CHEMISTRY

BOOKS - MODERN PUBLICATION CHEMISTRY (KANNADA ENGLISH)

ORGANIC CHEMISTRY : SOME BASIC PRINCIPLES

Multiple Choice Questions Level I

1. The maximum catenation tendency of carbon is due to :

A. 1.Its tetravalency

B. 2.Larger strength of carbon to carbon bond as compared to that of other atoms

C. 3.Its electronegativity value close to other atoms (H, N, O, S) with which it forms bonds

D. 4.Its tendency to form multiple bonds.

Answer: B

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2. Which of the following statements not correct regarding sp hybridisation of carbon ?

A. 1.It is shown by compounds with $C \equiv C$ bond

B. 2.It leads to the formation of two hybridised and two unhybridised orbitals of carbon

C. 3.It results in tetrahedral geometry

D. 4.The bond angle in compounds containing sp hybrid orbitals is 180°

Answer: C

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3. Which of the following stetments is not correct regarding the geometry of acetylene ?

A. the carbon atoms in acetylene involve sp-hybridisation

B. $H-C-C$ bond angle in acetylene is 180°

C. in acetylene, there are one σ and two π bonds

D. the $C-C$ bond length in acetylene is more than the bond length in ethylene.

Answer: D

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4. The bond between carbon atoms 1 and 2 in the compound : $N \equiv \overset{1}{C}-\overset{2}{C}H=CH_2$ involves the hybridised carbon as :

A. sp^2 and sp^2

B. sp^3 and sp

C. sp and sp^2

D. sp and sp.

Answer: C

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5. Which of the following has shortest $C - C$ bond length ?

A. C_2H_6

B. C_2H_4

C. C_2H_2

D. C_2H_5Cl.

Answer: C

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6. The hybridisation of carbon atoms in $C-C$ single bond of $HC \equiv C-CH=CH_2$ is :

A. sp^3, sp^3

B. sp^2, sp^3

C. sp, sp^2

D. sp^3, sp.

Answer: C

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7. Which of the following hybrid orbitals has highest s - character ?

A. sp^3

B. sp^2

C. sp

D. All have same s-character.

Answer: C

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8. Which of the following is not a cyclic compound ?

A. Anthracene

B. Pyrrole

C. Isobutylene

D. Phenol.

Answer: C

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9. The suffix for alcohols, aldehydes and ketones, according to IUPAC system are respectively :

A. $-\text{ane}, \ -\text{ald}, \ -\text{keto}$

B. $-\text{al}, \ -\text{al}, \ -\text{Ket}$

C. $-\text{ol}, \ -\text{al}, \ -\text{one}$

D. $-\text{ol}, \ -\text{de}, \ -\text{ne}.$

Answer: C

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10. According to the IUPAC system CH_3CH_2COCl is named as :

A. Chloropropane

B. Propanoyl chloride

C. Chloropropanyl

D. Proponyl chloride.

Answer: B

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11. The IUPAC name for the compound :

$CH_3 - \underset{\underset{C_2H_5}{|}}{CH} - CH_2 - \underset{\underset{OH}{|}}{CH} - CH_3$ is

A. 4-Ethylpentan-2-ol

B. 2-Ethylpentan-4-ol

C. 4-Methyl-2 hydrocyhexane

D. 4-Methylhexan-2-ol.

Answer: D

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12. The IUPAC name for the compound :

$CH_3 - \underset{\underset{O}{||}}{C} - CH_2 - CH_2OH$ is

A. 3-Keto-1-butanol

B. 1-Hydroxy-3-butanone

C. 4-Hydroxy-2-butanone

D. 2-Keto-4-butanol.

Answer: C

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13. The correct IUPAC name for the compound $(CH_3)_3COH$ is :

A. Trimethylmethan-1-ol

B. 1,1,1-Trimethylmethan-1-ol

C. 1-Butanol

D. 2-Methylpropan-2-ol

Answer: D

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14. What is the IUPAC name of the compound :

$$\underset{\underset{OH}{|}}{CH_2} - \underset{\underset{NH_2}{|}}{CH} - COOH$$

A. 1-Hydrocy-2-amino-3-propanoic acid

B. 2-Hydroxy-1-amino-propanoic acid

C. 2-Amino-3-hydroxypropanoic acid

D. 1-Amino-2-hydroxypropanoic acid.

Answer: C

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15. Which of the following compounds contain amide functional group ?

A. $CH_3CH_2NHCH_3$

B. $CH_3N(CH_3)_2$

C. $CH_3CH_2 - CO - NH_2$

D. $CH_3 - \underset{\underset{NH_2}{|}}{CH}COOH.$

Answer: C

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16. Which of the following formulae represents 2, 5-Dibromo-4-ethyl-2-heptenal according to IUPAC rules ?

A. $CH_3 - \underset{\underset{Br}{|}}{C} - CH = \underset{\underset{C_2H_5}{|}}{CH} - \underset{\underset{Br}{|}}{CH} - CH_2 - CH_2 - CH_3$

B. $CH_3 - \underset{\underset{Br}{|}}{C} = CH - \underset{\underset{C_2H_5}{|}}{CH} - \underset{\underset{Br}{|}}{CH} - CH_2 - CH_2 - CHO$

C. $CH_3 - CH_2 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{C_2H_5}{|}}{CH} - CH = \underset{\underset{Br}{|}}{C} - CHO$

D. $CH_3 - CH_2 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{C_2H_5}{|}}{CH} - CH = C - \underset{\underset{Br}{|}}{CH_2} - CHO.$

Answer: C

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17. The IUPAC name for the compound

$CH_3CH = \underset{\underset{C \equiv CH}{|}}{CHCHCH_3}$ is :

A. 4-Ethyl pent -2-ene

B. 1-Ethyl-3-methyl but -2-ene

C. 3-Methyl hex -4-en-1-yne

D. 4-Methyl hax -2-en-5-yne.

Answer: C

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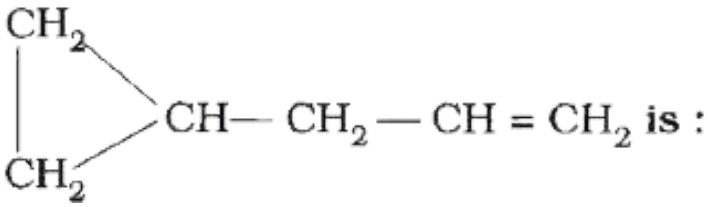
18. The IUPAC name of the compound :



