13. Purification, Classification and Nomenclature of Organic Compounds – Multiple Choice Questions

1. Chemical Analysis of Organic Compounds

1. The purification of a organic compound is varified with

(a) Melting point (b) Molecular weight

(c) Density (d) Solubility in water

2. Chromatography is used for the purification of

(a) Solids (b) Liquids

(c) Gases (d) All of these

3. Which of the substance is purified by sublimation

(a) Benzoic acid (b) Camphor

(c) Naphthalene (d) All of these

4. The fragrance of flowers is due to the presence of some steam volatile organic compounds called essential oils. These are generally insoluble in water at room temperature but are miscible with water vapour in vapour phase. A suitable method for the extraction of these oils from the flowers is

(a) Distillation

(b) Crystallisation

(c) Distillation under reduced pressure

(d) Steam distillation

5. To differentiate between carbon-12, carbon-13 and carbon-14, the instrument that you would use is

(a) Infra-red spectrometer

(b) Atomic absorption spectrometer

(c) Mass spectrometer

(d) Ultraviolet spectrometer

6. How will you separate a solution (miscible) of benzene $+CHCl_3$

(a) Sublimation (b) Filtration

(c) Distillation (d) Crystallisation

7. A mixture of methyl alcohol and acetone can be separated by

(a) Distillation

(b) Fractional distillation

(c) Steam distillation

(d) Distillation under reduced pressure

8. Styrene can be purified by

(a) Simple distillation (b) Fractional distillation

(c) Steam distillation (d) Vacuum distillation

9. *p*-nitrophenol and *o*-nitrophenol are separated by

(a) Crystallisation (b) Fractional crystallisation

(c) Distillation (d) Steam distillation

10. A mixture of camphor and benzoic acid can be separated by

(a) Chemical method (b) Sublimation

(c) Fractional distillation (d) Extraction with a solvent

11. A mixture of $ZnCl_2$ and $PbCl_2$ can be separated by

(a) Distillation (b) Crystallization

(c) Sublimation (d) Adding acetic acid

12. During hearing of a court case, the judge suspected that some changes in the documents had been carried out. He asked the forensic department to check the ink used at two different places. According to you which technique can give the best results

(a) Column chromatography

(b) Solvent extraction

(c) Distillation

(d) Thin layer chromatography

13. The principle involved in paper chromatography is

(a) Adsorption (b) Partition

(c) Solubility (d) Volatility

14. The presence of halogen, in an organic compound, is detected by

(a) Iodoform test (b) Silver nitrate test

(c) Beilstein's test (d) Millon's test

15. In Lassaigne's test the organic compound is fused with *Na* followed by extraction with distilled water. Which of the following is not the possible product of this fusion reaction

(a) NaX (b) $NaCN$

(c) $NaNC$ (d) Na_2S

16. The reaction of nitroprusside anion with sulphide ion gives purple colouration due to the formation of

(a) The tetranionic complex of iron (II) coordinating to one NOS^- ion

(b) The dianionic complex of iron (II) coordinating to one NCS^- ion

(c) The trianionic complex of iron (III) coordinating to one NOS^- ion

(d) The tetranionic complex of iron (III) coordinating to one NCS^- ion

17. In Kjeldahl's method, $CuSO_4$ acts as

(a) Oxidising agent (b) Reducing agent

(c) Hydrolysing agent (d) Catalytic agent

18. In Kjeldahl's method, the nitrogen present in the organic compound is quantitatively converted into

(a) Gaseous ammonia

(b) Ammonium sulphate

(c) Ammonium phosphate

(d) Ammonia

19. 0.2595*g* of an organic substance in a quantitative analysis yielded 0.35 *g* of the barium sulphate. The percentage of sulphur in the substance is

(a) 18.52 *g* (b) 182.2 *g*

(c) 17. 5 *g* (d) 175.2 *g*

20. When 32.25*g* ethyl chloride dehydrohalogenated, it gives 50% alkene, what is the mass of product. (Atomic mass of chlorine = 35.5)

(a) 14 *g* (b) 28 *g*

(c) 64.5 *g* (d) 56 *g*

(e) 7 *g*

21. A compound containing only carbon, hydrogen and oxygen has a molecular weight of 44.0. On complete oxidation it is converted into a compound of molecular weight of 60.0. The compound is

(a) An aldehyde (b) An acid

(c) An alcohol (d) An ether

22. A compound of carbon, hydrogen and nitrogen contains three elements in the respective ratio of 9 : 1 : 3.5 *grams*. The Empirical formula of the compound is

(a) C_2H_4N (b) C_3H_4N

(c) C_3H_6N (d) C_2H_6N

23. 0.30 g of an organic compound containing C , H and Oxygen on combustion yields 0.44 g CO_2 and 0.18 g of H_2O . If one mole of compound weighs 60, then molecular formula of the compound is

(a) C_4H_6O (b) CH_2O

(c) $C_2H_4O_2$ (d) C_3H_8O

24. 116*mg* of a compound on vaporisation in a Victor Mayer's apparatus displaces 44.8*mL* of air measured at S.T.P. The molecular weight of the compound is

(a) 116 (b) 232

(c) 58 (d) 44.8

(e) 46.4

25. Accurate determination of atomic masses is done with the instrument called as

(a) Spectrophotometer

(b) Mass spectrometer

(c) Atomic absorption spectrometer

(d) Calorimeter

26. Insulin contains 3.4% sulphur. The minimum molecular weight of insulin is

(a) 350 (b) 470

(c) 560 (d) 940

27. In Victor Mayer's method 0.2 *g* of an organic substance displaced 56 *mL* of air at STP the molecular weight of the compound

(a) 56 (b) 112

(c) 80 (d) 28

28. A hydrocarbon contains 10.5 *gm* carbon and 1*gm* hydrogen. Its 2.4 *gm* has 1 *litre* volume at 1 *atm* and $127^\circ C$, hydrocarbon is

(a) C_6H_7 (b) C_6H_8

(c) C_5H_6 (d) None of these

29. An oxygen containing organic compound was found to contain 52% carbon and 13% of hydrogen. Its vapour density is 23. The compound reacts with sodium metal to liberate hydrogen. A functional isomer of this compound is

