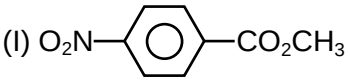
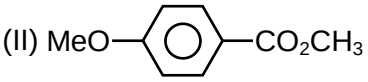
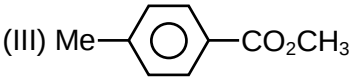
ORGANIC CHEMISTRY

IUPAC NOMENCLATURE, GOC & ISOMERISM

1. (I) 

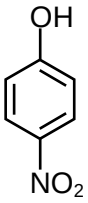
(II) 

(III) 

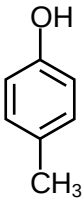
For the above three esters, the order of rates of alkaline hydrolysis is

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

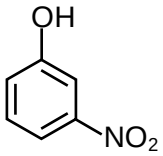
2. The correct order of acidity for the following compounds is:



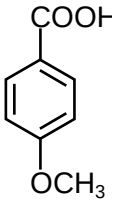
(I)



(II)



(III)



(IV)

(A) II < IV < III < I (B) II < III < I < IV (C) II < III < IV < I (D) III < II < I < IV

3. For the following carbocations, the correct order of stability is

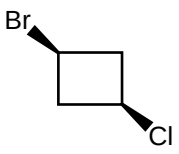
(I) $^{\oplus}CH_2–COCH_3$ (II) $^{\oplus}CH_2–OCH_3$ (III) $^{\oplus}CH_2–CH_3$

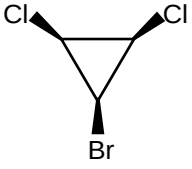
(A) III < II < I (B) II < I < III (C) I < II < III (D) I < III < II

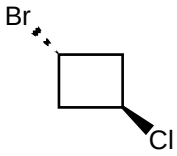
4. The total number of alkyl bromides (including stereoisomers) formed in the reaction $Me_3C–CH=CH_2 + HBr \rightarrow$ will be

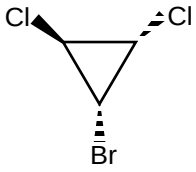
(A) 1 (B) 2 (C) 3 (D) No bromide forms

5. Which of the following compound is asymmetric ?

(A) 

(B) 

(C) 

(D) 

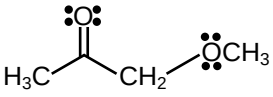
6. The compound, which evolves carbon dioxide on treatment with aqueous solution of sodium bicarbonate at 25°C is

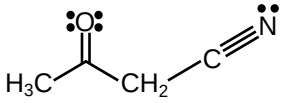
(A) C_6H_5OH (B) CH_3COCl (C) CH_3CONH_2 (D) $CH_3COOC_2H_5$

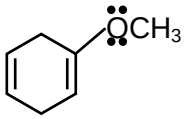
7. The indicated atom is not a nucleophilic site in

(A) $\underset{\uparrow}{B}H_4^-$ (B) $\underset{\uparrow}{C}H_3MgI$ (C) $CH_3\underset{\uparrow}{O}H$ (D) $CH_3\underset{\uparrow}{N}H_2$

8. The molecule/molecules that has/have delocalised lone pair(s) of electrons is/are

(I) 

(II) 

(III) 

(IV) $CH_3CH=CHCH_2\ddot{N}HCH_3$

(A) I, II and III (B) I, II and IV (C) I and III (D) Only III

9. The conformations of n-butane, commonly known as eclipsed, gauche and anti-conformations can be interconverted by

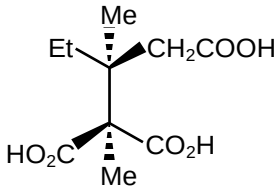
(A) rotation around C—H bond of a methyl group

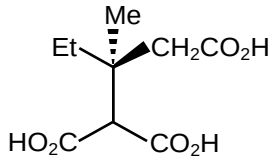
(B) rotation around C—H bond of a methylene group

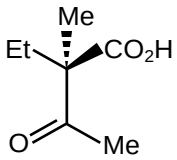
(C) rotation around C1-C2 linkage

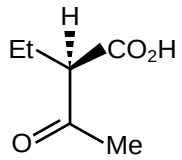
(D) rotation around C2-C3 linkage

10. The compound(s), capable of producing achiral compound on heating at 100°C is are

(A) 

(B) 

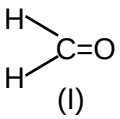
(C) 

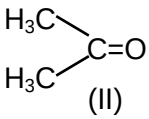
(D) 

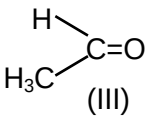
11. The ease of hydrolysis in the compounds CH_3COCl(I), $CH_3–CO–O–COCH_3$(II), $CH_3COOC_2H_5$(III) and CH_3CONH_2 (IV) is of the order

