

**Bonding and hybridisation in organic compounds**

41. Which of the following hybridization is known as trigonal hybridization  
 (a)  $sp^3$  (b)  $sp$   
 (c)  $sp^2$  (d)  $dsp^2$
42. The types of hybridization present in 1, 2-butadiene are  
 (a)  $sp, sp^2$  and  $sp^3$  (b)  $sp^2$  and  $sp^3$   
 (c)  $sp^2$  and  $sp$  (d)  $sp$  and  $sp^3$
43. The  $C-H$  bond distance is longest in  
 (a)  $C_2H_2$  (b)  $C_2H_4$   
 (c)  $C_2H_6$  (d)  $C_6H_6$
44. Conjugated double bond is present in  
 (a) 1, 2-butadiene  
 (b) 1, 3-butadiene  
 (c) 1, 3-pentadiene  
 (d)  $\beta$ -butylene
45. In which of the following species is the underlined carbon having  $sp^3$  hybridisation  
 (a)  $CH_3\text{C}\underline{O}OH$   
 (b)  $CH_3\text{C}\underline{H}_2OH$   
 (c)  $CH_3\text{C}\underline{O}CH_3$   
 (d)  $CH_2 = \text{C}\underline{H} - CH_3$
46. The  $H-C-H$  bond angle in  $CH_4$  is  
 (a)  $109^\circ 28'$  (b)  $107^\circ 28'$   
 (c)  $90^\circ$  (d)  $180^\circ$
47. The hybridisation of carbons of  $C-C$  single bond of  $HC \equiv C - CH = CH_2$  is  
 (a)  $sp^3 - sp^3$  (b)  $sp - sp^2$   
 (c)  $sp^3 - sp$  (d)  $sp^2 - sp^3$
48. The shape of ethylene molecule is  
 (a) Square planar (b) Furan  
 (c) Trigonal planar (d) Tetrahedral
49. Acetylene molecule has carbon in  
 (a)  $sp$  - hybridisation  
 (b)  $sp^2$  - hybridisation  
 (c)  $sp^3$  - hybridisation  
 (d)  $sp^3d$  - hybridization
50. In the formation of methane molecule, carbon makes use of  
 (a)  $sp$  - hybridised orbitals  
 (b)  $sp^2$  - hybridised orbitals  
 (c)  $sp^3$  - hybridised orbitals  
 (d) Unhybridised orbitals
51. In graphite C-atom is in ....state  
 (a)  $sp^3$   
 (b)  $sp$   
 (c)  $sp^2$



- (d) None of these
52. How many  $\pi$ -bonds are present in naphthalene molecule  
 (a) 3 (b) 4  
 (c) 5 (d) 6
53. Hybridisation state of C in diamond is  
 (a)  $sp$  (b)  $sp^2$   
 (c)  $sp^3$  (d)  $sp^3d$
54. The number of  $\sigma$  and  $\pi$  bonds present in pent-4-ene, 1-yne is  
 (a) 10, 3 (b) 3, 10  
 (c) 4, 9 (d) 9, 4
55. Which one of the following is more acidic  
 (a) Butane (b) 1-butene  
 (c) 1-butyne (d) 2-butyne
56. Graphite is soft while diamond is hard because  
 (a) Graphite is in powder form  
 (b) Diamond has  $sp^2$  hybridization but graphite has  $sp^3$  hybridization  
 (c) Graphite is in planar form while diamond is in tetrahedral form  
 (d) Graphite is covalent and diamond is ionic
57. Hybridization of 1 and 2 carbon atoms in  
 $\overset{1}{CH_2} = \overset{2}{C} = CH_2$   
 (a)  $sp, sp$  (b)  $sp^2, sp^2$   
 (c)  $sp^2, sp$  (d)  $sp^3, sp^2$
58. Hydrogen bonding is maximum in  
 (a)  $C_2H_5OH$  (b)  $CH_3 - O - CH_3$   
 (c)  $(CH_3)_2C = O$  (d)  $CH_3CHO$
59. How many methyl group are present in 2, 5-dimethyl-4-ethylheptane  
 (a) 2 (b) 3  
 (c) 4 (d) 5
60. Which one of the following does not have  $sp^2$  hybridised carbon  
 (a) Acetonitrile  
 (b) Acetic acid  
 (c) Acetone  
 (d) Acetamide