A. 3-Cyclopropane -1-propene

B. Cyclohex-1-ene

C. 4-Cyclopropyl-1-butane

D. 3-Cyclopropyl-1-propene.

Answer: D

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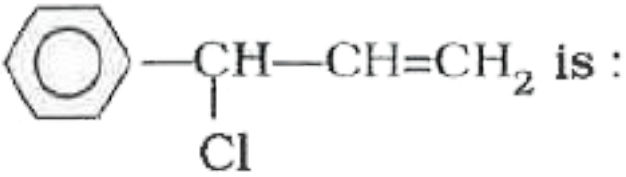
19. The IUPAC name of the compound :



A. 3-Phynyl-3-chloro-1-propene

B. 3-Benzyl-3-chloro-1-propene

C. 3-Chloro-3-phenyl-1-propene

D. 3-Chloropropene benzene

Answer: C

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20. The structure of neopentane is :

A. $CH_3CH_2CH_2CH_2CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH}CH_2CH_3$

C. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_3$

D. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2 - CH_2CH_3.$

Answer: C

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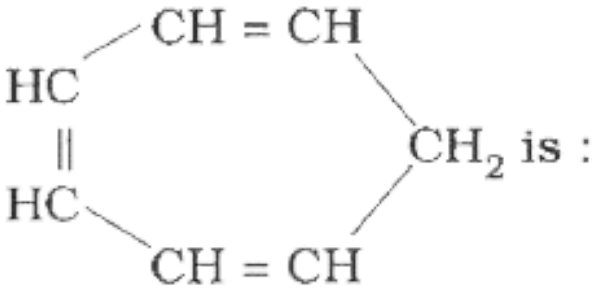
21. The IUPAC name of the compound :



A. 1,3,5-Cycloheptene

B. 1,3,5-Cyclooctene

C. 1,3,5-Cycloheptatriene

D. 1,3,5-Cycloheptene.

Answer: C

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22. The structure of methyl phenyl ether is :

A. $CH_3OC_2H_5$

B. $CH_3COC_6H_5$

C. $CH_3OC_6H_5$

D. $C_6H_5OC_6H_5$.

Answer: C

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23. The first organic compound synthesised in the laboratory was :

A. urea

B. formic acid

C. benzene

D. methanol.

Answer: A

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24. Which of the following molecules involves sp^2 hybridisation of the carbon atoms ?

A. CH_3CH_3

B. $CH_2 = CH_2$

C. $HC \equiv CH$

D. $CH_3\underset{\underset{CH_3}{|}}{C}HCH_3$

Answer: B

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25. The number of $\pi -$ bonds in naphthalene is :

A. Six

B. Five

C. Ten

D. Eight.

Answer: B

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26. The IUPAC name of ether :

$CH_3 - O - C_2H_5$ is :

A. Methyl ethyl ether

B. Ethoxy methane

C. Methoxy ethane

D. Eethyl methyl ether.

Answer: C

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27. The correct IUPAC name of the compound :

$$H-\overset{\overset{O}{||}}{C}-\overset{\overset{O}{||}}{C}-H$$ is :

A. Formyl methane

B. Formyl methanoate

C. 1,2-Ethanedial

D. 1,2-Ethanedione

Answer: C

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28. The IUPAC name of the compound $(C_2H_5)_4C$ is :

A. Tetraethyl methane

B. 3,3-Diethyl pentane

C. 3-ethylheptane

D. 1,1,1-Triethyl propane

Answer: B

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29. The IIUPAC name of $C_{17}H_{35}COOH$ is :

A. Heptadecanoic acid

B. Octadecanoic acid

C. Stearic acid

D. 2-Methyl hexadecanoic acid.

Answer: B

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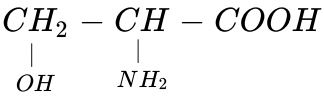
30. What is the IUPAC name of the compound :



A. 2-Amino-3-hydroxy propanoic acid

B. 1-Hydrocy-2-aminopropan-3-oic acid

C. 1-Amino-2-hydroxy propanoic acid

D. 3-Hydrocy-2-amino propanoic acid.

Answer: A

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31. C_nH_{2n} is the general formula of :

A. Only alkenes

B. Only alkynes

C. Only arenes

D. Both alkenes and cycloalkanes.

Answer: D

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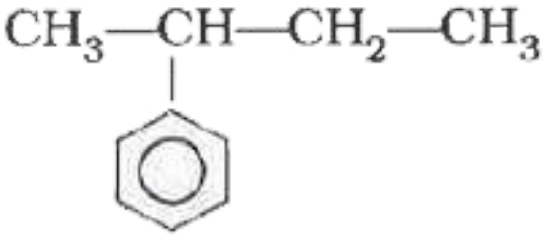
32. The IUPAC name of the following compound is :



A. 2-Cyclohexyl butane

B. 2-Phenyl butane

C. 3-Cyclohecyl butane

D. 3-Phenyl butane.

Answer: B

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33. The common name of the compound :

$CH_3CH_2C(CH_3)_3$ is :

A. Trimethyl propane

B. Neopentane

C. Neohexane

D. 2,2-Dimethyl butane.

Answer: C

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34. How many primary carbon atoms are present in a 2,2,4-trimethyl pentane ?

A. Four

B. One

C. Six

D. Five.

Answer: D

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35. The compounds having a common difference of CH_2 in their molecular formulae are known as :

A. Isomers

B. Homologues

C. Polymers

D. Isostructural.

Answer: B

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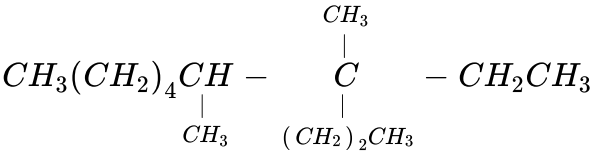
36. What is the correct IUPAC name of the following compound ?



A. 3,4-Dimethyl-3-n-propylnonane

B. 4,5-Dimethyl-4-ethyldecane

C. 6,7-Dimethyl-7-n-propylnonane

D. 6,7-Dimethyl-7-ethyldecane.

Answer: B

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37. The IUPAC name of the compound :

$CH_3CONH(Br)$ is :

A. 1-Bromoacetamide

B. N-Bromoethanamide

C. Ethanoyl bromide

D. N-Bromomethanamide.

Answer: B

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38. The total number of tertiary carbon atoms in 4, 5-dimethyl-2-hexanol is :

A. Two

B. Three

C. One

D. Four

Answer: A

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39. The correct IUPAC name of acetonitrile is :