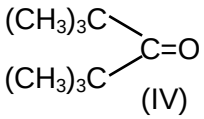
(A) I > II > III > IV (B) IV > III > II > I (C) I > II > IV > III (D) II > I > IV > III

12. The correct order of reactivity for the addition reaction of the following carbonyl compounds with ethylmagnesium iodide is


(I)


(II)


(III)


(IV)

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

13. Among Me_3N, C_5H_5N and MeCN (Me = methyl group) the electronegativity of N is in the order

(A) MeCN > C_5H_5N > Me_3N (B) C_5H_5N > Me_3N > MeCN
(C) Me_3N > MeCN > C_5H_5N (D) Electronegativity same in all

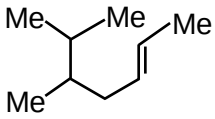
14. In the IUPAC system, $PhCH_2CH_2CO_2H$ is named as

(A) 3-phenylpropanoic acid (B) benzylacetic acid
(C) carboxyethylbenzene (D) 2-phenylpropanoic acid

15. The correct order of acid strengths of benzoic acid (X), peroxybenzoic acid (Y) and p-nitrobenzoic acid (Z) is

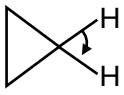
(A) Y > Z > X (B) Z > Y > X (C) Z > X > Y (D) Y > X > Z

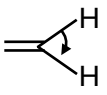
16. The IUPAC name of the following molecule is

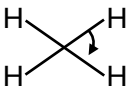


(A) 5, 6-dimethylhept-2-ene (B) 2, 3-dimethylhept-5-ene
(C) 5, 6-dimethylhept-2-ene (D) 5-iso-propylhex-2-ene

17. The correct order of decreasing H—C—H angle in the following molecule is

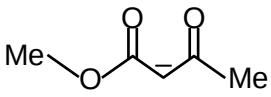

(I)

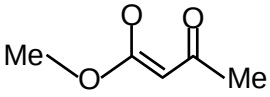

(II)

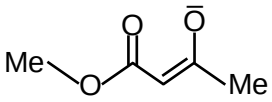

(III)

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

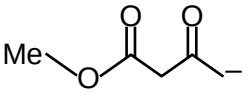
18. Among the following structures the one which is not a resonating structure of others is


(I)


(II)



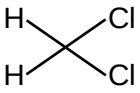
(III)



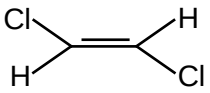
(IV)

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

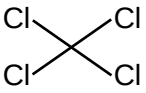
19. The compound that will have a permanent dipole moment among the following is



(I)



(II)



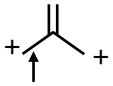
(III)

(IV)

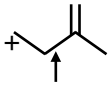
(A) I (B) II (C) III (D) IV

20. The correct order of decreasing length of the bond as indicated by the arrow in the following structures is

(I)



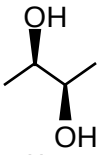
(II)



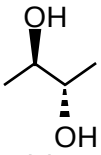
(III)

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

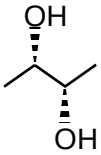
21. The correct statement regarding the following compounds is



(I)



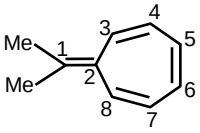
(II)



(III)

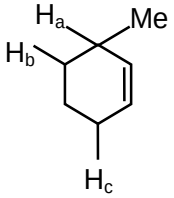
(A) all three compounds are chiral (B) only I and II are chiral
(C) I and III are diastereomers (D) only I and III are chiral

22. The most likely protonation site in the following molecule is



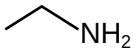
(A) C-1 (B) C-2 (C) C-3 (D) C-6

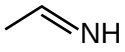
23. The order of decreasing ease of abstraction of hydrogen atoms in the following molecule

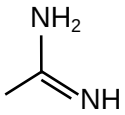


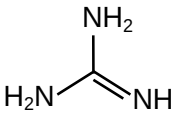
(A) $H_a > H_b > H_c$ (B) $H_a > H_c > H_b$ (C) $H_b > H_a > H_c$ (D) $H_c > H_b > H_a$

24. The correct order of basicity of the following compounds is


1

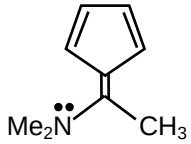

2


3

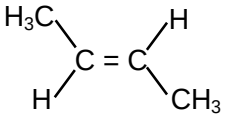
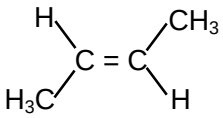

4

(A) 1 < 2 < 3 < 4 (B) 1 < 2 < 4 < 3 (C) 2 < 1 < 3 < 4 (D) 4 < 3 < 2 < 1

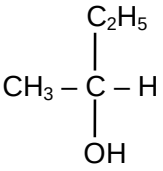
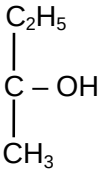
25. From the following compounds, choose the one which is not aromatic.