(a) Ethanol (b) Ethanal

(c) Methoxy methane (d) Methoxy ethane

2. Classification and Nomenclature of Organic Compounds

1. Cycloalkane has the formula

(a) C_nH_{2n+2} (b) C_nH_{2n-2}

(c) C_nH_{2n} (d) $C_{2n}H_2$

2. Nitrating mixture is

(a) Fuming nitric acid

(b) Mixture of conc. H_2SO_4 and conc. HNO_3

(c) Mixture of nitric acid and anhydrous zinc chloride

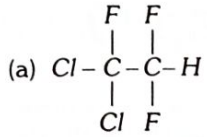
(d) None of these

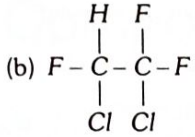
3. IUPAC name of the compound is $CH_3-CH=\underset{\displaystyle CH_2-CH_3}{\overset{\displaystyle |}{C}}-CH_3$

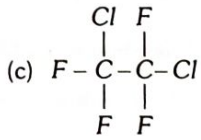
(a) 2-ethyl-2-butene (b) 3-ethyl-2-butene

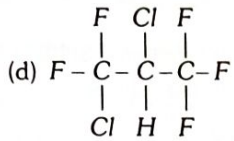
(c) 3-methyl-3-pentene (d) 3-methyl pent-2-ene

4. Freon-114 used in refrigerator and air conditioners is 1, 2-dichlorotetrafluoroethane. Its structural formula is

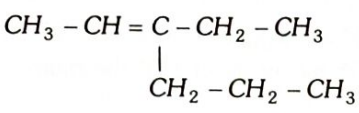
(a) 

(b) 

(c) 

(d) 

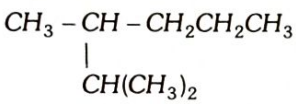
5. IUPAC name of the following compound will be



(a) 3-ethyl-2-hexene (b) 3-propyl-2-hexene

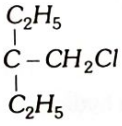
(c) 3-propyl-3-hexene (d) 4-ethyl-4-hexene

6. The IUPAC name of the following compound is



(a) 2-isopropylpentane (b) 2, 3-dimethylhexane

(c) Isononane (d) 2, 4-dimethylhexane

7. Which is the IUPAC name of 

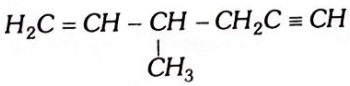
(a) 1-chloro-2, 2-diethylpropane

(b) 3-chloro-2, 2-diethylpropane

(c) 1-chloro-2-ethyl-2 methylbutane

(d) 1-chloro-2, 2-diethyl-2 methylethane

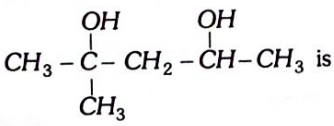
8. The correct IUPAC name of



(a) 3-methyl-1-hexen-5-yne (b) 4-methyl-5-hexen-1-yne

(c) 4-(ethenyl)-1-pentyne (d) 3-(2-propenyl) butene-1

9. The IUPAC name of

 is

(a) 4-methyl-2, 4, pentanediol

(b) 1, 1-dimethyl 1, 1, 3 butanediol

(c) 2-methyl-2, 4 pentanediol

(d) 1, 2, 3-trimethyl-1, 3 propanediol

10. The name of  according to IUPAC nomenclature system is

(a) 2,3 dibromo-1, 4-dichlorobutene-2

(b) 1, 4-dichloro-2, 3-bromobutene-2

(c) Dichlorodibromobutene

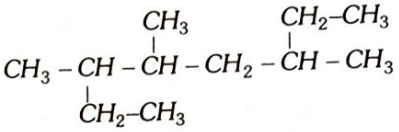
(d) Dichlorodibromobutane

11. IUPAC name of is

(a) Dimethyl amine (b) 2-aminopropane

(c) Isopropylamine (d) 2-propanamine

12. What will be the IUPAC name of the given compound



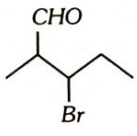
(a) 2, 5-diethyl - 4 - methylhexane

(b) 3, 4, 6-trimethyloctane

(c) 2, 5, 6-trimethyloctane

(d) 3, 5-dimethyl - 6 – ehtylheptane

13. The IUPAC name of

 is

(a) 2-methyl-3-bromohexanal

(b) 3-bromo-2-methylbutanal

(c) 2-methyl-3-bromobutanal

(d) 3-bromo-2-methylpentanal

14. How many methyl group are present in 2, 5-dimethyl-4-ethylheptane

(a) 2 (b) 3

(c) 4 (d) 5

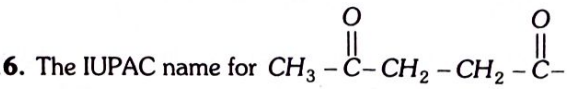
15. Which of the following is the correct IUPAC name

(a) 3-ethyl-4, 4-dimethylheptane

(b) 4,4-dimethyl-3-ethylheptane

(c) 5-ethyl-4, 4-dimethylheptane

(d) 4,4-bis(methyl)-3-ethylheptane

16. The IUPAC name for  is

(a) 1-hydroxypentane-1, 4-dione

(b) 1, 4-dioxypentanol

(c) 1-carboxybutan-3-one

(d) 4-oxopentanoic acid

17. Correct IUPAC name for $H_3C-\underset{\underset{C_2H_5}{|}}{CH}-\underset{\underset{C_2H_5}{|}}{CH}-CH_3$ is .....

(a) 2-ethyl-3-methylpentane (b) 3, 4-dimethylhexane

(c) 2-sec-butylbutane (d) 2, 3-dimethylbutane

18. What is the possible number of monohydroxy derivatives of a hydrocarbon consisting of five carbon atoms with one methyl group as a branch

(a) 2 (b) 3

(c) 4 (d) 5

19. Which one of the following contain isopropyl group

(a) 2,2,3,3-tetramethylpentane

(b) 2-methylpentane

(c) 2,2,3-trimethylpentane

(d) 3,3-dimethylpentane

20. IUPAC name of $CH_3-CH_2-\underset{\underset{CH_3}{|}}{CH}-NH_2$ is

(a) 1-methyl-1-aminopropane

(b) 2-aminobutane

(c) 2-methyl-3-aminopropane

(d) None of the above

21. IUPAC name of the compound is

$$CH_3CH_2CH_2CH_2CH_2-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{CH_2CH_2CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2CH_3$$