A. Ethanenitrile

B. Cyanomethane

C. Methanenitrile

D. Cyanoethane.

Answer: A

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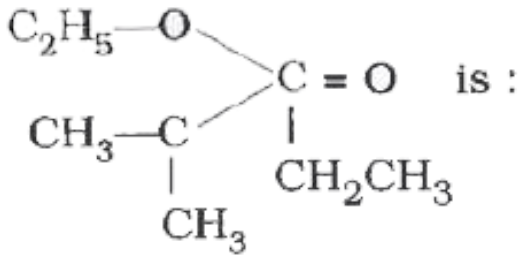
40. The IUPAC name of the compound



is :

is :

A. Ethyl-2-methyl propanoate

B. 2-Methyl ethoxy propanone

C. Ethoxy propanoate

D. 2-Methylethoxy propanone.

Answer: A

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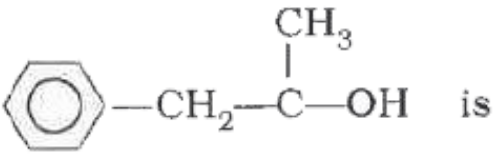
41. The IUPAC name of the compound



is :

A. 3-Methyl-4-cyclohexyl butan-3-ol

B. 1-Ethyl-1-1methyl-2-phenyl ethanol

C. 3-phenyl -2-propanol

D. 3-Methyl-1-4-phenyl butan-3-ol.

Answer: C

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42. The IUPAC name of the compound

$$\underset{\underset{CN}{|}}{CH_2} - \underset{\underset{CN}{|}}{CH} - \underset{\underset{CN}{|}}{CH_2}$$ is

A. 3-Cyanopropane-1,5-dinitrile

B. 1,2,3-Propane tricarbonitrile

C. Propane tricarbylamine

D. 1,2,3-Tricyanopropane.

Answer: D

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43. The systematic name of : $CH_3 - CHBr - CH_2OH$ is

A. 3-Hydroxy-2-bromopropane

B. 1-Hydroxy-2-bromopropane

C. 2-Bromo-1-propanol

D. 3-Hydroxy isopropyl bromide.

Answer: C

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44. The IUPAC name of $(C_2H_5)_2CHCH_2OH$ is :

A. 2-Ethyl butan-1-ol

B. 2-Methyl pentan-ol

C. 2-Ethyl pentan-ol

D. 3-Ethyl butan-ol.

Answer: A

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45. The IUPAC name of $CH_3COOC_2H_5$ will be :

A. Ethyl acetate

B. Ethyl ethanoate

C. Methyl propanoate

D. None of these.

Answer: B

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46. Which one of the following IUPAC names is correct ?

A. 2-Methyl-3-pentane

B. 2-Ethyl-3-methyl pentan

C. 2-Ethyl-3-methyl pentane

D. 3-Methyl-2-ethyl pentane.

Answer: C

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47. Neo - heptyl alcohol has the formula :

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - \underset{\underset{OH}{|}}{CH} - CH_2CH_3$

B. $CH_3 - \underset{\underset{OH}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2CH_2CH_2 - CH_3$

C. $C_2H_5 - \underset{\underset{C_2H_5}{|}}{\overset{\overset{C_2H_5}{|}}{C}} - OH$

D. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2CH_2CH_2OH$

Answer: D

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48. The IUPAC name of the compound :

$CH_3 - \underset{\underset{CH_2 - CH_3}{|}}{CH} - CHO$ is :

A. Butan-2-aldehyde

B. 2-Ethyl propanal

C. 2-Methyl butanal

D. 3-Methyl propanal.

Answer: C

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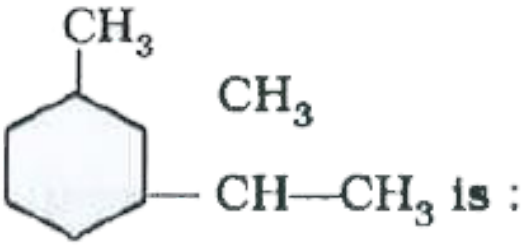
49. The IUPAC name of the compound



is :

A. 3-methy-1-isopropylcyclohexane

B. 1-methyl-3-isopropyl cyclohexane

C. 1-isopropyl-3-methyl cyclohexane

D. 1-isopropyl-5-methyl cyclohexane.

Answer: C

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50. The IUPAC name of the compound :

is :

A. Cyclohexane methanal

B. Formyl cyclohexane

C. 1-methylcyclohexane carbaldehyde

D. Cyclohexanethanal.

Answer: C

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51. The IUPAC name of the compound :

$CH_3 - CH_2 - \underset{\underset{OCH_3}{|}}{C} = O$ is :

A. Methoxypropanone

B. Methoxypropanal

C. Methyl propanoate

D. Methoxy ethyl ketone.

Answer: C

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52. The IUPAC name of the compound :

$(CH_3)_2CHCH_2CH_2Br$ is :

A. 1-Bromopentane

B. 2-Methyl-4-bromopentane

C. 1-Bromo-3-methyl butane

D. 2-Methyl-3-bromopropane.

Answer: C

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53. The IUPAC name of the compound :

$(CH_3)_3C - CH = CH_2$ is

A. 2,2-Dimethylbut-2-ene

B. 2,2-Dimethylpent-3-ene

C. 3,3-Dimethylbut -1-ene

D. Hex-1-ene

Answer: C

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54. The number of π bonds in

$CH_2 = CH - CH = CH - C \equiv CH$ is

A. 4

B. 3

C. 2

D. 5

Answer: A

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55. The structure of 4-methyl-2-pentan-1-ol is :

A. $CH_3CH_2CH = CHCH_2OH$

B. $(CH_3)_2C = CHCH_2CH_2OH$

C. $(CH_3)_2CHCH = CHCH_2OH$

D. $CH_3CH_H - CH = C(CH_3)_2$

Answer: C

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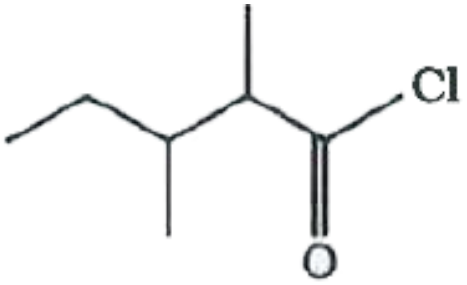
56. The IUPAC name of



is :

A. 1-chloro-1-oxo-2,3dimenthyl pentane

B. 2-ethyl-3-methyl butanoyl chloride

C. 2,3-dimethyl pentanoyl chloride

D. 3,4-dimethyl pentanoyl chloride.

Answer: C

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57. Which of the following species has electron releasing (or+I inductive) effect ?

A. $-NO_2$

B. $-COOH$

C. $(CH_3)_2CH-$

D. $C_6H_5^-$.

Answer: C

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58. The displacement of electrons in a multiple bond in the presence of attacking reagent is called

A. inductive effect

B. electromeric effect

C. resonance

D. hyperconjugation

Answer: B

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59. Which of the following pairs represents only electrophiles ?