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

26. Chosse the correct statement(s) among the following.

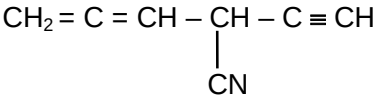
(A)  and  are enantiomers

(B) CH_3CHO on reaction with HCN gives racemic mixture

(C)  and  are enantiomers

(D) $CH_3 - CH = NOH$ shows geometrical isomerism

27. In the following compound, the number of sp-hybridised carbons are

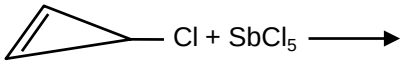


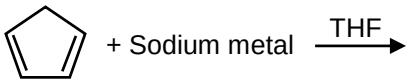
(A) 2 (B) 3 (C) 4 (D) 5

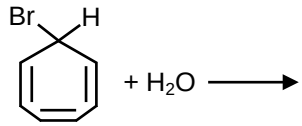
28. In a mixture, two enantiomers are found to be present in 85% and 15% respectively. The enantimoeric excess (ee) is

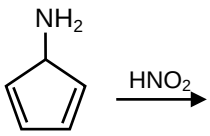
(A) 85% (B) 15% (C) 70% (D) 60%

29. The total number of aromatic species generated in the following reactions is

(i) 

(ii) 

(iii) 

(iv) 

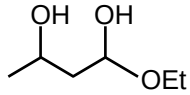
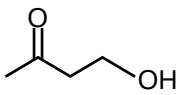
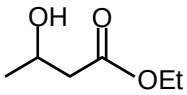
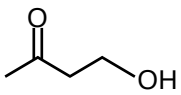
(A) Zero (B) 2 (C) 3 (D) 4

MIXED REACTIONS

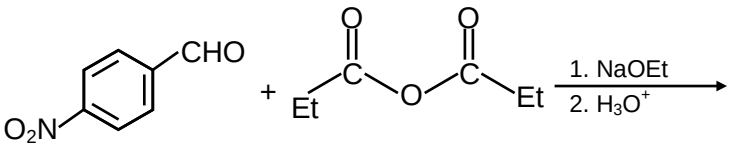
30. Ph—CDO $\xrightarrow[\text{Warm}]{50\%\text{aq.NaOH}}$ Ph—$COO^{\ominus}H$ + an alcohol. This alcohol is

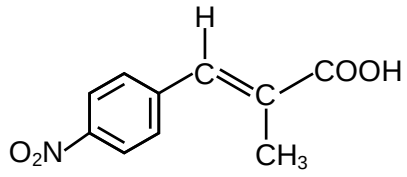
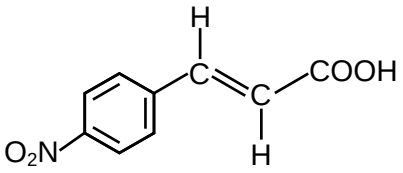
(A) Ph–CHD–OH (B) Ph–CHD–OD (C) Ph–CD_2–OH (D) Ph–CD_2–OD

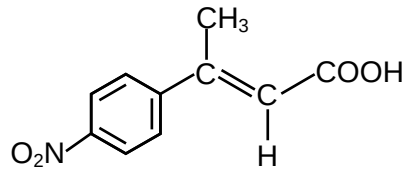
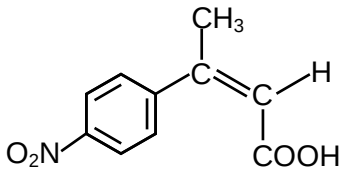
31. The reduction product of ethyl 3-oxobutanoate by $NaBH_4$ in methanol is

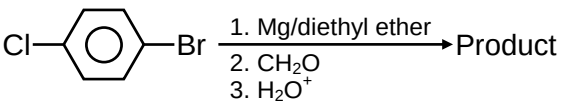
(A)  (B)  (C)  (D) 

32. What is the major product of the following reaction ?

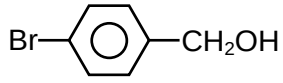
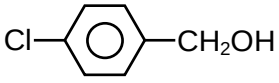


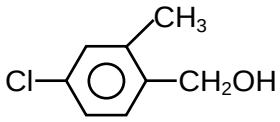
(A)  (B) 

(C)  (D) 

33. 

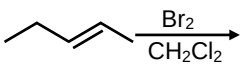
The product in the above reaction is

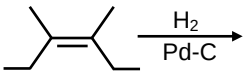
(A)  (B) 

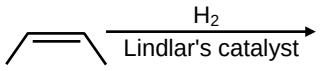
(C) 

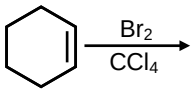
(D) 

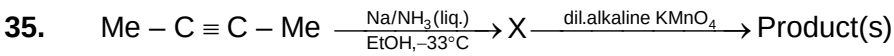
34. Which of the following reactions give(s) a meso-compound as the main product ?