(a) 3, 4-dimethyl-3-n-propyl nonane

(b) 5, 7-dimethyl-7-n-propyl nonane

(c) 4-ethyl -4, 5-dimethyl decane

(d) 6, 7-dimethyl-7-ethyl decane

22. IUPAC name of tertiary butyl alcohol is

(a) Butan-1-ol (b) Butan-2-ol

(c) 2-methyl propan-1-ol (d) 2-methyl propan-2-ol

23. The IUPAC name of

$$CH_3-\underset{\underset{Cl}{|}}{C}=\underset{\underset{CH_3}{|}}{C}-\underset{\underset{C_2H_5}{|}}{CH}-CH_2-C\equiv CH$$ is

(a) 6-chloro-4-ethyl-5-methyl-hept-5-en-1-yne

(b) 6-chloro-4-ethyl-5-methyl-hept-1-yn-5-ene

(c) 2-chloro-4-ethyl-3-methyl-hept-2-en-6-yne

(d) 2-chloro-4-ethyl-3-methyl-hept-6-yn-2-ene

24. The IUPAC name of crotonaldehyde is

(a) Prop-2-ene-1-al (b) Propenal

(c) But-2-ene-1-al (d) Butenal

25. IUPAC name of $CH_3-\underset{\underset{C_2H_5}{|}}{\overset{\overset{H}{|}}{C}}-\underset{\underset{CH_3}{|}}{\overset{\overset{C_4H_9}{|}}{C}}-CH_3$ is

(a) 2-butyl-2-methyl-3-ethylbutane

(b) 2-ethyl-3, 3-dimethylheptane

(c) 3, 4, 4-trimethylheptane

(d) 3, 4, 4-trimethyloctane

26. The IUPAC name of the compound

$CHO-(CH_2)_4-COOH$

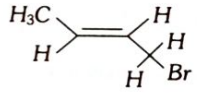
(a) Hexan-1-al-6-oic acid

(b) 6-formyl-hexanoic acid

(c) Hexanal-1-carboxylic acid

(d) Hexanoic acid 5-al-1

27. IUPAC name of the compound



is

(a) 1-bromobut-2-ene (b) 2-bromo-2-butene

(c) Bromobutene (d) 1-bromobut-3-ene

28. The IUPAC name of the molecule

$$CH_3-\overset{\overset{O}{||}}{C}-\underset{\underset{H_3C}{|}}{C}=\underset{\underset{CH_3}{|}}{C}-\overset{\overset{O}{||}}{C}-OH$$ is

