CHEMISTRY

BOOKS - SAI CHEMISTRY (TELUGU ENGLISH)

ORGANIC CHEMISTRY -I

Mcq

1. The bond angle of  bond in methoxy methane is

A. 111.7°

B. 109°

C. 108.9°

D. 180°

Answer: A

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2. Which of the following reagent is used to find out carbon-carbon multiple bonds?

A. Grignard reagent

B. Bayer's reagent

C. Sandmayer's reagent

D. Gatterman reagent

Answer: B

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3. The two bonds N=O and N--O in H_3CNO_2 are of same bond length due to

A. Inductive effect

B. Hyperconjugation

C. Electromeric effect

D. Resonance effect

Answer: D

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4. Assertion (A) Reaction of 1 - butene with HBr gives 1 - bromobutane as major product.

Reason (R) Addtion of hydrogen halides to alkenes proceeds according to Markownikoff's rule.

The correct answer is

A. A) and (R) are correct, (R) is the correct explanation of(A)

B. (A) and (R) are correct but (R) is not the correct explanation of (A)

C. (A) is correct but (R) is not correct

D. (A) is not correct but (R) is correct

Answer: D

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5. The product (Z) of the following reaction is

A. 

B. 

C. 

D. 

Answer: B

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6. What are the shapes of ethyne and methane?

A. Square planar and linear

B. Tetrahedral and trigonal planar

C. Linear and tetrahedral

D. Trigonal planar and linear

Answer: C

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7. What is Z in the following reaction?

$$CH_3 - CH_2 - CO_2Na^+ \xrightarrow{\text{“}NaOH/CaO\text{”}} Z$$

A. Propane

B. n-butane

C. Ethane

D. Ethyne

Answer: C

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8. Which one of the following gives sooty flame on combustion?

A. C_2H_2

B. CH_4

C. C_2H_6

D. C_4H_6

Answer: D

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9. $C_2H_6 \xrightarrow{450^\circ C} C_2H_4 + H_2$

Above reaction is called as

A. Combustion

B. Rearrangement

C. Pyrolysis

D. Cleavage

Answer: C

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10. In which of the following properties, the two enantiomers of lactic acid differ from each other?

A. Sign of specific rotation

B. Density

C. Melting point

D. Refractive index

Answer: A

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11. Match the following

A. A-1,B_4,C-3,D-5

B. A-2,B-4,C-1,D-5

C. A-5,B-1,C-4,D-2

D. A-5,B-1,C-3,D-2

Answer: B

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12. Which of the following statements is not correct?

A. The six carbons in benzene are sp hybridised

B. Benzene has (4n+ 2) electrons

C. Benzene undergoes substitution reactions

D. Benzene has two carbon-carbon bond lengths,

Answer: D

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13. Different conformations of the same molecule are called

A. Isomers

B. Epimers

C. Enantiomers

D. Rotamers

Answer: D

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14. The chlorination of ethane is an example for which type of the following reactions?

A. Nucleophilic substitution

B. Electrophilic substitution

C. Free radical substitution

D. Rearrangement

Answer: C

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15. $C_6H_6 + O_3 \rightarrow X \xrightarrow{Zn\,/\,H_2O}$ 1 Y , X and Y are respectively

A. Diozonide, glycol

B. Triozonide, glyoxylic acid

C. Triozonide, glyoxal

D. Mono Ozonide, oxalic acid

Answer: C

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16. Which one of the following exhibits enantiomerism?

A. $BrCH_2 - CH_2 - CH_2 - CH_2Br$

B. $H_3C - \underset{\underset{Br}{|}}{CH} - CH_2 - CH_3$

C. $H_3C - CH_2 - CH_2 - CH_2Br$

D. $H_3C - CH_2 - CBr_2 - CH_3$

Answer: B

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17. Assertion (A) Cyclohexane is the most stable cycloalkane.

Reason (R) Cyclopropane and cyclobutane are less stable due to angle strain and torsional strain.

The correct answer is

A. Both (A) and (R) are true but (R) is not the correct explanation of (A)

B. (A) is true but (R) is not true

C. (A) is not true but (R) is true

D. Both (A) and (R) are true and (R) is the correct

Answer: A

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18. Diels - Alder reaction will not take place with which of the following reactants?