(A) 

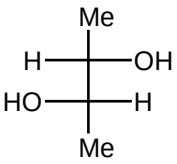
(B) 

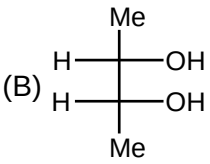
(C) 

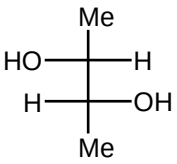
(D) 

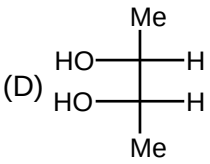
35. 

The product(s) from the above reaction will be

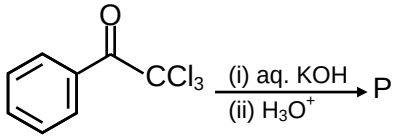
(A) 

(B) 

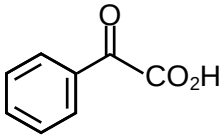
(C) 

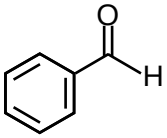
(D) 

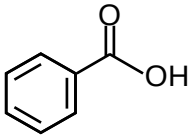
36. One of the products of the following reaction is P.

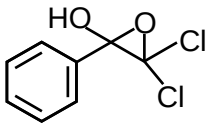


Structure of P is:

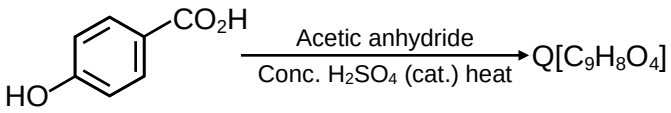
(A) 

(B) 

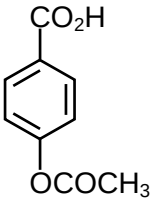
(C) 

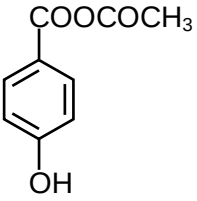
(D) 

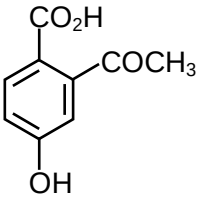
37. For the reaction below, the product is Q.

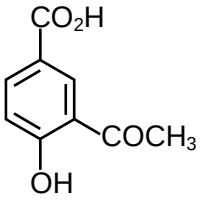


The compound Q is

(A) 

(B) 

(C) 

(D) 

38. Cyclopentanol on reaction with NaH followed by CS_2 and CH_3I produces a/an

(A) ketone (B) alkene (C) ether (D) xanthate

39. The correct order of the addition reaction rates of halogen acids with ethylene is

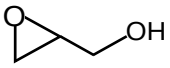
(A) hydrogen chloride > hydrogen bromide > hydrogen iodide

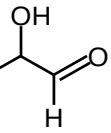
(B) hydrogen iodide > hydrogen bromide > hydrogen chloride

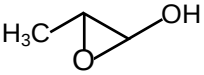
(C) hydrogen bromide > hydrogen chloride > hydrogen iodide

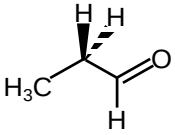
(D) hydrogen iodide > hydrogen chloride > hydrogen bromide

40. Oxidation of allyl alcohol with a peracid gives a compound of molecular formula $C_3H_6O_2$, which contains an asymmetric carbon atom. The structure of the compound is

(A) 

(B) 

(C) 

(D) 

41. $CH_3–C \equiv C\ MgBr$ can be prepared by the reaction of

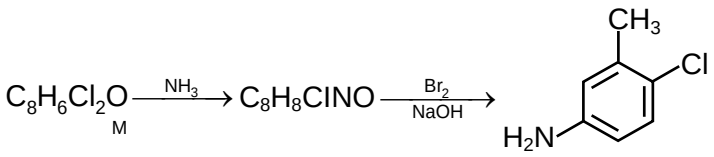
(A) $CH_3–C \equiv C–Br$ with $MgBr_2$ (B) $CH_3–C \equiv CH$ with $MgBr_2$

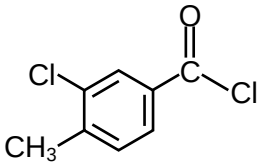
(C) $CH_3–C \equiv CH$ with KBr and Mg metal (D) $CH_3–C \equiv CH$ with CH_3MgBr

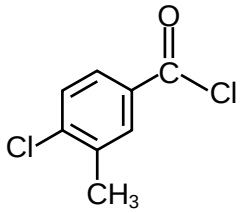
42. The number of alkene(s) which can produce 2-butanol by the successive treatment of (i) B_2H_6 in tetrahydrofuran solvent and (ii) alkaline H_2O_2 solution is