A. H_3O^+, SO_3

B. H_2O, H^+

C. NO_3^+, NH_2

D. $OH^-, R-O-H.$

Answer: A

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60. Which of the following carbocations will be the most stable ?

A. CH_3^+

B. $CH_3CH_2^+$

C. $(CH_3)_2CH^+$

D. $(CH_3)_3C^+.$

Answer: D

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61. Which of the following carbocations will be the most stable ?

A. $(CH_3)_2CH^+$

B. Ph_3C^+

C. $CH_2 = CHCH_2^+$

D. $CH_3CH_2^+$.

Answer: B

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62. In terms of relative stability, which of the following is in general, wrong :

A. 1. tertiary free radicals are more stable than secondary.

B. 2. secondary free radicals are more stable than primary.

C. 3. tertiary carbonium ion is less stable than secondary.

D. 4. secondary carbanion is less stable than primary.

Answer: C

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63. Which of the following is not the correct condition for resonance ?

A. the positions of all the atomic nuclei in the resonating structures are not the same.

B. the resonating structures must have the same number of unpaired or paired electrons.

C. the molecules exhibiting resonance must be planar in nature.

D. the resonating structures must have nearly the same energies.

Answer: C

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64. Which of the following carbonium ions has the least stability ?

A. Methyl

B. ethyl

C. isopropyl

D. tert-butyl.

Answer: A

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65. The shape of carbomium ion is :

A. Planar

B. Linear

C. Pyramidal

D. Tetrahedral.

Answer: C

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66. What is the hybridization of central C-atom in trimethyl carbonium ion ?

A. sp

B. sp^2

C. sp^3

D. sp^2 and sp.

Answer: C

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67. Which of the following is not a nucleophile ?

A. CN^-

B. OH^-

C. NH_3

D. BF_3

Answer: C

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68. A nucleophile is a :

A. Lewis acid

B. Lewis base

C. Both Lewis acid and Lewix base

D. Neither a Lewis acid nor a Lewis base.

Answer: B

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69. Which of the following shows electromeric effect ?

A. alkyl halides

B. alkyl amines

C. aldehydes

D. alkanes.

Answer: C

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70. Which of the following undergoes electrophilic substitution reaction ?

A. Benzene

B. Alkyl halides

C. Aldehydes and ketones

D. Alkenes.

Answer: A

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71. Which of the following is not a nucleophile ?

A. $: CN^-$

B. ROH

C. BF_3

D. NH_3.

Answer: C

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72. The heterolytic cleavage of a carbon-chlorine bond produces :

A. Two free radicals

B. Two carbanions

C. Two carbonium ions

D. One cation and one anion.

Answer: D

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73. An electrophilic reagent is :

A. Electron deficient species

B. Electron rich species

C. Negatively charged species

D. A Lewis base.

Answer: A

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74. The negative inductive effect is shown by :

A. $-CH_3$

B. $-COOH$

C. $-CH_2CH_2$

D. $-CHR_2$.

Answer: B

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75. Which of the following substituents has $+M$ effect ?

A. $C \equiv N$

B. CHO

C. NH_2

D. NO_2

Answer: C

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76. The most stable free radical is :

A. $CH_3^{\bullet}$

B. $CH_3CH_2^{\bullet}$

C. $(CH_3)_2CH^{\bullet}$

D. $(CH_3)_3C^{\bullet}$.

Answer: D

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77. Which of the following is an allyl group ?

A. $C_6H_5CH_2-$

B. $CH_3-CH=CH-$

C. $CH_2=CH-CH_2-$

D. $(CH_3)_2CHCH_2-$.

Answer: C

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78. Which of the following is neither a nucleophile nor an electrophile ?

A. H_2O

B. NO_2^+

C. SO_3

D. (C2H5)_4N+'

Answer: D

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79. Polarisation of electrons in acrolein may be written as :

A. $\overset{\delta-}{C}H_2 = CH - \overset{\delta+}{C}H = O$

B. $\overset{\delta-}{C}H_2 = CH - \overset{\delta+}{C}H = O$

C. $\overset{\delta+}{C}H_2 = CH - \overset{\delta-}{C}H = O$

D. $\overset{\delta-}{C}H_2 = CH - \overset{\delta+}{C}H = O$

Answer: C

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80. The least stable carbonium ion is

A. allylic carbonium ion

B. vinyl carbonium ion

C. benzylic carbonium ion

D. ethyl carbonium ion.

Answer: B

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81. Hypercojugation effect is also known as

A. Baker-Nathan effect

B. No -bond resonance

C. Both (A) and (B)

D. None of these.

Answer: C

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82. Electrophilic addition reactions proceed in two steps. The first step involves the addition of an electrophile. Name the type of intermediate reaction.

$H_3C - HC = CH_2 + H^+ \rightarrow ?$

A. 2° Carbonation

B. 1° Carbocation

C. 2° Carbocation

D. 1° Carbanion

Answer: C

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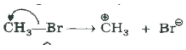
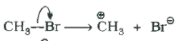
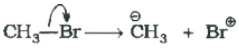
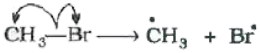
83. Covalent bond can undergo fission in two different ways. The correct representation involving a heterolytic fission of $CH_3 - Br$ is

A. 

B. 

C. 

D. 

Answer: B

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Multiple Choice Questions Level Ii

1. Which of the following compounds does not have only one type of hybrid carbon atoms ?

A. $HC \equiv C - C \equiv CH$

B. $CH_3CH_2 - CH_2 - CH_3$

C. $CH_3 - C \equiv C - CH_3$

D. $CH_2 = CH - CH = CH_2$.

Answer: C

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2. The incorrect IUPAC name of a compounds is 3,3-diethyl butane. The correct name is :

A. 3,3-Dimethyl haxzne

B. 1,1-Diethylmethyl pentane

C. 3-Ethyl-3-methylpentane

D. 3-Ethymethypentane.

Answer: C

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3. The formula of 3-bromo-2-methylbutanal is :

A. $CH_2BrCH_2(CH_3)CH_2CHO$

B. $CH_3CH_2BrCH(CH_3)CH_2OH$

C. $CH_3CH_2BrCH(CH_3)CHO$

D. $CH_3CH_2\mathrm{CH\ Br}CH(CH_3)CHO.$

Answer: C

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4. During the reaction,

$CH_3CONH_2 \xrightarrow{P_2O_5} CH_3CN.$

the hybridisation state of carbon changes from

A. sp^3 to sp

B. sp^3 to sp^2

C. sp^2 to sp^3

D. sp^2 to sp.

Answer: D

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5. 1,3-butadiene has :

A. only sp-hybridized C-atoms

B. only sp^3 hybridized C-atoms

C. only sp^2 hybridized carbon atoms

D. both sp^2 and sp^3 hybridized C-atoms.

Answer: C

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6. The $C - H$ bond distance is longest in

A. C_2H_6

B. $C_2H_2Br_2$

C. C_2H_4

D. C_2H_2.

Answer: A

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7. Which of the following statements is not correct ?

