

## Bonding and hybridisation in organic compounds

- 21.** Which of the following statements is false for isopentane
- It has three  $CH_3$  groups
  - It has one  $CH_2$  group
  - It has one  $CH$  group
  - It has a carbon which is not bonded to hydrogen
- 22.** The number of  $\sigma$  bonds in o-xylene is
- 6
  - 9
  - 12
  - 18
- 23.** In benzene the total number of  $\sigma$  bonds is
- 3
  - 6
  - 9
  - 12
- 24.** The number of  $sp^3$  hybridized carbon atoms in cyclohexene are
- 2
  - 3
  - 4
  - 6
- 25.** The number of  $\pi$  bonds in 3-hexyne-1-ene is
- 1
  - 2
  - 3
  - 4
- 26.** Example of  $sp^2$  hybridization is
- $CH_3^+$
  - $CH_3$
  - $C_2H_5^+$
  - $C_2H_5$
- 27.** Select the molecule which has only one  $\pi$  – bond
- $CH \equiv CH$
  - $CH_2 = CHCHO$
  - $CH_3CH = CH_2$
  - $CH_3CH = CHCOOH$
- 28.** Carbon atoms in the compound  $(CN)_4C_2$  are
- $sp$  hybridized
  - $sp^2$  hybridized
  - $sp$  and  $sp^2$  hybridized
  - $sp$ ,  $sp^2$  and  $sp^3$  hybridized
- 29.** Acetylene molecules contain
- $5\sigma$  bond
  - $4\sigma$  bond and  $1\pi$  bond
  - $3\sigma$  and  $2\pi$
  - $3\sigma$  and  $3\pi$
- 30.** Number of unhybridised orbitals in vinyl acetylene are
- 2
  - 3
  - 4
  - 6



- 31.** Maximum bond energy of  $C-H$  bonds is found in the compound
- Ethane
  - Ethene
  - Ethyne
  - Equal in all the three
- 32.** Ethylene possess
- Two sigma and two pi bonds
  - Two pi bonds
  - Five sigma and one pi bond
  - Four sigma and one pi bond
- 33.** The hybridization involved in the six carbon atoms of benzene is
- $3sp^3, 3sp^2$
  - $3sp^3, 3sp$
  - All  $6sp$
  - All  $6sp^2$
- 34.** 1, 3-butadiene has
- $sp$  and  $sp^2$  hybridised C-atoms
  - $sp$ ,  $sp^2$  and  $sp^3$  hybridized C-atoms
  - Only  $sp^2$  hybridised C-atoms
  - Only  $sp$  hybridised C-atoms
- 35.** Which of the following  $C-H$  bond has the lowest bond dissociation energy
- Primary ( $1^\circ$ )  $C-H$  bond
  - Secondary ( $2^\circ$ )  $C-H$  bond
  - Tertiary ( $3^\circ$ )  $C-H$  bond
- 36.** Number of  $\sigma$  and  $\pi$  bonds present in 1- butene-3-yne respectively are
- $7\sigma, 3\pi$
  - $5\sigma, 2\pi$
  - $8\sigma, 3\pi$
  - $6\sigma, 2\pi$
- 37.** Which is an acidic hydrocarbon
- $CH_3CH_2CH_2CH_3$
  - $CH_3C \equiv CCH_3$
  - $CH_3C \equiv CH$
  - $CH_2 = CH - CH = CH_2$
- 38.** A carbon-carbon triple bond in ethyne ( $-C \equiv C-$ ) consists of
- All  $\sigma$  bonds
  - Two  $\sigma$  bonds and one  $\pi$  -bond
  - One  $\sigma$  bond and two  $\pi$  bonds
  - All  $\pi$  bonds
- 39.** Toluene has
- $6\sigma$  and  $3\pi$  bond
  - $9\sigma$  and  $3\pi$  bond
  - $9\sigma$  and  $6\pi$  bond
  - $15\sigma$  and  $3\pi$  bond
- 40.** In compound X, all the bond angles are exactly  $109^\circ 28'$ . X is
- Chloroform
  - Carbon tetrachloride



- (c) Chloromethane
- (d) Iodoform