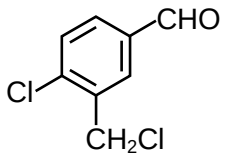
(A) 1 (B) 2 (C) 3 (D) 4

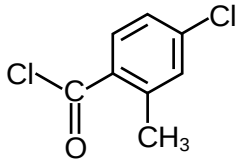
43. Identify 'M' in the following sequence of reactions



(A) 

(B) 

(C) 

(D) 

44. Methoxybenzene on treatment with HI proudces

(A) iodobenzene and methanol (B) phenol and methyl iodide

(C) iodobenzene and methyl iodide (D) phenol and methanol

45. If aniline is treated with conc. H_2SO_4 and heated at 200°C, the product is

(A) anilinium sulphate (B) benzenesulphonic acid

(C) m-aminobenzenesulphonic acid (D) sulphanilic acid

46. [P] $\xrightarrow{Br_2}$ C_2H_4Br $\xrightarrow[NH_3]{NaNH_2}$ [Q]

[Q] $\xrightarrow[Hg^{2+},\Delta]{20\%\ H_2SO_4}$ [R] $\xrightarrow{Zn-Hg/HCl}$ [S]

The species P, Q, R and S respectively are

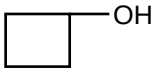
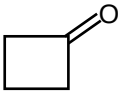
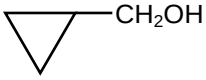
(A) ethene, ethyne, ethanol, ethane (B) ethane, ethyne, ethanal, ethene

(C) ethene, ethyne, ethanal, ethanol (D) ethyne, ethane, ethane, ethanal

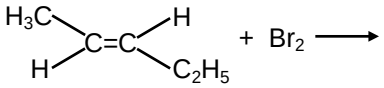
47. The number of possible organobromine compounds which can be obtained in the allylic bromination of 1-butene with N-bromosuccinimide is

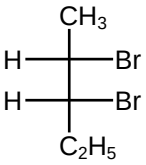
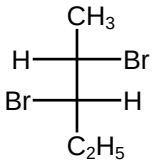
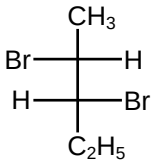
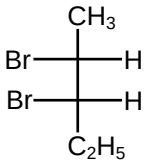
(A) 1 (B) 2 (C) 3 (D) 4

48. The possible product(s) to be obtained from the reaction of cyclobutyl amine with HNO_2 is/are

(A)  (B)  (C)  (D) $H_2C=CH_2$

49. The major products obtained in the following reaction is/are



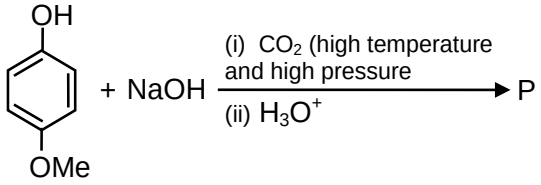
(A)  (B)  (C)  (D) 

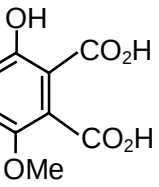
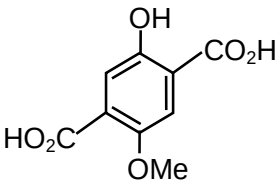
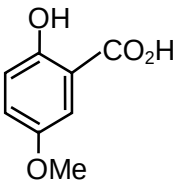
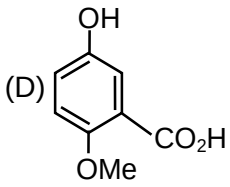
50. The isomerisation of 1-butyne to 2-butyne can be achieved by treatment with

(A) hydrochloric acid (B) ammoniacal silver nitrate

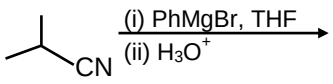
(C) ammoniacal cuprous chloride (D) ethanolic potassium hydroxide

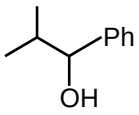
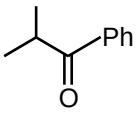
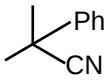
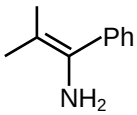
51. The structure of the product P of the following reaction is



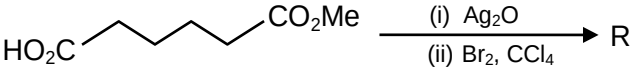
(A)  (B)  (C)  (D) 

52. For the reaction below

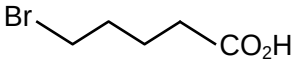
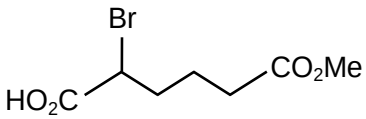


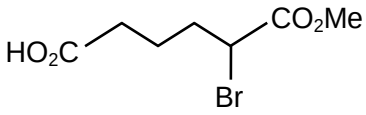
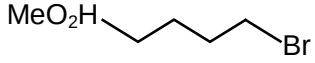
(A)  (B)  (C)  (D) 

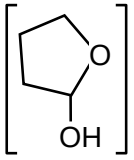
53. The reaction sequence given below given product R.