A. 

B. 

C. 

D. 

Answer: A

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19. In which of the following, ortho/para substitution by an electrophile is very facile?

A. Nitrobenzene

B. Phenol

C. Benzoic acid

D. Acetophenone

Answer: B

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20. Which one of the following of 2,3-butane diol is enantiomeric?

A. 2R, 3R and 2S, 3S

B. 2S, 3S and 2S, 3R

C. 2R, 3R and 2R, 3S

D. 2S, 3S and 2R, 3S

Answer: A

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21. The two enantiomers of secondary butyl chloride differ from each other in which one of the following properties?

A. Boiling point

B. Specific rotation

C. Density

D. CL-Cl bond length

Answer: B

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22. One mole of alkene X on ozonolysis gave one mole of acetaldehyde and one mole of acetone. The IUPAC name of Xis

A. 2-methyl-2-butene

B. 2-methyl-butene

C. 2-butene

D. 1-butene

Answer: A

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23. Identify the alkyne in the following sequence of reactions,

$$Alky \neq \xrightarrow[\text{Lindlar's catalyst}]{H_2} A \xrightarrow[\text{only}]{\text{Ozonolysis}} B$$

$$\xleftarrow[\text{process}]{\text{Wacker}} CH_2 = CH_2$$

A. $H_3C - C \equiv C - CH_3$

B. $H_3C - CH_2 - C \equiv CH$

C. $H_3C = CH - C \equiv CH$

D. $HC \equiv C - CH_2 - C \equiv CH$

Answer: A

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24. The concentration of an organic compound in chloroform is 6,15 g per 100 mL of solution. A portion of this solution in a 5 cm polarimeter tube causes an observed rotation of -1.2°. What is the specific rotation of the compound?

A. $+12^{\circ}$

B. -3.9°

C. -39°

D. $+61.5^{\circ}$

Answer: C

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25. Which of the following compound (s) has "Z"configuration?

A. (i) only

B. (ii) only

C. (iii) only

D. (i) and (iii)

Answer: D

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26. According to Cahn-Ingold-Prelog sequence rules, the correct order of priority for the given groups is

A.

$$-COOH > -CH_2OH > -OH > -CHO$$

B.

$$-COOH > -CHO > -CH_2OH > -OH$$

C.

$$-OH > -CH_2OH > -CHO > -COOH$$

D.

$$-OH - COOH > -CHO > -CH_2OH$$

Answer: D

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27. What are X and Y respectively in the following reaction?

$$Z - product \xleftarrow{Y} 2 - butyne \xrightarrow{X} E - product$$

A. $Na / NH_3(liq.)$ and $Pd / BaSO_4 + H_2$

B. $Ni / 140^\circ C$ and $Pd / BaSO_4 + H_2$

C. $Ni/140^{\circ}C$ and $Na/NH_3(liq.)$

D. $Pd/BaSO_4 + H_2$ and $Na/NH_2(liq.)$

Answer: A

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28. Identify 'B' in the following reaction

$$CH_2 = CH_2 + HCI \xrightarrow{Anhy.AICI_3} A + 2[H]$$

$$\xrightarrow[C_2H_5OH]{Zn-Cu} B + HCI$$

A. CH_4

B. C_2H_6

C. C_2H_2CI

D. C_2H_5OH

Answer: B

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29. The decreasing order of bond dissociation energies of C-C,C-H and H -H bonds is

A. H-Hgt-C-Hgt-C-C

B. -C-Crarr-C-HgtH-H

C. -C-Hgt-C-CrarrH-H

D. -C-CrarrH-Hgt-C-H

Answer: A

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30. The IUPAC name of the compound $(CH_3)_2, CH - CH = CH - CHOH - CH_3$ is

A. 5-methylhex -3-en-2-ol

B. 2-methylhex -3-en-5-ol

C. 2 - hydroxy-5-methyl-3-hexene

D. 5 - hydroxy-2-methyl-3-hexene

Answer: A

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31. Aqueous solution of an organic compound, Non electrolysis liberates actylene and CO_2 at anode. 'A' is

A. Potassium acetate

B. Potassium succinate

C. Potassium citrate

D. Potassium maleate

Answer: D

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32. A molecule (X) has (i) four sigma bonds formed by the overlap of sp and s orbitals (ii) one sigma bond formed by sp and sp orbitals and (iii) one bond formed by and p, orbitals. Which of the following is X?