(a) 4-oxo-2, 3-dimethylpent-2-en-1oic acid

(b) 2-carboxy-3-methylpent-2-en-3-one

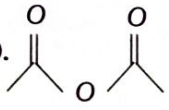
(c) 4-carboxy-3-methylpent-3-en-2-one

(d) 2, 3-dimethyl-4-oxo-pent-2-en-1-oic acid

29. The IUPAC name of acraldehyde is

(a) Prop-2-ene–1–al (b) Propenyl aldehyde

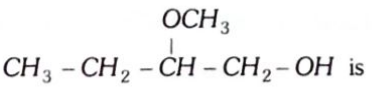
(c) But-2-ene–1–al (d) Propenal

30.  IUPAC name is

(a) 2, 4-butan-di-one (b) Ethanoic anhydride

(c) Ethoxy ethanone (d) Acetic anhydride

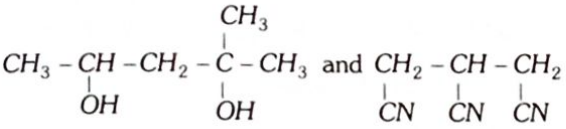
31. The IUPAC name of the compound



(a) 2-methoxy-1-butanol (b) 3-methoxy-1-butanol

(c) 2-methoxy-1-butanal (d) 1, 2-methoxy-butanol

32. The IUPAC name of

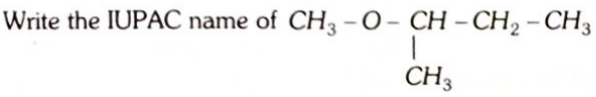


(a) 1, 1-dimethyl-1, 3-butanediol and propanetricarbyl amine

(b) 4-methyl-2, 4-pentanediol and 1, 2, 3 propanetrinitrile

(c) 2-methyl- 2, 4-pentanediol and propane 1, 2, 3-tricarbonitrile

(d) 1, 3, 3-trimethyl 1,3-propanediol and 1, 2, 3 tricyano propane

33. Write the IUPAC name of 

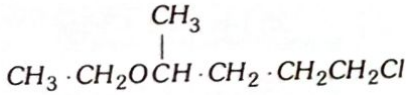
(a) 3-methoxy butane

(b) 2-methoxy butane

(c) 3-methyl-3-methoxy propane

(d) Butoxy methane

34. Give the correct IUPAC name of

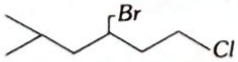


(a) 2-ethoxy-5-chloropentane

(b) 1-chloro-4-ethoxy-4-methylbutane

(c) 1-chloro-4-ethoxypentane

(d) Ethyl-1-chloropentylether

35. IUPAC name  is

(a) 1,1- dimethyl-3-bromoethyl-5-chloropentane

(b) 3-bromomethyl-1-chloro-5-methylhexane

(c) 1-bromomethyl-2-chloroethyl-4-methylpentane

(d) 4-bromomethyl-1-chloro-6-methylheptane

36. IUPAC name of $(CH_3)_2N-C_2H_5$ is

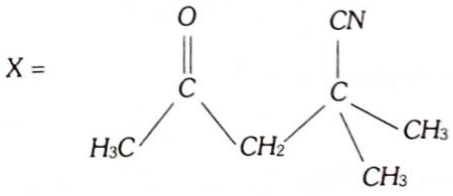
(a) Dimethyl ethyl amine

(b) Dimethyl amino methane

(c) Dimethyl amino ethane

(d) *N, N* - dimethyl amino ethane

37. The IUPAC name of the compound *X* is



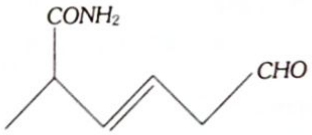
(a) 4-cyano-4-methyl-2-oxopentane

(b) 2-cyano-2-methyl-4-oxopentane

(c) 2,2-dimethyl-4-oxopentanenitrile

(d) 4-cyano-4-methyl-2-pentanone

38. The IUPAC name of the compound is



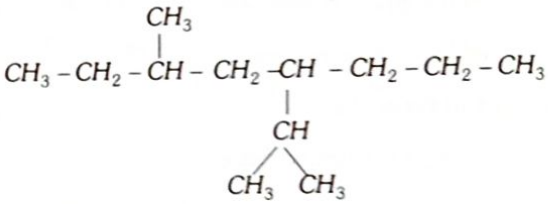
(a) 2-methyl-6-oxohex-3-enamide

(b) 6-keto-2-methyl hexamide

(c) 2-carbamoylhexanal

(d) 2-carbamoylhex-3-enal

39. IUPAC name of the compound



(a) 4-isopropyl 1-6-methyl octane

(b) 3-methyl-5-(1'-methylethyl) octane

(c) 3-methyl-5-isopropyl octane

(d) 6-methyl-4-(1'methylethyl) octane

40. The correct IUPAC name for

 is

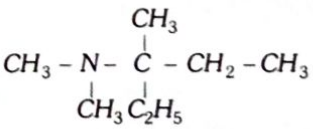
(a) Neononane

(b) Tetraethylmethane

(c) 3-ethyl pentane

(d) 3, 3-diethyl pentane

41. IUPAC name of the following are



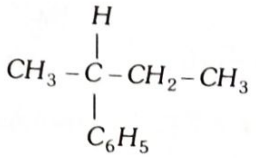
(a) 3-dimethylamino-3-methyl pentane

(b) 3 (*N, N*-trimethyl)-3-aminopentane

(c) 3, (*N, N*-trimethyl) pentanammine

(d) 3-*N, N*- dimethyl amino-3- methyl pentane

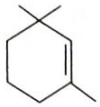
42. IUPAC name of the following compound is



(a) 2-cyclohexylbutane (b) 2-phenylbutane

(c) 3-cyclohexylbutane (d) 3-phenylbutane

43. Give the IUPAC name of the compound



(a) 1, 1, 3 – trimethylcyclohex – 2 – ene

(b) 1, 3, 3 – trimethylcyclohex – 1 – ene

(c) 1, 1, 5 – trimethylcyclohex – 5 – ene

(d) 2, 6, 6 – trimethylcyclohex – 1 – ene

44. The IUPAC name of Gammexane is

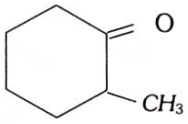
(a) Benzene hexachloride

(b) Hexachlorobenzene

(c) 1, 2, 3, 4, 5, 6, hexachlorobenzene

(d) 1, 2, 3, 4, 5, 6, hexachlorocyclohexane

45. IUPAC name for the compound



(a) α-methyl cyclohexanone

(b) 2-methyl cyclohexanone

(c) Heptanone-2

(d) Methyl cyclohexanone

46. Systematic name of $Ph - CH_2 - COOH$ is

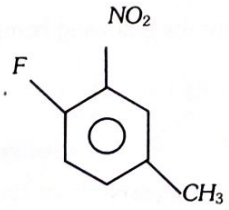
(a) Benzene acetic acid

(b) Phenylmethyl carboxylic acid

(c) 2-phenylethanoic acid

(d) 2-phenylmethanoic acid

47. IUPAC name of the compound is



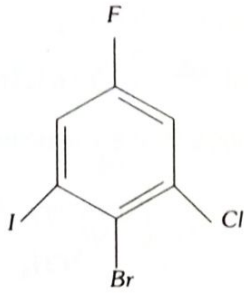
(a) 1-fluoro-4-methyl-2-nitrobenzene

(b) 4-fluoro-1-methyl-3-nitrobenzene

(c) 4-methyl-1-fluoro-2-nitrobenzene

(d) 2-fluoro-5-methyl-1-nitrobenzene

48. The IUPAC name of



is

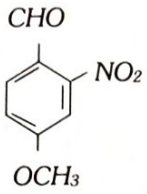
(a) 1-Bromo-2-chloro-3-fluoro-6-iodobenzene

(b) 2-Bromo-1-chloro-5-fluoro-3-iodobenzene

(c) 4-Bromo-2-chloro-5-iodo-1-fluorobenzene

(d) 2-Carbamoylhex-3-enal

49. What is the correct IUPAC name of



(a) 4-methoxy-2-nitrobenzaldehyde

(b) 4-formyl-3-nitro anisole

(c) 4-methoxy-6-nitrobenzaldehyde

(d) 2-formyl-5-methoxy nitrobenzene

50. The compound  is known by which of the following names

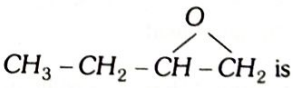
(a) Bicyclo-[2, 2, 2] octane

b) Bicyclo-[2, 2, 1] octane

(c) Bicyclo-[1, 2, 1] octane

(d) Bicyclo-[1, 1, 1] octane

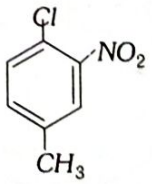
51. IUPAC name of the following compound



(a) 1, 2-epoxy butane (b) Ethyl methyl ether

(c) Keto pentanone (d) None of these

52. 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

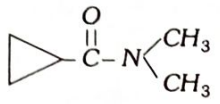
(d) m-nitro-p-chlorotoluene

53. IUPAC name of acetyl salicylic acid is

(a) *m*-benzoic acid (b) 2-acetoxy benzoic acid

(c) *p*-benzoic acid (d) *p*-acetyl benzoic acid

54. IUPAC name of the following compound



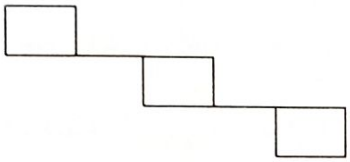
(a) *N*,*N*-dimethylcyclopropanecarboxamide

(b) *N*-methylcyclopropanamide

(c) Cyclopropanamide

(d) None of the above

55. The IUPAC name of compound



is

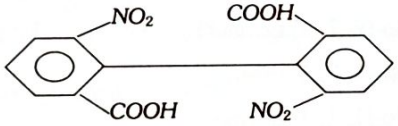
(a) 1, 3 - bis-cyclobutyl cyclobutane

(b) 1, 3 - dicyclobutyl cyclobutane

(c) 1, 1', 3', 1" - tricyclobutane

(d) 1, 1', 3', 1" – tercyclobutane

56. The IUPAC name of



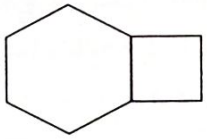
(a) 6, 6'-dinitrodiphenic acid

(b) 6, 6'-dinitrophenyl 2-2'-dicarboxylic acid

(c) 2, 2'-dinitrophenyl 6-6'-dicarboxylic acid

(d) 2, 2'-dinitrodiphenic acid

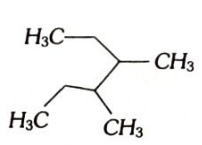
57. The name of the compound is



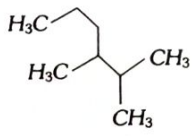
(a) Bicyclo [2.2.2] octane (b) Bicyclo [3.2.1] octane