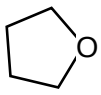
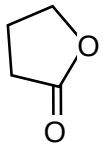


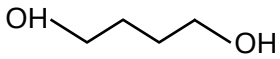
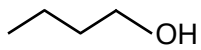
The structure of the product R is

(A)  (B) 

(C)  (D) 

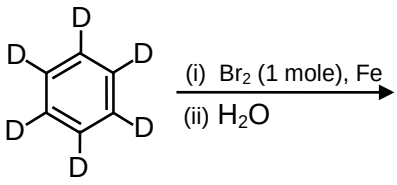
54. Reaction of the lactol S  with NaOH followed by

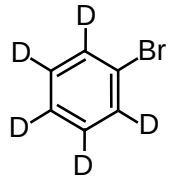
(A)  (B) 

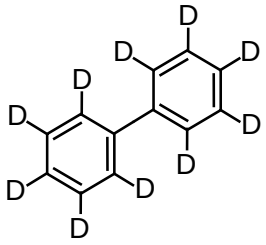
(C)  (D) 

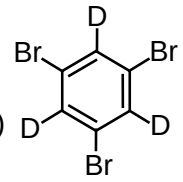
55. The reduction of benzenediazonium chloride to phenyl hydrazine can be accomplished by
(A) $SnCl_2$, HCl (B) Na_2SO_3 (C) CH_3CH_2OH (D) H_3PO_2

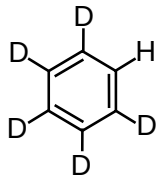
56. The major product(s) obtained form the following reaction of 1 mole of hexadeuteriobenzene is/are



(A) 

(B) 

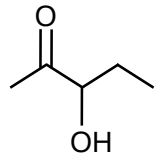
(C) 

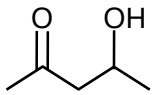
(D) 

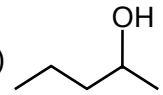
57. Amongst the following compounds, the one that will not respond to Cannizzaro reaction upon treatment with alkali is

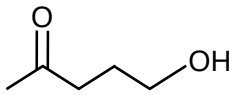
(A) Cl_3CCHO (B) Me_3CCHO (C) C_6H_5CHO (D) HCHO

58. Which of the following will be dehydrated most readily in alkaline medium?

(A) 

(B) 

(C) 

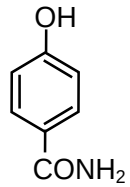
(D) 

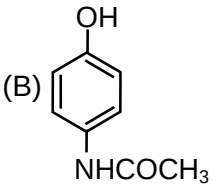
59. Which of the following reactions will not result in the formation of carbon-carbon bonds?

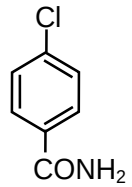
(A) Cannizzaro reaction (B) Wurtz reaction

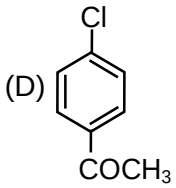
(C) Reimer-Tiemann reaction (D) Friedel-Crafts acylation

60. The correct structure of the drug paracetamol is

(A) 

(B) 

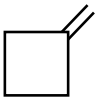
(C) 

(D) 

61. Ozonolysis of an alkene produces only one dicarbonyl compound. The structure of the alkene is

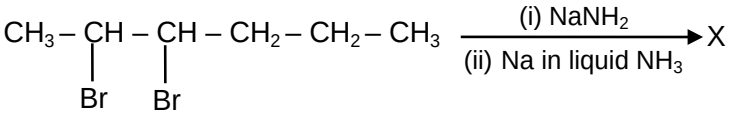
(A) $CH_3 - CH = CH - CH_3$

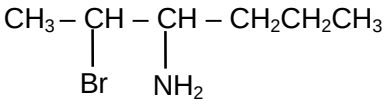
(B) 

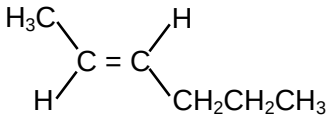
(C) 

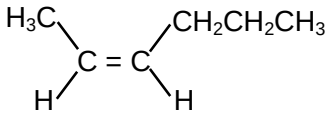
(D) $CH_3 - CH = CH - CH = CH_2$

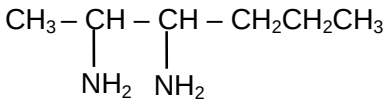
62. Identify X in the following sequence of reactions.