A. C_2H_6

B. C_2H_3CI

C. $C_2H_2CI_2$

D. C_2H_4

Answer: D

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33. Which of the following reagents when heated with ethyl chloride, forms ethylene?

A. Aqueous KOH

B. Zn/HCI

C. Alcoholic KOH

D. HI

Answer: C

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34. The number of sigma and pi (TT) bonds present in benzene respectively are

A. 12,6

B. 6,6

C. 6,12

D. 12,3

Answer: D

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35. The chemicals and the reaction conditions required for the preparation of ethane are

A. $C_2H_51, Zn - Cu, C_3H_5OH$

B. CH_3CI, Na, H_2O

C. KOOC-CH=CH-COOK, electrolysis

D. $CH_3CO_2Na, NaOH, CaO, \Delta$

Answer: A

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36. Which of the following compounds is soluble in benzene but almost insoluble in water?

A. C_2H_5OH

B. CH_3CO_2H

C. CH_3CHO

D. $C_6H_5NO_2$

Answer: D

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37. Which of the following is a pair of functional isomers?

A. $CH_3COCH_3CH_3CHO$

B. $C_2H_5CO_2H, CH_3CO_2CH_3$

C. $C_2H_5CO_2H, HO_2\mathbb{C}_2H_5$

D. CH_3CO_2H, CH_3CHO

Answer: B

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38. The compound prepared by substitution reaction of benzene is

A. Acetophenone

B. Glyoxal

C. Cyclohexane

D. Hexabromo cyclohexane

Answer: A

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39. Match the following columns.

A. A-4,B-3,C-2,D-1

B. A-3,B-2,C-1,D-4

C. A-2,B-4,C-5,D-3

D. A-5,B-1,C-4,D-3

Answer: A

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40. The following reaction is an example of .... reaction.

$$C_2H_4Br_2 \xrightarrow{Alc.KOH} C_2H_2$$

A. Addition

B. Dehydrobromination

C. Substitution

D. Debromination

Answer: B

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41. Match the following columns

A. A-3,B-4,C-1,D-2

B. A-4,B-5,C-3,D-2

C. A-3,B-1,C-2,D-5

D. A-2,B-3,C-4,D-5

Answer: A

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42. An organic compound containing Cand H has 92.3% of carbon. Its empirical formula is

A. CH

B. CH_3

C. CH_2

D. CH_4

Answer: A

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43. What is the molecular formula of the product formed when benzene is reacted with ethyl chloride in presence of anhydrous aluminium chloride?

A. C_8H_{10}

B. C_6H_6

C. C_6H_8

D. C_6H_5CI

Answer: A

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44. When acetylene is passed through red hot iron tube, compound X is formed. Which one of the following reactions will yield X as the major product?

A. $C_6H_5OH + Zn \xrightarrow{Distillation}$

B. $C_6H_5SO_3H + NaHCO_3 \rightarrow$

C. $C_6H_{12} + 3H_2 \xrightarrow{Ni}$

D. $C_6H_5Cl + H_2O \xrightarrow{\Delta}$

Answer: A

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45. 2,3-dimethylhexane contains.....tertiary.....secondary and...primary carbons respectively.

A. 2,2,4

B. 2,4,3

C. 4,3,2

D. 3,2,4

Answer: A

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46. 4 g of a hydrocarbon on complete combustion gave 12.571 g of Co, and 5.143 g of water. What is the empirical formula of the hydrocarbon?

A. CH

B. CH_2

C. CH_3

D. C_2H_2

Answer: B

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47. What is the minimum quantity (in grams) of methyl iodide required for preparing one mole of ethane by Wurtz reaction?