(c) Bicyclo [4.1.1] octane (d) Bicyclo [4.2.0] octane

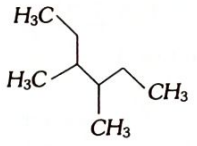
58. Among the following compounds



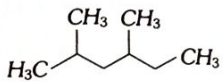
(i)



(ii)



(iii)



(iv)

2, 3–dimethylhexane is

(a) (i) (b) (ii)

(c) (iii) (d) (iv)

59. The molecule having a formyl group is

(a) Acetone (b) Acetaldehyde

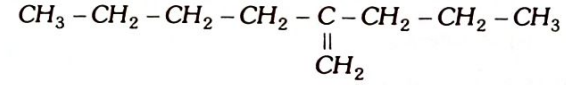
(c) Acetic acid (d) Acetic anhydride

60. The structure of *cis* – 3 – hexene is

(a)  (b) 

(c)  (d) 

61. The IUPAC name for the following compound is



(a) 2–propylhex –1-ene (b) 2–butylpent –1-ene

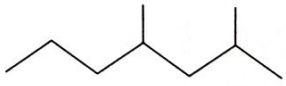
(c) 2–propyl –2–butylethene (d) Propyl–1–butylethene

62. The functional group present in a molecule having the formula $C_{12}O_9$ is

(a) Carboxylic acid (b) Anhydride

(c) Aldehyde (d) Alcohol

63. The IUPAC name for the following compound is



(a) 4, 6 – dimethylheptane

(b) 1, 3, 5 – trimethylhexane

(c) 2, 4 – dimethylheptane

(d) 2, 4, 6 – trimethylhexane

64. The IUPAC name for the following compound is

(a) 4, 6 – dimethylheptane (b) 1, 3, 5 –trimethylhexane

(c) 2, 4 – dimethylheptane (d) 2, 4, 6 –trimethylhexane

3. IIT-JEE/ AIEEE

1. The distillation technique most suited for separating glycerol from spent-lye in the soap industry is **[2016]**

(a) Fractional distillation

(b) Steam distillation

(c) Distillation under reduced pressure

(d) Simple distillation

2. An organic compound having molecular mass 60 is found to contain C = 20%, H= 6.67% and N=46.67% while rest is oxygen. On heating it gives NH_3 along with a solid residue. The solid residue gives violet colour with alkaline copper sulphate solution. The compound is **[2005]**

(a) CH_3NCO (b) CH_3CONH_2

(c) $(NH_2)_2CO$ (d) $CH_3CH_2CONH_2$

3. The compound formed in the positive test for nitrogen with the lassaigne solution of an organic compounds is **[2004; 2013]**

(a) $Fe(CN)_3$ (b) $Na_3[Fe(CN)_6]$

(c) $Fe_4[Fe(CN)_6]_3$ (d) $Na_4[Fe(CN)_5NOS]$

4. 29.5 mg of an organic compound containing nitrogen was digested according to Kjedahl's method and the evolved ammonia was absorbed in 20 mL of 0.1 M HCl solution. The excess of the acid required 15 mL of 0.1 M $NaOH$ solution for complete neutralization. The percentage of nitrogen in the compound is **[2010;]**

(a) 29.5 (b) 59.0

(c) 47.4 (d) 23.7

5. The ammonia evolved from the treatment of 0.30 g of an organic compound for the estimation of nitrogen was passed in 100 mL of 0.1 M sulphuric acid. The excess of acid required 20 mL of 0.5 M sodium hydroxide solution for complete neutralization. The organic compound is **[2004]**

(a) Urea (b) Benzamide

(c) Acetamide (d) Thiourea

6. For the estimation of nitrogen, 1.4 g of an organic compound was digested by Kjeldahl method and the evolved ammonia was absorbed in 60 mL of $\frac{M}{10}$ sulphuric acid. The unreacted acid required 20 mL of $\frac{M}{10}$ sodium hydroxide for complete neutralization. The percentage of nitrogen in the compound is **[2014]**

(a) 6% (b) 10%

(c) 3% (d) 5%

7. In Carius method of estimation of halogens, 250 mg of an organic compound gave 141 mg of $AgBr$. The percentage of bromine in the compound is (at. mass $Ag = 108; Br = 80$) **[2015]**

(a) 24 (b) 36

(c) 48 (d) 60

8. If two compounds have the same empirical formula but different molecular formulae they must have **[1987]**

(a) Different percentage composition

(b) Different molecular weight

(c) Same viscosity

(d) Same vapour density

9. An organic compound on analysis gave the following results : C = 54.5%, O = 36.4%, H = 9.1%. The Empirical formula of the compound is **[2004]**

(a) CH_3O (b) C_2H_4O

(c) C_3H_4O (d) C_4H_8O

10. A gaseous hydrocarbon gives upon combustion 0.72 g of water and 3.08 g. of CO_2. The empirical formula of the hydrocarbon is **[2013]**

(a) C_2H_4 (b) C_3H_4

(c) C_6H_5 (d) C_7H_8

11. At 300 K and 1 atm, 15 mL of a gaseous hydrocarbon requires 375 mL air containing 20% O_2 by volume for complete combustion. After combustion the gases occupy 330 mL. Assuming that the water formed is in liquid form and the volumes were measured at the same temperature and pressure, the formula of the hydrocarbon is **[2016]**

(a) C_2H_{12} (b) C_4H_8

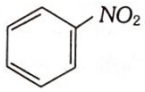
(c) C_4H_{10} (d) C_3H_6

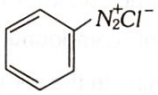
12. The ratio of mass percent of C and H of an organic compound $(C_XH_YO_Z)$ is $6:1$. If one molecule of the above compound $(C_XH_YO_Z)$ contains half as much oxygen as required to burn one molecule of compound C_XH_Y completely to CO_2 and H_2O. The empirical formula of compound $C_XH_YO_Z$ is **[2018]**

(a) $C_3H_4O_2$ (b) $C_2H_4O_3$

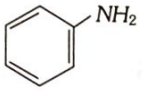
(c) $C_3H_6O_3$ (d) C_2H_4O

13. Which of the following compounds will be suitable for Kjeldahl's method for nitrogen estimation **[2018]**

(a) 