A. Carbanions behave as nucleophiles.

B. Allyl carbonium ion is more stable than vinyl carbonium ion.

C. Carbenes are neutral carbon intermediates having two non-bonded electrons.

D. A carbanion involves sp^2 hybridization of carbon atom.

Answer: D

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8. The first organic compound was prepared by

A. Lavoisier

B. Wohler

C. Kekule

D. Kolbe

Answer: B

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9. In the hydrogenation of the following reaction the state of carbon changes from :

$C_2H_2 \rightarrow C_2H_4 \rightarrow C_2H_6$

A. $sp - sp^2 - sp^3$

B. $sp^3 - sp^2 - sp$

C. $sp^2 - sp - sp^3$

D. $sp^3 - sp - sp^2$

Answer: A

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10. How many $\sigma -$ and $\pi -$ bonds are there in the molecule of tetracyanoethylene ?

A. Nine $\sigma -$ and nine $\pi -$ bonds

B. Five $\sigma -$ and nine $\pi -$ bonds

C. Nine $\sigma -$ and seven $\pi -$ bonds

D. Five $\sigma -$ and eight $\pi -$ bonds

Answer: A

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11. The compounds which gives the most stable carbonium ion on dehydration is :

A. $CH_3CH_2CH_2CH_2OH$

B. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{OH}{|}}{CH}CH_2CH_3$

C. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{CH_3}{|}}{C} - OH$

D. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2OH$

Answer: C

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12. Which one of the following IUPAC names is correct ?

A. 2-Methyl-3-ethyl pentane

B. 2-Ethyl-3-methyl pentane

C. 3-Ethyl-2-methyl pentane

D. 3-Methyl-2-ethyl pentane.

Answer: C

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13. The stability of the carbonium ion depends upon : A: the polarity of the group to which it is attached B: the inductive effect of the attached group

A. A is correct

B. B is correct

C. Both A & B are correct

D. none of these

Answer: C

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14. The correct IUPAC name of lactic acid is :

A. Propanoic acid

B. $\alpha -$ Hydrocy propionic acid

C. Carboxy propanal

D. 2-Hydroxy propanoic acid.

Answer: D

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15. The enolic form of Acetone contains :

A. 9 σ bonds, 1 π bonds and 2 lone pairs

B. 8 σ bonds, 2 π bonds and 2 lone pairs

C. 10 σ bonds, 1 π bonds and 1 lone pair

D. None is correct.

Answer: A

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16. The compound in which carbon uses sp^3 hydrid orbitals for bond formation is :

A. $HCOOH$

B. H_2NCONH_2

C. $(CH_3)_3COH$

D. $(CH_3)_3C - CHO$

Answer: C

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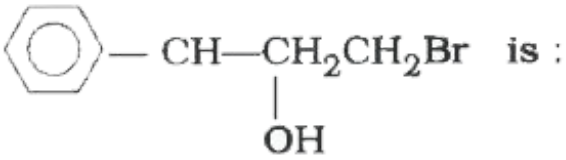
17. The IUPAC name of the compound



is :

A. 3-Bromo-1-phenyl-1-propanol

B. 1-Bromo-3-phenyl-propan-2-ol

C. 3-Bromo-1-hydroxy propyl benzene

D. 2-Bromo-1-phenyl propan-1-ol.

Answer: A

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18. The IUPAC name for :

$CH_3CH = CHCH_2\underset{\underset{NH_2}{|}}{C}HCH_2\,COOH$ is

A. 5-Amino-2-heptenoic acid

B. β-amino$-\delta-$ heptenoic acid

C. 5-Amino -hex-2-ene carboxylic acid.

D. 3-Amino-5-heptenoic acid.

Answer: D

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19. The hybridisation of C in diamond, graphite and ethyne is in the order

A. sp^3, sp^2, sp

B. sp, sp^3, sp^2

C. sp^2, sp, sp^3

D. sp, sp^2, sp^3.

Answer: A

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20. Which of the following contains acetic acid ?

A. Vinegar

B. Molasses

C. Coal tar

D. Butter.

Answer: A

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21. Anisole belongs to class of :

A. Ketones

B. Ethers

C. Amines

D. Alcohols.

Answer: B

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22. In which of the compounds given below is there more than one kind of hybridisation $\left(sp, sp^2, sp^3\right)$ for carbon ?

(i) $CH_3CH_2CH_2CH_3$

(ii) $CH_3 - CH = CH - CH_3$

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

(iv) $H - C \equiv C - H.$

A. (ii)

B. (iii) and (iv)

C. (i) and (iv)

D. (ii) and (iii)

Answer: D

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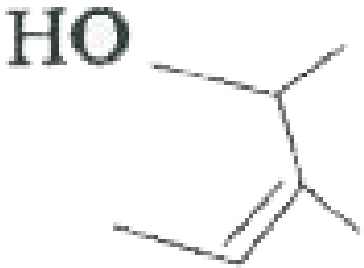
23. The IUPAC name of the compound



is :

A. 3-Methylpent-3-en-ol

B. 3,4-Dimethyl-2-buten-4-ol

C. 2,3-Dimenthyl-3-pentenol

D. 1,2-Dimethyl-but-2-en-1-ol

Answer: A

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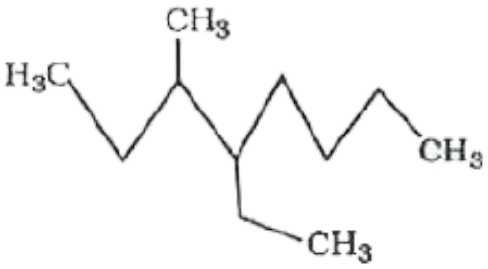
24. Name of the compound given below is :



A. 4-Ethyl-3-methyl octane

B. 3-Methyl-4-ethyl octane

C. 2,3-Diethyl heptane

D. 5-Ethyl-6-methyl octane.

Answer: A

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25. Names of some cpmpounde are given. Which one is not in IUPAC system :

A. $CH_3 - CH_2 - CH_2 - \underset{\displaystyle CH_2CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - CH - CH_2 - CH_3$

5-Methyl-4-ethylheptane

B. $CH_3 - \underset{\displaystyle OH}{\overset{|}{CH}} - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_3$

3-Methyl-2-butanol

C. $CH_3 - CH_2 - \underset{\displaystyle CH_2}{\overset{||}{C}} - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_3$

2-Ethyl-3-methyl-but-1-ene

D. $CH_3 - C \equiv C - CH(CH_3)_2.$

4-Methyl1-2-pentyne

Answer: A

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26. Which amongest the following is the most stable carbocation ?

