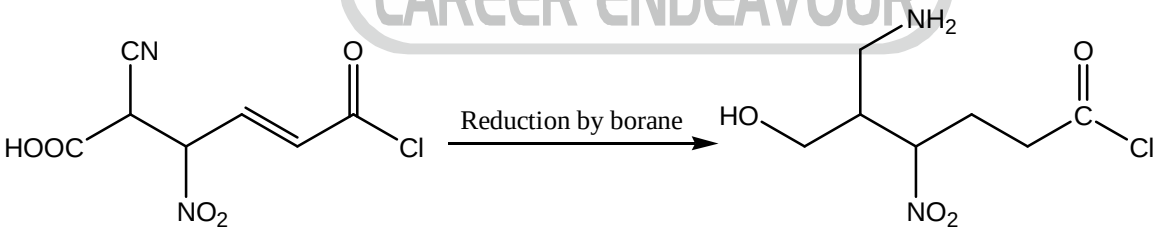
Soln. In the above rearrangements, Curtius, Hoffman, Lossen and Schmidt form isocyanate intermediate.
Correct answer is (4)

48.



In the above structure, how many functional groups not reduce by borane.

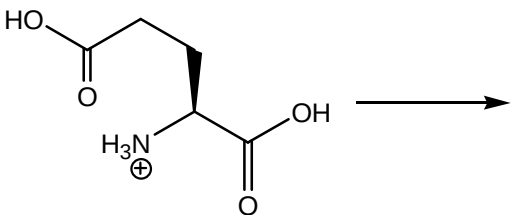
Soln.



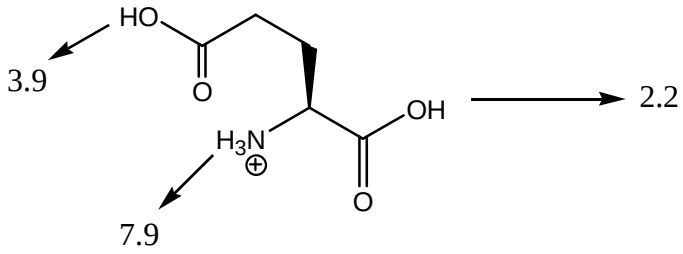
In the above structure, RCOCl and R-NO_2 are not reduce by Borane.

Correct answer is (2)

49. Calculate the pI of the following salt of amino acid having pKa value $x = 2.2$, $y = 3.9$ and $z = 7.9$ respectively.



Soln.



PI of an amino acid having ionizible side chain is the average pK_a values of similarly ionizable groups.

$$\Rightarrow \quad \frac{2.2+3.9}{2}=\frac{6.1}{2}=3.05$$

Correct answer is (3.05)

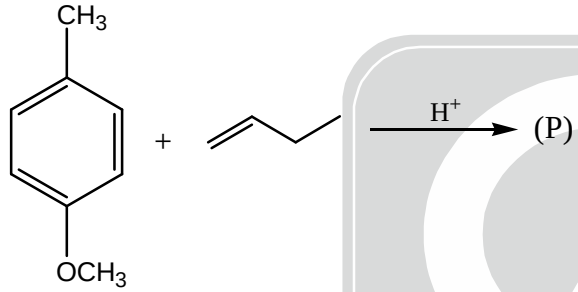
50. How many products will be formed upon the bromination of furan in alcoholic and non-alcoholic solvent.

Soln. Furan upon bromination in alcoholic solvent gives addition product. While as with non-alcoholic solvent gives polybromination products.