A. 142

B. 568

C. 326

D. 284

Answer: D

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48. The reagent used for converting acetylene to oxalic acid is,

A. $HgSO_4 / aqueous H_2SO_4$

B. $HgSO_4 / CH_3COOH$

C. $KMnO_4 / KOH, 25^\circ C$

D. Cr_2O_3 / H_2SO_4

Answer: C

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49. The structural formula of 2-methyl-2-butene is

A. $CH_3 - CH(CH_3 - CH = CH_2$

B. $CH_3 - CH_2 - C(CH_3) = CH_2$

C. $CH_3 - CH = CH - CH_3$

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

Answer: D

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50. Which one of the following is used in the preparation of styrene?

A. CH_3CHO

B. P_2O_5

C. CH_4

D. C_6H_6

Answer: D

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51. How many litres of oxygen (at STP) are required for complete combustion of 39 g of liquid benzene? (Atomic weights:C=12,0=16,H=1)

A. 84

B. 22.4

C. 42

D. 11.2

Answer: A

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52. Which of the following reacts with ammoniacal cuprous chloride?

A. CH_4

B. C_2H_2

C. C_2H_6

D. C_6H_6

Answer: B

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53. Which of the following hydrocarbons has least carbon carbon bond length?

A. C_2H_6

B. C_2H_4

C. C_6H_6

D. C_2H_2

Answer: D

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54. Which of the following reacts with water to give ethane?

A. CH_4

B. C_2H_3MgBr

C. C_2H_5OH

D. $C_2H_5 - O - C_2H_5$

Answer: B

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55. The number of acetylene molecules required to form one molecule of benzene is

A. 1

B. 2

C. 3

D. 4

Answer: C

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56. The number of C-C sigma bonds present in 1-butyne is

A. 2

B. 3

C. 4

D. 5

Answer: B

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57. Which of the following alkanes cannot be prepared by Wurtz reaction?

A. C_2H_6

B. C_3H_6

C. CH_4

D. C_4H_{10}

Answer: C

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58. n-octane and n-nonane have

A. Same molecular formula

B. Same molecular weight

C. Similar chemical properties

D. Same boiling point

Answer: C

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59. A solid organic compound X, on heating, directly converted into the vapour phase which on cooling solidifies. The best method for purifying X is

A. Distillation

B. Distillation at reduced pressure

C. Sublimation

D. Steam distillation

Answer: C

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60. An organic compound having carbon and hydrogen, has 80% carbon. The empirical formula of the hydrocarbon

A. CH

B. CH_2

C. CH_3

D. CH_4

Answer: C

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61. A gas decolourises Br_2 in $\mathbb{C}I_4$ and forms a precipitate with ammoniacal silver nitrate. The gas is

A. C_2H_2

B. C_2H_4

C. C_2H_6

D. CH_4

Answer: A

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62. A mixture contains four solid organic compounds A,B,C,D. On heating, only C changes from solid to vapour state. C can be separated from the rest in the mixture by

A. Distillation

B. Sublimation

C. Fractional distillation

D. Crystallisation

Answer: B

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63. The homologue of ethyne is

A. C_2H_2

B. CH

C. C_3H_8

D. C_1H_4

Answer: D

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64. In Wurtz reaction, the reagent used is

A. Na

B. Na//Liq.NH_3

C. Na//dry ether

D. Na//dry ethanol

Answer: C

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65. Among the following compounds which have more than one type of hybridisation for carbon atoms.

A. $CH_3CH_2CH_2CH_3$

(a) 2 and 3

B. $CH_3.CH=CH.CH_3$

(b) 2

C. $CH_2=CH-CH=CH_2$

(c) 3 and 4

D. C-C=C-H

(d)3

Answer: B

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66. Hydrolysis of an ester gives a carboxylic acid which on Kolbe's electrolysis yields ethane. The ester is

A. Methyl Ethanoate

B. Methyl methanoate

C. Ethyl methanoate

D. Methylpropanoate

Answer: A

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67. Which of the following compounds does not form an ozonide?