(b) 

(c) 

(d) 

14. IUPAC name of $CH_3-\underset{\underset{CH_2CH_3}{|}}{CH}-CHO$ is **[1993]**

(a) Butane-2-aldehyde

(b) 2-methylbutanal

(c) 3-methyl isobutyraldehyde

(d) 2-ethylpropanal

15. Which of the following compound have wrong IUPAC name **[2002]**

(a) $CH_3-CH_2-CH_2-COO-CH_2CH_3 \rightarrow$ ethyl butanoate

(b) $CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-CHO \rightarrow$3-methyl-butanal

(c) $CH_3-\underset{\underset{OH}{|}}{CH}-\underset{\underset{CH_3}{|}}{CH}-CH_3 \rightarrow$ 2-methyl-3-butanol

(d) $CH_3-\underset{\underset{CH_3}{|}}{CH}-\overset{\overset{O}{||}}{C}-CH_2-CH_3 \rightarrow$2-methyl-3 pentanone

16. The IUPAC name of $CH_3COCH(CH_3)_2$ is **[2003]**

(a) Isopropylmethyl ketone

(b) 2-methyl-3-butanone

(c) 4-methylisopropyl ketone

(d) 3-methyl-2-butanone

17. $Cl-C-Cl$ angle in 1, 1, 2, 2 - tetrachloroethene and tetrachloromethane respectively are about **[1988]**

(a) 120° and 109.5° (b) 90° and 109.5°

(c) 109.5° and 90° (d) 109.5° and 120°

18. The IUPAC name of succinic acid is **[1994]**

(a) 1, 4-butanedioic acid (b) Dimethyl-2-acid

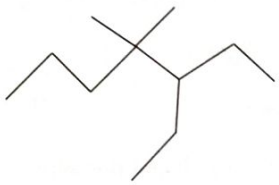
(c) 1, 2-dimethyldioic acid (d) None of these

19. The IUPAC name of neopentane is **[2009]**

(a) 2-methylbutane (b) 2, 2-dimethylpropane

(c) 2-methylpropane (d) 2, 2-dimethylbutane

20. The IUPAC name of



is **[2007]**

(a) 1, 1-diethyl-2, 2-dimethylpentane

(b) 4, 4-dimethyl-5, 5-diethylpentane

(c) 5, 5-diethyl-4, 4-dimethylpentane

(d) 3-ethyl-4, 4-dimethylheptane

21. The compound which has one isopropyl group is **[1989]**

(a) 2, 2, 3, 3-tetramethyl pentane

(b) 3, 3-dimethyl pentane

(c) 2, 2, 3-trimethyl pentane

(d) 2-methyl pentane

22. The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature is **[2008]**

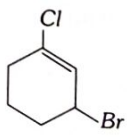
(a) $-SO_3H, -COOH, -CONH_2, -CHO$

(b) $-CHO, -COOH, -SO_3H, -CONH_2$

(c) $-CONH_2, -CHO, -SO_3H, -COOH$

(d) $-COOH, -SO_3H, -CONH_2, -CHO$

23. The IUPAC name of the compound shown below is



[2006]

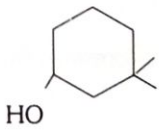
(a) 2-bromo-6-chlorocyclohex-1-ene

(b) 6-bromo-2-chlorocyclohexene

(c) 3-bromo-1-chlorocyclohexene

(d) 1-bromo-3-chlorocyclohexene

24. The IUPAC name of the compound is **[2004]**



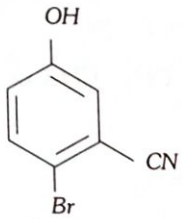
(a) 3, 3- dimethyl-1-cyclohexanol

(b) 1, 1-dimethyl-3-hydroxy cyclohexane

(c) 3, 3-dimethyl-1-hydroxy cyclohexane

(d) 1, 1-dimethyl-3-cyclohexanol

25. The IUPAC name of the following compound is



[2009]

(a) 4-bromo-3-cyanophenol

(b) 2-bromo-5-hydroxybenzonitrile

(c) 2-cyano-4-hydroxybromobenzene

(d) 6-bromo-3-hydroxybenzonitrile

26. The IUPAC name of C_6H_5COCl is **[2006]**

(a) Benzoyl chloride

(b) Benzene chloro ketone

(c) Benzene carbonyl chloride

(d) Chloro phenyl ketone

4. NEET/ AIPMT/ CBSE-PMT

1. The decomposition of organic compounds in the presence of oxygen and without formation of odoriferous substances, is called **[1999]**

(a) Decay (b) N_2 fixation

(c) Nitrification (d) Denitrification

2. The best method for the separation of naphthalene and benzoic acid from their mixture is **[2005]**

(a) Chromatography (b) Crystallisation

(c) Distillation (d) Sublimation

3. The Lassaigne's extract is boiled with conc. HNO_3 while testing for halogens. By doing so it **[2011]**

(a) Increase the concentration of NO_3^-

(b) Decomposes Na_2S and $NaCN$, if formed

(c) Helps in the precipitation of $AgCl$

(d) Increases the solubility product of $AgCl$

4. Lassaigne's test for the detection of nitrogen fails in **[1994]**

(a) $NH_2CONHNH_2.HCl$ (b) $NH_2NH_2.HCl$

(c) NH_2CONH_2 (d) $C_6H_5NHNH_2.HCl$

5. In Dumas's method of estimation of nitrogen 0.35 *g* of an organic compound gave 55 *mL* of nitrogen collected at 300*K* temperature and 715 *mm* pressure. The percentage composition of nitrogen in the compound would be

(Aqueous tension at 300 K = 15 *mm*)

[2011; 2015]

(a) 14.45 (b) 15.45

(c) 16.45 (d) 17.45

6. An organic compound containing *C*, *H* and *N* gave following analysis : C = 40%, H = 13.33% and N = 46.67%. Its Empirical formula would be **[1998, 99]**