(A) 

(B) 

(C) 

(D) 

63. The major products obtained during ozonolysis of 2, 3-dimethyl-1-butene and subsequent reductions with Zn and H_2O are

(A) methanoic acid and 2-methyl-2-butanone

(B) methanal and 3-methyl-2-butanone

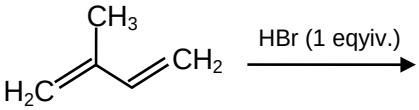
(C) methanol and 2, 2-dimethyl-3-butanone

(D) methanoic acid and 2-methyl-3-butanone

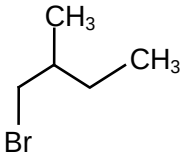
64. Amongst the following compounds, the one(s) which readily react with ethanolic KCN.

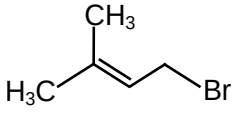
(A) Ethyl chloride (B) Chlorobenzene

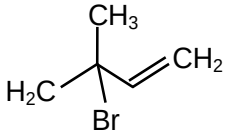
(C) Benzaldehyde (D) Salicylic acid

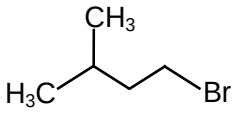
65. 

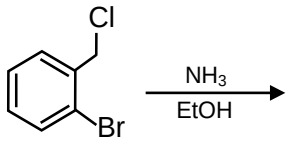
The major product of the above reaction is

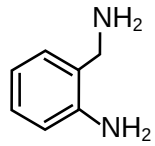
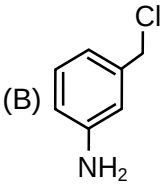
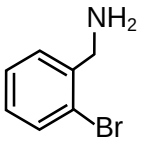
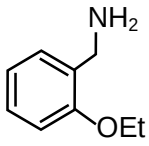
(A) 

(B) 

(C) 

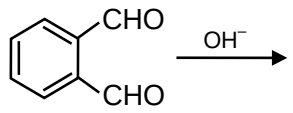
(D) 

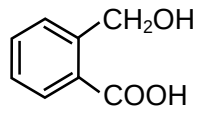
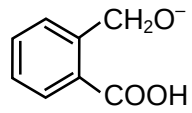
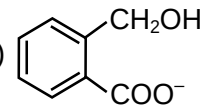
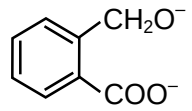
66.  The product of the above reaction is

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

67. 1, 4-dimethylbenzene on heating with anhydrous $AlCl_3$ and HCl produces

(A) 1, 2-dimethylbenzene (B) 1, 3-dimethylbenzene
(C) 1, 2, 3-trimethylbenzene (D) ethylbenzene

68.  ? The product of the above reaction is

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

69. The reaction of methyltrichloracetate (Cl_3CCO_2Me) with sodium methoxide (NaOMe) generates

(A) carbocation (B) carbene (C) carbanion (D) carbon radical

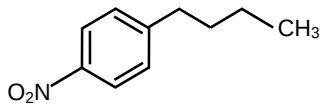
70. Best reagent the nuclear iodination of aromatic compounds is

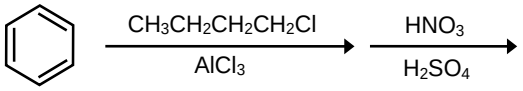
(A) KI/CH_3COCH_3 (B) I_2/CH_3CN
(C) KI/CH_3COOH (D) I_2/HNO_3

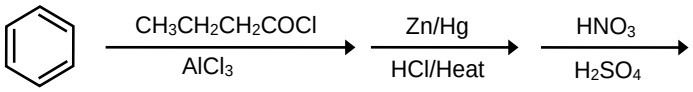
71. In the reaction R MgBr + $HC(OEt)_3$ $\xrightarrow{\text{Ether, } H_3O^+}$ P the product P is

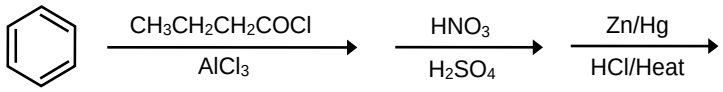
(A) RCHO (B) R_2CHOEt (C) R_3CH (D) $RCH(OEt)_2$

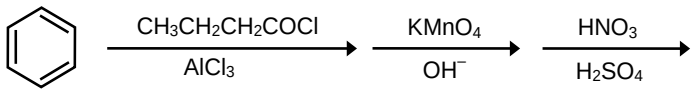
72. Identify the correct method for the synthesis of the compound shown below from the following alternatives



(A) 

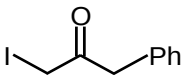
(B) 

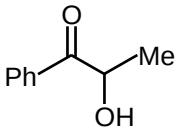
(C) 

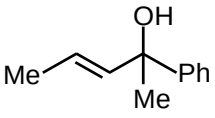
(D) 