A. Ethene

B. Propyne

C. Propene

D. Propane

Answer: D

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68. The alkane that yields two isomeric monobromo derivatives is

A. Neo - pentane

B. Ethane

C. Methane

D. Propanc

Answer: D

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69. The number of a bonds in the product formed by passing acetylene through dil H_2SO_4, containing mercuric sulphate is

A. Zero

B. One

C. Two

D. Three

Answer: B

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70. The molecular weight of an organic compound is 180. Its empirical formula is CH_2O. Its molecular formula is

A. $C_6H_{12}O_6$

B. $C_2H_{16}O_5$

C. $C_5H_4O_5$

D. $C_5H_8O_7$

Answer: A

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71. The number of isomeric structures possible for a molecule having molecular formula C_5H_{12} is

A. 2

B. 3

C. 4

D. 5

Answer: B

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72. Which one of the following compounds is most acidic?

A. CH_3Cl

B. CH_3OH

C. $H_2 = CH_2$

D. HC=CH

Answer: B

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73. Liquid benzene burns in oxygen according to $2C_6H_6(1) + 150_2(8) \rightarrow 12CO_2, (g) + 6H_2O(g).$ How many litres of oxygen are required for complete combustion of 39g of liquid C_6H_6 (atomic wt.of C=12, 016)?

A. 11.2

B. 22.4

C. 42

D. 84

Answer: D

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74. The compound formed when 2-butene is treated with acidified $KMnO_4$ is

A. Acetaldehyde

B. Acetic acid

C. $\begin{matrix} C & H_2OH \\ | & \\ CH_2OH & \end{matrix}$

D. $\begin{matrix} C & H_2 - CHOH \\ | & \\ CH_2 - CHOH & \end{matrix}$

Answer: B

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75. In the following reaction sequence,

$$CaC_2 \xrightarrow{H_2O} P \xrightarrow[\text{tube}]{\text{Hot iron}} Q \xrightarrow[AICI_3]{CH_3CI} R$$

A. Benzene

B. Toluene

C. Ethylbenzene

D. n-propyl benzene

Answer: B

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76. Benzene molecule contains

A. $3\pi -$ and $9\sigma - bonds$

B. $6\pi -$ and $12\sigma - bonds$

C. $6\pi -$ and $6\sigma - bonds$

D. $3\pi -$ and $12\sigma - bonds$

Answer: D

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77. Among the following, the hydrocarbon which decolourises bromine water but does not give precipitate with ammoniacal $AgNO_3$ is

A. CH_4

B. C_2H_4

C. C_2H_2

D. C_6H_6

Answer: B

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78. The method of converting high boiling hydrocatbons into low boiling hydrocarbons is known as

A. Pyrolysis

B. Isomerisation

C. Cracking

D. Inversion

Answer: B

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79. Which one of the following compounds is acidic?

A. C_6H_6

B. C_2H_6

C. C_2H_4

D. C_2H_{12}

Answer: D

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80. The hybridisation involved in acetylene is

A. sp

B. sp^2

C. sp^3

D. dsp^2

Answer: A

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81. The IUPAC name of the compound

$$CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{C} = CH_2,$$ is

A. 3-methylbutene

B. 2-methylbut - 1 -ene

C. 1-methylbut-1-ene

D. 2-methylbut-2-ene

Answer: B

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82. Dilute $KMnO_4$ oxidises acetylene to

A. Acetic acid

B. Carbon dioxide

C. Oxalic acid

D. Acetaldehyde

Answer: C

83. An organic compound has an empirical formula CH_2O. Its vapour density is 45. The molecular formula of compound is

A. CH_2O

B. C_2H_5O

C. $C_2H_4O_2$

D. $C_3H_6O_3$

Answer: D

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84. $CH_3 - CH_2 - CH - CH_2 - CH_2CH_3$

IUPAC name is

A. 2-ethylpentane

B. 4-methylhexane

C. 3-methylhexane

D. Methylhexane

Answer: C

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85. The number of a bonds, in ethylene molecule is

A. 4

B. 5

C. 6

D. 7

Answer: B

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86. Baeyer's reagent reacts with which of the following compounds to give glycol?

A. Methane

B. Ethane

C. Ethylene

D. Acetylene

Answer: C

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