Correct answer is (2)

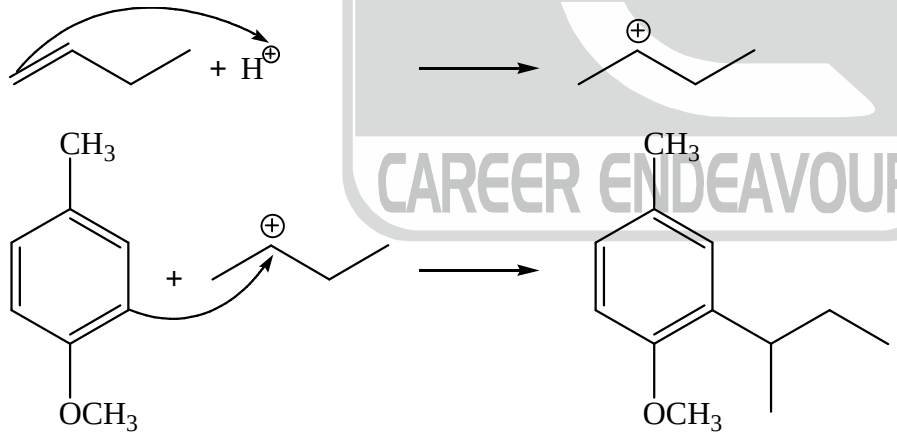
Q.51 to Q.60: Carry 2 Marks each.

51.



How many product will be formed in above reaction.

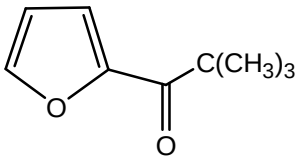
Soln.

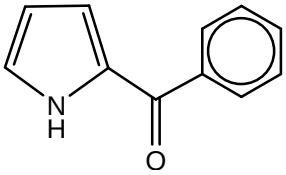


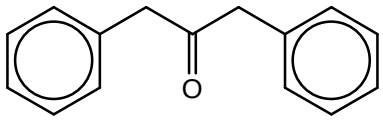
Correct answer is (1)

52. How many compounds gives cannizaro reaction

(1) Cl_3C-CHO (2) $Cl_3C-\overset{\overset{O}{\|}}{C}-CCl_3$ (3) $OHC-CHO$ (4) $Cl_3C-\overset{\overset{O}{\|}}{C}-CH_2-CCl_3$

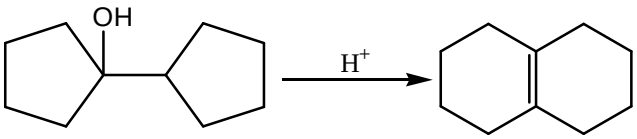
(5) 

(6) 

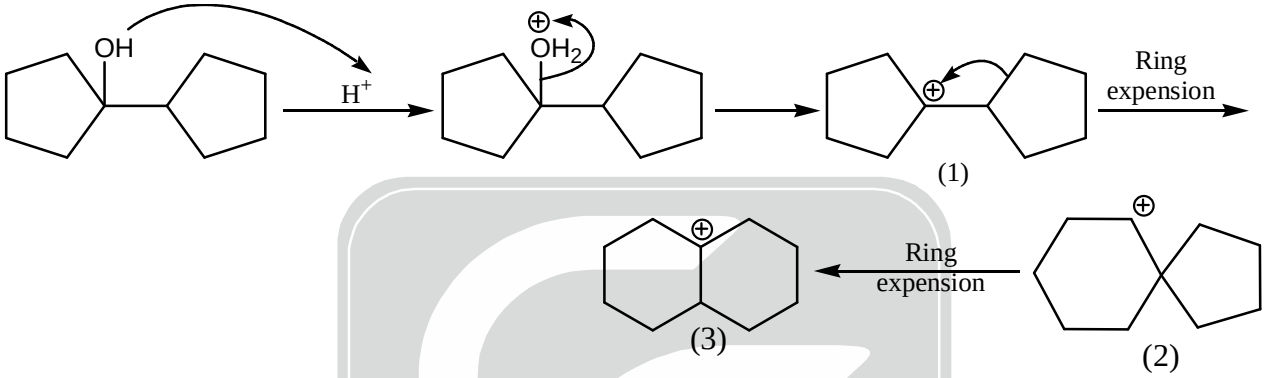
(7) 