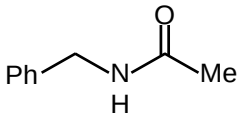
POC, BIOMOLECULE, POLYMER AND CHEMISTRY IN EVERYDAY LIFE

73. Haloform reaction with I_2 and KOH will be responded by

(A*) 

(B*) 

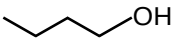
(C) 

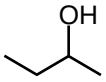
(D) 

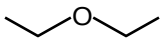
74. $C_4H_{10}O \xrightarrow[H_2SO_4]{K_2Cr_2O_7} C_4H_8O \xrightarrow[Warm]{I_2/NaOH} CHI_3$

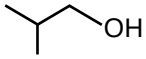
N

Here, N is

(A) 

(B) 

(C) 

(D) 

75. Which one of the following is a condensation polymer ?

(A) PVC (B) Teflon (C) Dacron (D) Polystyrene

76. ADP and ATP differ in the number of

(A) phosphate units (B) ribose units (C) adenine base (D) nitrogen atom

77. The compound that would produce a nauseating smell/odour with a hot mixture of chloroform and ethanolic potassium hydroxide is

(A) $PhCONH_2$ (B) $PhNHCH_3$ (C) $PhNH_2$ (D) PhOH

78. Which of the following compound would not react with Lucas reagent at room temperature?

(A) $H_2C = CHCH_2OH$ (B) $C_6H_5CH_2OH$

(C) $CH_3CH_2CH_2OH$ (D) $(CH_3)_3COH$

79. Amongst the following compounds, the one which would not respond to iodoform test is

(A) $CH_3CH(OH)CH_2CH_3$ (B) $ICH_2COCH_2CH_3$

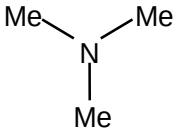
(C) CH_3COOH (D) CH_3CHO

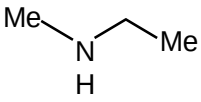
80. In the Lassaigne's test for the detection of nitrogen in an organic compound, the appearance of blue coloured compound is due to

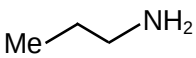
(A) ferric ferricyanide (B) ferrous ferricyanide

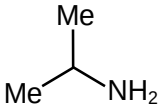
(C) ferric ferrocyanide (D) ferrous

81. An amine C_3H_9N reacts with benzene sulphonyl chloride to form a white precipitate which is insoluble in aq. NaOH. The amine is

(A) 

(B) 

(C) 

(D) 

82. In DNA, the consecutive deoxynucleotides are connected via

(A) phosphodiester linkage (B) phosphomonoester linkage

(C) phosphotriester linkage (D) amide linkage

83. Within the list shown below, the correct pair of structures of alanine in pH ranges 2-4 and 9-11 is

I. $H_3N^+ - CH(CH_3)CO_2H$ II. $H_2N - CH(CH_3)CO_2^-$

III. $H_3N^+ - CH(CH_3)CO_2^-$ IV. $H_2N - CH(CH_3)CO_2H$

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

ANSWER KEY

1.	(C)	**2.**	(B)	**3.**	(D)	**4.**	(C)	**5.**	(D)
6.	(B)	**7.**	(A)	**8.**	(D)	**9.**	(D)	**10.**	(D)
11.	(A)	**12.**	(A)	**13.**	(A)	**14.**	(A)	**15.**	(C)
16.	(A)	**17.**	(B)	**18.**	(D)	**19.**	(A)	**20.**	(C)
21.	(D)	**22.**	(A)	**23.**	(B)	**24.**	(C)	**25.**	(B)
26.	(BD)	**27.**	(C)	**28.**	(C)	**29.**	(C)	**30.**	(C)
31.	(C)	**32.**	(A)	**33.**	(D)	**34.**	(B)	**35.**	(AC)
36.	(C)	**37.**	(A)	**38.**	(D)	**39.**	(B)	**40.**	(A)
41.	(D)	**42.**	(B)	**43.**	(B)	**44.**	(B)	**45.**	(D)
46.	(A)	**47.**	(A)	**48.**	(AC)	**49.**	(AD)	**50.**	(D)
51.	(C)	**52.**	(B)	**53.**	(D)	**54.**	(C)	**55.**	(A)
56.	(A)	**57.**	(A)	**58.**	(B)	**59.**	(A)	**60.**	(B)
61.	(B)	**62.**	(B)	**63.**	(B)	**64.**	(AC)	**65.**	(B)
66.	(C)	**67.**	(B)	**68.**	(C)	**69.**	(B)	**70.**	(D)
71.	(A)	**72.**	(B)	**73.**	(AB)	**74.**	(B)	**75.**	(C)
76.	(A)	**77.**	(C)	**78.**	(C)	**79.**	(C)	**80.**	(C)
81.	(B)	**82.**	(A)	**83.**	(A)				