A. $\overset{+}{C}H_3$

B. $CH_3\overset{+}{C}H_2$

C. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{CH_3}{|}}{CH}^+$

D. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{CH_3}{|}}{C}^+$

Answer: D

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27. The general formula which represents the homologous series of alkanols is :

A. $C_nH_{2n}O$

B. $C_nH_{2n+1}O$

C. $C_nH_{2n+2}O$

D. $C_nH_{2n}O_2$.

Answer: C

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28. The descending order of stability of the carbonium ions

$$\underset{(I)}{C_6H_5\overset{+}{C}H_2}, p-(CH_3O)\underset{(II)}{C_6H_4\overset{+}{C}H_2}, , p-(NO_2)\underset{(III)}{C_6H_4\overset{+}{C}H_2} \text{ and } p-(CH_3$$

is

A. $IV > II > I > III$

B. $II > IV > III > I$

C. $II > IV > I > III$

D. $IV > II > III > I.$

Answer: C

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29. Which of the following is the correct IUPAC name ?

A. 3-Ethyl-4, 4-dimethylheptane

B. 4,4-Dimethyl-2-ethylheptane

C. 5-Ethyl-4,4-dimenthylheptane

D. 4,4-Bis(methyl)-3-ethylheptane

Answer: A

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30. The IUPAC name for

A. 1-Chloro-2-nitro-4-methylbenzene

B. 1-Chloro-4-methyl-2-nitrobenzene

C. 2-Chloro-1-nitro-5-methylbenzene

D. m-Nitro-p-chlorotoluene

Answer: B

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31. Electronegativity of carbon atoms depends upon their state of hybridisation. In which of the following compounds, The carbon marked with asterisk is most electronegative ?

A. $CH_3 - CH_2 - {}^*CH_2 - CH_3$

B. $CH_3 - {}^*CH = CH - CH_3$

C. $CH_3 - CH_2 - C \equiv {}^*CH$

D. $CH_3 - CH_2 - CH = {}^*CH_2$

Answer: C

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32. What is the correct order of decreasing stability of the following cationas ?

$$\underset{I}{CH_3 - \overset{\oplus}{C}H - CH_3} \quad \underset{II}{CH_3 - \overset{\oplus}{C}H - OCH_3} \quad \underset{III}{CH_3 - \overset{\oplus}{C}H - CH_2 - OCH}$$

A. $II > I > III$

B. $II > III > I$

C. $III > I > II$

D. $I > II > III$

Answer: A

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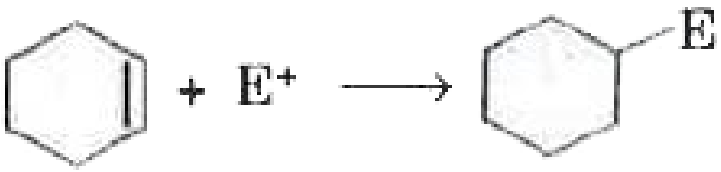
33. The reaction



represents

A. nucleophilic substitution

B. electrophilic addition

C. electrophilic substitution

D. elimination reaction

Answer: B

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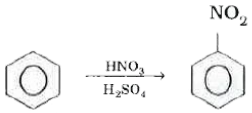
34. What of the following reaction represents α, γ elemination reaction ?

A. $CH_3CHO \xrightarrow{OH^-} CH_3\overset{\overset{OH}{|}}{C}HCH_2CHO$

B. $CH_3CH_2CH_2CH_2Br \xrightarrow{alc.KOH} CH_3CH_2CH = CH_2$

C. 

D. $BrH_2C - CH_2 - CH_2Br \xrightarrow{\text{Zn dust}} H_2C - CH_2$

Answer: D

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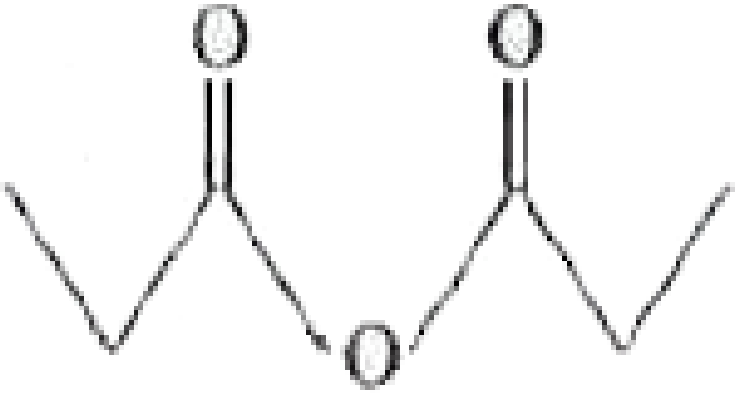
35. The IUPAC name of the following compound



A. Propionic anhydride

B. Dipropanoic anhydride

C. Ethoxypropanoic acid

D. Propanoic anhydride

Answer: D

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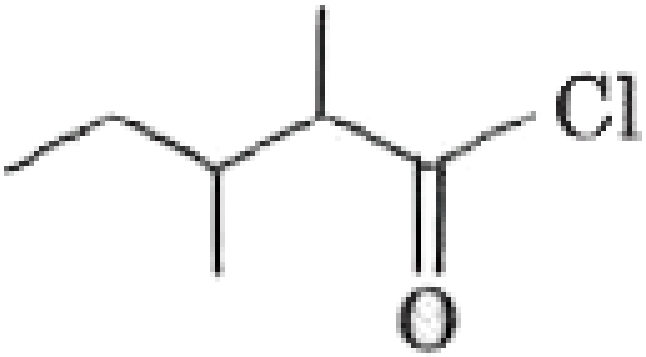
36. The IUPAC name of



A. 1-chloro-1-oxe-2,3-dimenthylpentane

B. 2-ethyl-3-methylbutanoyl chloride

C. 2,3-dimenthyl pentanoyl chloride

D. 3,4-dimethyl pentanoyl chloride.

Answer: C

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37. The IUPAC name of the following compound is

$$(CH_3)_2CH - CH_2CH = CH - CH = CH - \underset{\underset{C_2H_5}{|}}{C}HCH_3$$

A. 1,1,7,7-tetramethyl-2,5,-octadiene

B. 2,8-dimenthyl-3,6-decadiene

C. 1,5-di-iso-propyl-1,4-hexadiene

D. 2,8-dimethyl-4,6-decadiene

Answer: D

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38. Which of the following is a correct name according to IUPAC rules ?