(a) $C_2H_7N_2$ (b) CH_5N

(c) CH_4N (d) C_2H_7N

7. Camphor is often used in molecular mass determination because **[2004]**

(a) It is volatile

(b) It is a good solvent for organic substances

(c) It is readily available

(d) It has a very high cryoscopic constant

8. The general molecular formula, which represents the homologous series of alkanols is **[2006]**

(a) $C_nH_{2n+1}O$ (b) $C_nH_{2n+2}O$

(c) $C_nH_{2n}O_2$ (d) $C_nH_{2n}O$

9. IUPAC name of $CH_2 = CH - CH(CH_3)_2$ is **[1987; 1988]**

(a) 1, 1-dimethyl-2-propene (b) 3-methyl but-1-ene

(c) 2-vinyl propane (d) 1-isopropyl ethylene

10. 2-methyl but-2-ene will be represented as **[1992]**

(a) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - CH_3$

(b) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{C}} = CH - CH_3$

(c) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{C}} = CH_2$

(d) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH = CH_2$

11. The IUPAC name for

$$CH_3CH = CHCH_2\,\underset{\displaystyle NH_2}{\underset{|}{CHCH_2}}\,COOH$$ is **[1995]**

(a) 5-aminohex-2-ene carboxylic acid

(b) 5-amino-2-heptenoic acid

(c) 3-amino-5-heptenoic acid

(d) β – amino- δ – heptenoic acid

12. IUPAC name of $CH_3 - CH = CH - C \equiv CH$ is **[2010]**

(a) Pent-2-en-4-yne (b) Pent-3-en-1-yne

(c) Pent-3-yne-1-en (d) Pent-2-yne-1-en

13. The IUPAC name of the compound having the formula $CH \equiv C - CH = CH_2$ is **[2009]**

(a) 3 - butene - 1 - yne (b) 1 - butyn - 3 – ene

(c) But - 1 - yne - 3 - ene (d) 1 - butene - 3 – yne

14. The IUPAC name of the compound

$$CH_2 = CH - CH_2 - CH_2 - C \equiv CH \text{ is}$$

[2002;]

(a) 1, 5-hexenyne (b) 1-hexyne-5-ene

(c) 1, 5-hexynene (d) 1-hexene-5-yne

15. Names of some compounds are given. Which one is not in IUPAC system **[2005]**

(a) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_3$
3-Methyl-2-butanol

(b) $CH_3 - C \equiv C - CH(CH_3)_2$
4-Methyl-2-pentyne

(c) $CH_3 - CH_2 - \underset{\displaystyle CH_2}{\underset{||}{C}} - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$
2-Ethyl-3-methyl-but-1-ene

(d) $CH_3 - CH_2 - CH_2 - \underset{\displaystyle CH_2CH_3}{\underset{|}{CH}} - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2CH_3$
3-Methyl-4-ethyl heptane

16. Which nomenclature is not according to IUPAC system **[2012]**

(a) $Br - CH_2 - CH = CH_2$, 1–Bromo–prop–2–ene

(b) $CH_3 - CH_2 - \underset{\displaystyle Br}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}} - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}}\,CH_3$,

4–Bromo, 2, 4–di–methylhexane

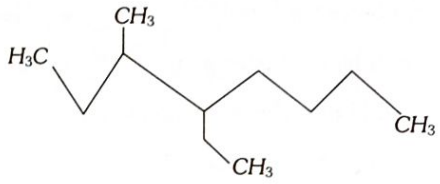
(c) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - \underset{\displaystyle \bigcirc}{\underset{|}{CH}} - CH_2 - CH_3$,

2–Methyl–3–phenylpentane

(d) $CH_3 - \underset{\displaystyle O}{\underset{||}{C}} - CH_2 - CH_2 - CH_2COOH$

5–Oxohexanoic acid

17. Name of the compound given below is



[2003]

(a) 5-ethyl-6-methyloctane

(b) 4-ethyl-3-methyloctane

(c) 3-methyl-4-ethyloctane

(d) 2, 3-diethylheptane

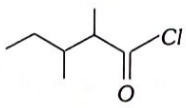
18. The IUPAC name of $CH_3 - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CHO$ will be **[1992]**

(a) 4-hydroxy-1-methylpentanal

(b) 4-hydroxy-2-methylpentanal

(c) 3-hydroxy-2-methylpentanal

(d) 3-hydroxy-3-methylpentanal

19. The IUPAC name of  **[2006]**

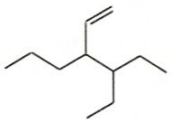
(a) 2-ethyl-3-methylbutanoyl chloride

(b) 2,3-dimethylpentanoyl chloride

(c) 3,4-dimethylpentanoyl chloride

(d) 1-chloro-1-oxo-2,3-dimethylpentane

20. The correct IUPAC name of the compound

 is

[2011]

(a) 3-(1-ethyl propyl) hex-1-ene

(b) 4-ethyl-3-propyl hex-1-ene

(c) 3-ethyl-4-ethenyl heptane

(d) 3-ethyl-4-propyl hex-5-ene

21. The structure of isobutyl group in an organic compound is

[2013]

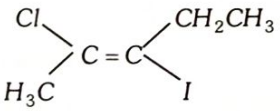
(a) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}}-$

(b) $\begin{matrix}CH_3\\CH_3\end{matrix}\!\!>\!CH-CH_2-$

(c) $CH_3-\underset{|}{CH}-CH_2-CH_3$

(d) $CH_3-CH_2-CH_2-CH_2-$

22. IUPAC name for the compound



[1998; 2011]

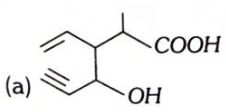
(a) *Trans* 3-iodo-4-chloro-3-pentene

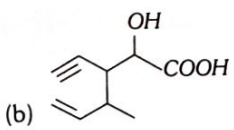
(b) *Cis* 3-chloro-3-iodo-2-pentene

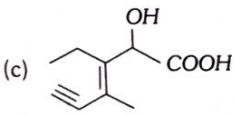
(c) *Trans* 2-chloro-3-iodo-2-pentene

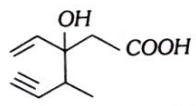
(d) *Cis* 3-iodo-4-chloro-3-pentene

23. Structure of the compound whose IUPAC name is 3–Ethyl–2–hydroxy–4–methylhex–3–en–5–ynoic acid is **[2013]**

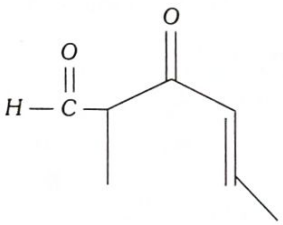
(a) 

(b) 

(c) 

(d) 

24. The IUPAC name of the compound is **[2017]**



(a) 3-keto-2-methylhex-4-enal

(b) 5-formylhex-2-en-3-one

(c) 5-methyl-4-oxohex-2-en-5-al

(d) 3-keto-2-methylhex-5-enal

5. AIIMS

1. Which of the following reagent is used for the separation of acetaldehyde from acetophenone **[2004]**

(a) NH_2OH (b) $NaOHI_2$

(c) $NaHSO_3$ (d) $C_6H_5NHNH_2$

2. Empirical formula of a compound is CH_2O and its vapour density is 30. Molecular formula of the compound is **[1998]**