Soln. Compounds in which α-hydrogen atoms are absent give cannizaro reaction.
Correct answer is (5)

53. Reaction,

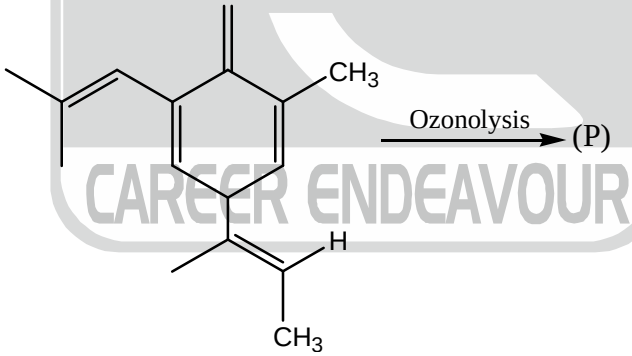


How many intermediate (carbocations) will be form in above conversion.

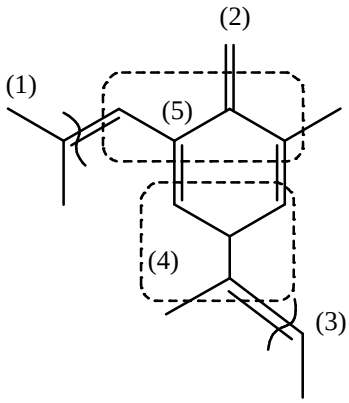
Soln. 

Total carbocation is (3)
Correct answer is (3)

54. How many products will be formed on ozonolysis of following compound

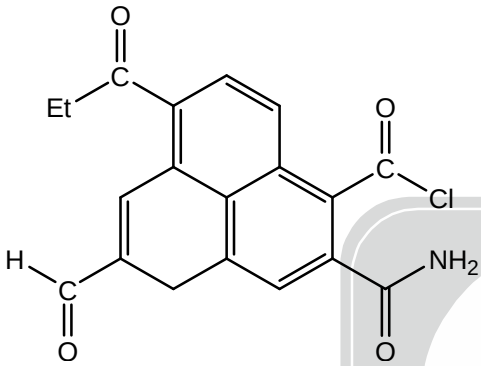


Soln.



Correct answer is (5)

55.



Number of moles of CH_3MgBr required to neutrals above compound is/are_____

Soln. Acid derivatives reacts two mole of CH_3MgBr and carbonyl compound (aldehyde or ketone) react with one mole of CH_3MgBr).

Correct option is (7).

56. Among the following neutral amino acids is/are

(1) Lyscine (2) Arginine (3) Valine (4) Aspartic acid

(5) isoleucine (6) Traphtophane (7) Leucine

Soln. Lyscine, Arginine are the basic amino acids.

Aspartic acid is the acidic amino acid.

Valine, isoleucine, Traphtophane and Leucine are the neutral amino acids.

Correct answer is (4)

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

Soln. • Optically purity also known as enantiomeric excess a compound of 90% B.E. shows 135° specific rotation.

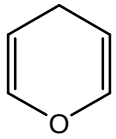
So, its 100% optically pure isomer will show $\frac{135}{90}\times 100 = 150^\circ$ specific rot.

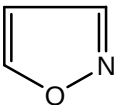
• At one hour the specific rotation reduced to 120°. So, E.E, or optical purity = $\frac{120}{150}\times 100 = 80\%$

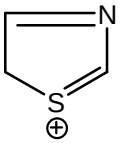
• At three hours optical purity is 40%. So, specific rotation = $\frac{150}{100}\times 40 = 60^\circ$

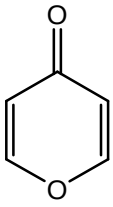
Correct answer is (60)

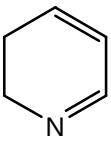
58. Among the following, how many are aromatic in nature?