A. 2,3-Diethylhexane

B. 3-Ethyl1-2-methylpentane

C. 3,4-Dimethylpentane

D. 2-Ethyl-2-methypentane

Answer: B

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39. The stablest radical among the following is

A. $C_6H_5CH_2 - \dot{C}H_2$

B. $CH_3C\dot{H}_2$

C. $C_6H_5 - \dot{C}H - CH_3$

D. $CH_3 - \dot{C}H - CH_3$

Answer: C

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40. Among the following carbocations :

(I) $Ph_2C^+CH_2Me$ (II) $PhCH_2CH_2CH^+Ph$

(III) Ph_2CHCH^+Me (IV) $Ph_2C(Me)CH_2^+$

The order of stability is

A. $IV > II > I > III$

B. $I > II > III > IV$

C. $II > I > IV > III$

D. $I > IV > III > II$

Answer: B

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41. The bond between carbon atoms 1 and 2 in the compound :

$N \equiv \overset{1}{C} - \overset{2}{C}H = CH_2$ involves the hybridised carbon as :

A. sp^2, sp

B. sp, sp^2

C. sp, sp^3

D. sp^2, sp^3

Answer: B

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42. Which of the following compounds has wrong name ?

A. $CH_3 - CH_2 - CH_2 - COO - CH_2CH_3$ Ethyl butanoate

B. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - CHO$ 3-Methylbutanal

C. $CH_3 - \underset{\underset{OH}{|}}{CH} - \underset{\underset{CH_3}{|}}{CH} - CH_3$ 2-Methyl-3-butanol

D. $CH_3 - \underset{\underset{CH_3}{|}}{CH} - \underset{\underset{O}{||}}{C} - CH_2 - CH_3$ 2-Methyl-3-pentanone

Answer: B

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43. The arrangement of

$(CH_3)_3C -$, $(CH_3)_2CH -$, $CH_3CH_2 -$

when attached to benzene or unsaturated group in increasing order of inductive effect is

A. $(CH_3)_3C - < (CH_3)_2CH - < CH_3CH_2 -$

B. $CH_3CH_2 \_ < (CH_3)_2CH - < (CH_3)_3C -$

C. $(CH_3)_2CH - < (CH_3)_3C - < CH_3CH_2 -$

D. $(CH_3)_3C - < CH_3CH_2 - < (CH_3)_2CH -$

Answer: A

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44. The reaction :

$(CH_3)_3CBr \xrightarrow{H_2O} (CH_3)_3COH$ is

A. elimination reaction

B. substitution reaction

C. free radical reaction

D. addition reaction.

Answer: B

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45. The IUPAC name of $CH_3COCH(CH_3)_2$ is :

A. 3-Methyl-2-butanone

B. Isopropyl methyl ketone

C. 2-Methyl-3-butanone

D. 4-Methyl isopropyl ketone.

Answer: A

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46. $C_nH_{2n}O_2$ is the general formula of

A. Carboxylic acids

B. diols

C. dialdehydes

D. diketones.

Answer: C

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47. Which of the following represents the given mode of hybridisation : $sp^2 - sp^2 - sp - sp$ from left to right ?

A. $H_2C = CH - C \equiv N$

B. $HC \equiv C - C \equiv CH$

C. $H_2C = C = C = CH_2$

D. 

Answer: A

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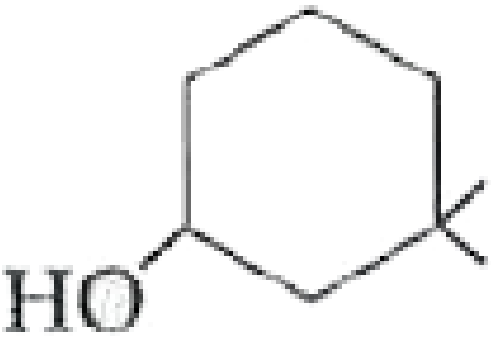
48. The IUPAC name of the compound



is :

is :

A. 3,3-Dimethyl cyclohexanol

B. 1,1-Dimethyl-3-hydroxycyclohexane

C. 3,3-Dimethyl-1-hydroxy xyxlohexane

D. 1,1-Dimethyl-3-cyclohexanol.

Answer: A

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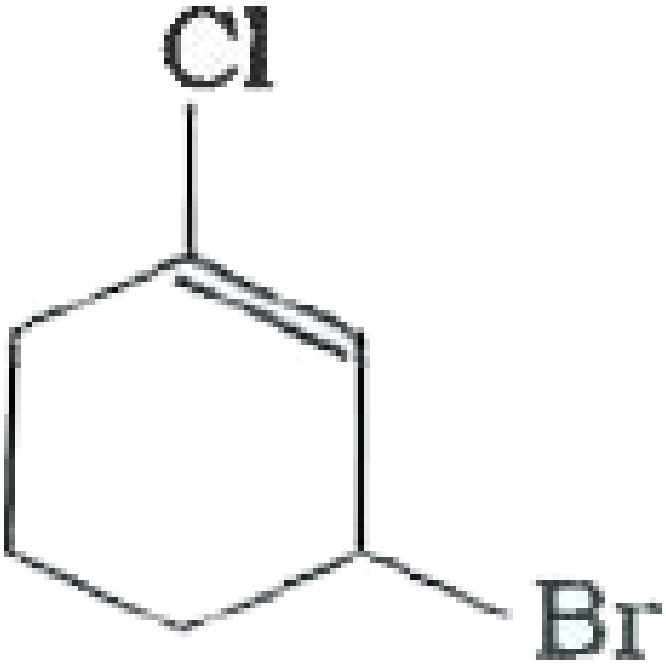
49. The IUPAC name of the compound shown be low is



A. 6-bromo-2-chloro cyclohexene

B. 3-bromo-1-chloro cyclohexene

C. 1-bromo-3-chloro cyclohexene

D. 2-bromo-6-chloro cyclohexene

Answer: B

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50. The increasing order of stability of the following free radicals is :

A. $(C_6H_5)_3\dot{C} < (C_6H_5)_2\dot{C}H < (CH_3)_3\dot{C} < (CH_3)_2\dot{C}H$

B. $(C_6H_5)_2\dot{C}H < (C_6H_5)_3\dot{C} < (CH_3)_3\dot{C} < (CH_3)_2\dot{C}H$

C. $(CH_3)_2\dot{C}H < (CH_3)_3\dot{C} < (C_6H_5)_3\dot{C} < (C_6H_5)_2\dot{C}H$

D. $(CH_3)_2\dot{C}H < (CH_3)_3\dot{C} < (C_6H_5)_2\dot{C}H < (C_6H_5)_3\dot{C}$

Answer: D

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51. The IUPAC name of C_6H_5COCl is :