(a) $C_3H_6O_3$ (b) $C_2H_4O_2$

(c) C_2H_4O (d) CH_2O

3. The empirical formula of compound is CH_2O. If its molecular weight is 180. The molecular formula of the compound is **[1999]**

(a) $C_3H_6O_3$ (b) $C_4H_8O_4$

(c) $C_6H_{12}O_6$ (d) $C_5H_{10}O_5$

4. If 0.228*g* of silver salt of dibasic acid gave a residue of 0.162*g* of silver on ignition then molecular weight of the acid is **[2015]**

(a) 70 (b) 80

(c) 90 (d) 100

5. The compound having only primary hydrogen atoms is **[2004]**

(a) Isobutene (b) 2,3-dimethylbutene

(c) Cyclohexane (d) Propyne

6. The IUPAC name of the compound

$CH_3-\underset{|}{\underset{\displaystyle OH}{C}}=CH-CH_2-COOH$ is **[1998]**

(a) Hydroxypentenoic acid

(b) 4-hydroxy-3-pentenoic acid

(c) 4-hydroxy-4-pentenoic acid

(d) 4-hydroxy-4-methyl-3-butenoic acid

7. IUPAC name of $(CH_3)_3C-CH=CH_2$ is **[1997]**

(a) 3,3,3-trimethyl-1-propene

(b) 1,1,1-trimethyl-2-propene

(c) 3,3-dimethyl-1-butene

(d) 2,2-dimethyl-3-butene

8. IUPAC name of $CH_3-\underset{CH_3}{\underset{|}{CH}}-CH_2-\underset{CN}{\underset{|}{CH}}-CH_3$ **[2002]**

(a) 2-cyano-3-methyl hexane

(b) 3-methyl-5-cyanohexane

(c) 2-4 dimethyl-cyanopentane

(d) 2-cyano-3-methylhexane

9. The correct structure of 4 -bromo-3-methyl but-1-ene is **[2008]**

(a) $Br-CH=C(CH_3)_2$

(b) $CH_2=CH-CH(CH_3)-CH_2Br$

(c) $CH_2=C(CH_3)CH_2CH_2Br$

(d) $CH_3-C(CH_3)=CHCH_2-Br$

10. The IUPAC name of

$$CH_3-\overset{CH_3}{\overset{|}{C}}-\overset{O}{\overset{||}{C}}-CH_2-CH_2OH$$ is **[2007]**

(a) 1– hydroxy –4–methyl pentan –3–one

(b) 2– methyl–5–hydroxy pentan– 3–one

(c) 4–methyl–3–oxopentan –1–ol

(d) Hexan–1–ol–3–one

11. The IUPAC name for $CH_3CHOHCH_2-\underset{CH_3}{\underset{|}{\overset{CH_3}{\overset{|}{C}}}}-OH$ is **[1992]**

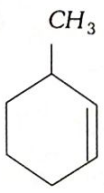
(a) 1, 1-dimethyl-1, 3-butanediol

(b) 2-methyl-2, 4-pentanediol

(c) 4-methyl-2, 4-pentanediol

(d) 1, 3, 3-trimethyl-1, 3-propanediol

12. IUPAC name of the following compound is **[2003]**



(a) 3-methyl cyclohexene (b) 1-methyl cyclohex-2-ene

(c) 6-methyl cyclohexene (d) 1-methyl cyclohex-5-ene

6. Assertion and Reason

Read the assertion and reason carefully to mark the correct option out of the options given below :

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

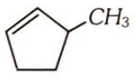
(e) If assertion is false but reason is true.

1. Assertion : Moving phase is liquid and stationary phase is solid in paper chromatography.

Reason : Paper chromatography is used for analysis of polar organic compounds.

2. Assertion : Potassium can be used in lassaigne test.

Reason : Potassium reacts vigorously. **[AIIMS 1997]**

3. Assertion : 

is 3-methyl cyclopentene.

Reason : In numbering, double bonded carbon atoms gets preference to the alkyl group in cycloalkenes.

4. Assertion : During test for nitrogen with Lassaigne extract on adding $FeCl_3$ solution sometimes a red precipitate is obtained.

Reason : Sulphur is also present. **[AIIMS 2001, 07, 15]**

5. Assertion : Magnetic Resonance Imaging (MRI) is a useful diagnostic tool for producing images of various parts of human body.

Reason : Protons of various tissues of the human body play a role in MRI. **[AIIMS 2006]**

6. Assertion : Oils are purified by steam distillation.

Reason : The compounds which decompose at their boiling points can purified by steam distillation. **[AIIMS 2008]**

13. Purification, Classification and Nomenclature of Organic Compounds – Answers Keys

1. Chemical Analysis of Organic Compounds

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

2. Classification and Nomenclature of Organic Compounds

1	c	2	b	3	d	4	c	5	a
6	b	7	c	8	a	9	c	10	a
11	b	12	b	13	d	14	d	15	a
16	d	17	b	18	c	19	b	20	b
21	c	22	d	23	c	24	c	25	d
26	b	27	a	28	d	29	a	30	b
31	a	32	c	33	b	34	a	35	b
36	d	37	c	38	a	39	b	40	d
41	d	42	b	43	b	44	c	45	b
46	c	47	a	48	b	49	a	50	a
51	a	52	b	53	b	54	a	55	d
56	b	57	d	58	b	59	b	60	c
61	a	62	b	63	c	64	a		

3. IIT-JEE/ AIEEE

1	c	2	c	3	c	4	d	5	a
6	b	7	a	8	b	9	b	10	d
11	a	12	b	13	d	14	b	15	c
16	d	17	a	18	a	19	b	20	d
21	d	22	a	23	c	24	a	25	b
26	c								

4. NEET/ AIPMT/ CBSE-PMT

1	a	2	b	3	b	4	b	5	c
6	c	7	a	8	b	9	b	10	b
11	c	12	a	13	d	14	d	15	d
16	a	17	b	18	b	19	b	20	b
21	b	22	c	23	c	24	a		

5. AIIMS

1	c	2	b	3	c	4	c	5	ad
6	b	7	c	8	c	9	b	10	a
11	b	12	a						

6. Assertion & Reason

1	e	2	e	3	a	4	a	5	a
6	c								