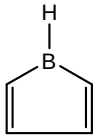
(A) 

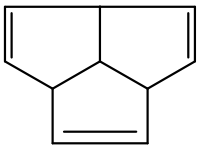
(B) 

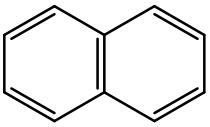
(C) 

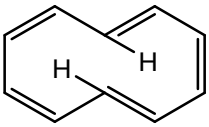
(D) 

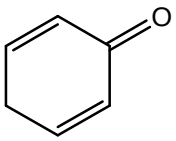
(E) 

(F) 

(G) 

(H) 

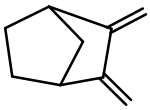
(I) 

(J) 

Soln. B, D, H aromatic in nature

Correct answer is (3)

59. For the below compound

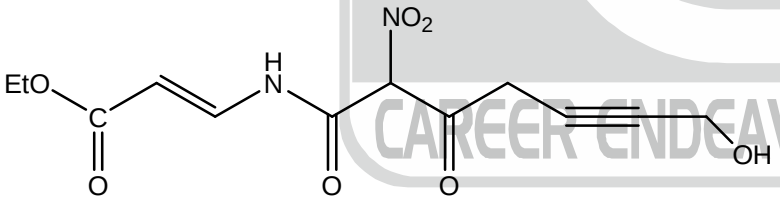


The λ_{max} value is _____ mμ

Soln.

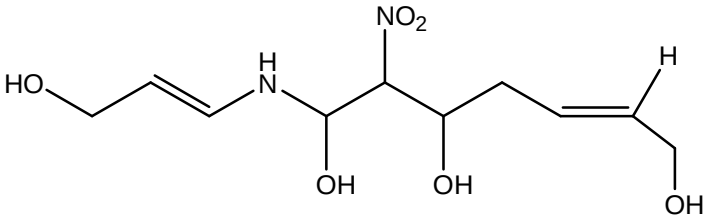
Basic value	= 217 mμ
2-Ring residues	= 10 mμ (2 × 5)
2-Exo cyclic double bonds	= 10 mμ
1-bicyclic system	= 15 mμ
	= 252 mμ

Correct answer is (252)

60. 

In the above structure, how many functional groups are reduced by $LiAlH_4$.

Soln. Total number of five functional groups reduced by $LiAlH_4$.



Correct answer is (5)

CAREER ENDEAVOUR
Best Institute for IIT-JAM, NET & GATE

IIT-JAM CHEMISTRY-CY

TEST SERIES - 2
(Organic Chemistry)

Date : 08-01-2017
Booklet : B

ANSWER KEY

Section-A : Multiple Choice Questions (MCQ)

1. (b)	**2.** (b)	**3.** (a)	**4.** (a)	**5.** (c)
6. (d)	**7.** (b)	**8.** (b)	**9.** (c)	**10.** (d)
11. (c)	**12.** (c)	**13.** (b)	**14.** (c)	**15.** (c)
16. (c)	**17.** (a)	**18.** (a)	**19.** (a)	**20.** (c)
21. (c)	**22.** (a)	**23.** (b)	**24.** (a)	**25.** (a)
26. (d)	**27.** (a)	**28.** (d)	**29.** (c)	**30.** (b)

Section-B : Multiple Select Questions (MSQ)

31. (a),(b), (c)	**32.** (a),(b), (c)	**33.** (c),(d)	**34.** (b), (c)
35. (a),(b),(c), (d)	**36.** (a), (b), (d)	**37.** (a),(b)	**38.** (a),(b), (c)
39. (a), (c), (d)	**40.** (a), (b), (d)		

Section-C : Numerical Answer Type (NAT)

41. (3)	**42.** (2)	**43.** (2)	**44.** (1)
45. (1755 to 1765)	**46.** (4)	**47.** (4)	**48.** (2)
49. (3.05)	**50.** (2)	**51.** (1)	**52.** (5)
53. (3)	**54.** (5)	**55.** (7)	**56.** (4)
57. (60)	**58.** (3)	**59.** (252)	**60.** (5)