A. Benzoyl chloride

B. Chlorophenyl ketone

C. Benzene carbonyl chloride

D. Phenyl chloroketone.

Answer: A

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52. The IUPAC name of

is :

A. 4,4-dimethyl-5,5-diethylpentane

B. 5,5-diethyl-4,4-dimethylpentane

C. 3-ethyl-4,4-dimenthylheptane

D. 1,1-diethyl-2-2dimethylpentane.

Answer: C

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Multiple Choice Questions Level Iii

1. The IUPAC name of neo-pentane is :

A. 2-Methylbutane

B. 2,2-Dimethylpropane

C. 2-Methylpropane

D. 2,2-Dimethylbutane.

Answer: B

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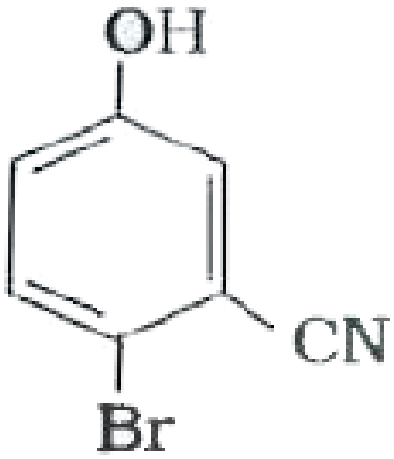
2. The IUPAC name of the following compound is :



A. 4-Bromo-3-cyanophenol

B. 2-Bromo-5-hydroxybenzonitrile

C. 2-Cyano-4-hydroxybromo benzene

D. 6-Bromo-3-hydroxybenzonitrile

Answer: B

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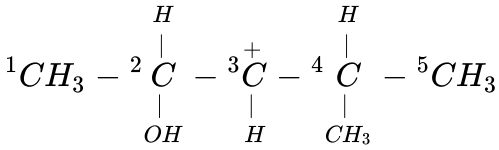
3. In the following carbocation, H/CH_3 that is most likely to migrate to the positively charged carbon is :



A. CH_3 at $C-4$

B. H at $C-4$

C. CH_3 at $C-2$

D. H at $C-2$.

Answer: D

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4. The correct order of stability of the following resonance structures is

(I) $H_2C=\overset{+}{N}=\overset{-}{N}$ (II) $H_2\overset{+}{C}-N=\overset{-}{N}$

(III) $H_2\overset{-}{C}-\overset{+}{N}\equiv N$ (IV) $H_2\overset{-}{C}N=\overset{+}{N}$

A. $I > II > IV > III$

B. $I > III > II > IV$

C. $II > I > III > IV$

D. $III > I > IV > II.$

Answer: B

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5. Consider thiol anion $\left(RS^{\Theta}\right)$ and alkoxy anion $\left(RO^{\Theta}\right)$. Which of the following statement is correct ?

A. $\left(RS^{\Theta}\right)$ is less basic but more nucleophilic than $\left(RO^{\Theta}\right)$

B. $\left(RS^{\Theta}\right)$ is more basic and more nucleophilic than $\left(RO^{\Theta}\right)$

C. $\left(RS^{\Theta}\right)$ is more basic but less nucleophilic than $\left(RO^{\Theta}\right)$

D. $\left(RS^{\Theta}\right)$ is less basic and less nucleophilic than $\left(RO^{\Theta}\right)$

Answer: A

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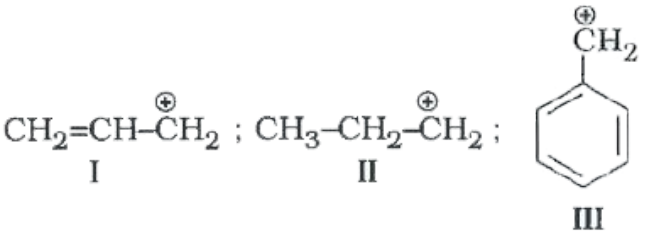
6. The order of stability of the following carbocations :



is

A. $II > II > I$

B. $II > III > I$

C. $I > II > III$

D. $III > I > II$

Answer: D

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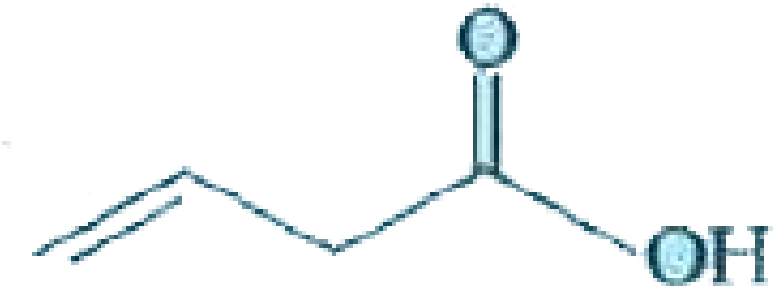
Recent Examination Questions

1. The IUPAC name of



is :

A. But-3-enoic acid

B. But-1-enoic acid

C. Pent-4-enoic acid

D. Prop-2-enoic acid.

Answer: A

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2. The maximum number of possible optical isomers in 1-bromo-2-methyl cyclobutane is :

A. 4

B. 2

C. 8

D. 16

Answer: A

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3. Which of these is not true regarding electromeric effect ?

A. It results in appearance of partial charges on the carbon atoms.

B. It is a temporary effect.

C. It operates on multiple bonds.

D. It requires an attacking reagent.

Answer: A

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4. The number of optical isomers of the compound, $CH_3 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{Br}{|}}{CH} - COOH$ is :

A. 0

B. 1

C. 3

D. 4

Answer: D

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5. Meso compounds do not show optica activity because :

A. they do not contain chiral carbon atoms

B. they have non-superimposable mirror images.

C. they contain plane of symmetry

D. they do not contain plane of symmetry.

Answer: C

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6. Acetone and propanal are :

A. Functional isomers

B. Position isomers

C. Geometrical isomers

D. Optical isomers.

Answer: A

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7. Mesomeric effect involves :

A. Delocalisation of π-electrons

B. Delocalisation of $\sigma -$ electrons

C. Partial displacement of electrons

D. Delocalisation of σ and π- electrons.

Answer: A

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8. Identify the correct IUPAC name of the compound :

$CH_3CH_2CH_2CH_2CN$

A. Butyl cyanide

B. Butanenitrile

C. Pentaneitrile

D. Pentyl cyanide.

Answer: C

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