16.(A) Order of stability of free radicals

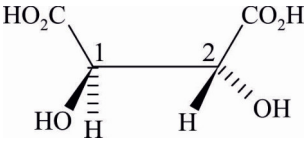
$(C_6H_5)_3\dot{C}$ > $(C_6H_5)_2\dot{C}H$ > $(CH_3)_3\dot{C}$ > $(CH_3)_2\dot{C}H$

Resonance stabilized | Resonance stabilized | Stabilized by inductive & hyper conjugation effect | Stabilized by inductive & hyper conjugation effect

17.(C) Gauche form is most stable due to intramolecular H-bond

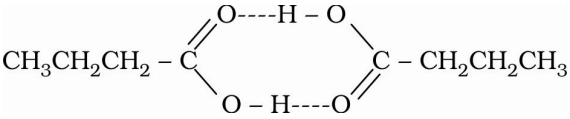
18.(A) The plane of polarized light is rotated by optically active compound, i.e. it should be chiral. So, (A) has, chiral C-atom. So, it is optically active. In (B), (C) and (D) plane of symmetry is present. Hence, (A) is correct.

19.(B)



Both C_1 and C_2 have R-configuration.

20.(B)



more extent of H-bonding due to dimeric structure

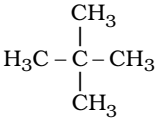
$CH_3CH_2CH_2CH_2OH$ (H-bonding)

$CH_3CH_2CH_2CHO$ (dipole – dipole inter molecular forces).

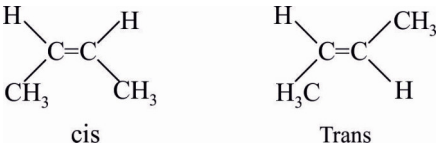
Order of boiling point 3 > 1 > 2

21.(A) –COOH, – SO_3H, – $CONH_2$, –CHO

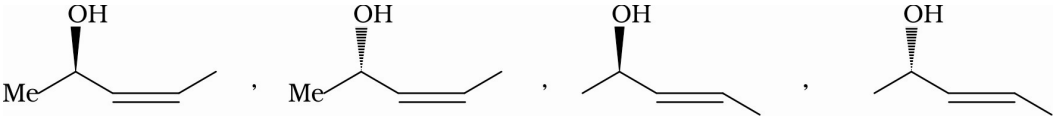
22.(B) Neopentane is



23.(C)



24.(A) About the double bond, two geometrical isomers are possible and the compound is having one chiral carbon.



25.(B) More π bonds lead to more stability

(I) is most stable due to complete octet and negative charge on more electronegative atom.

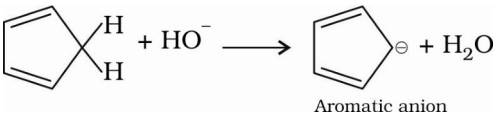
(IV) is least stable due to positive charge on electron deficient and more electronegative atom.

(II) is less stable due to incomplete octet and positive charge on electron deficient atom.

Order of stability is (I) > (III) > (II) > (IV)

26.(C) 2°carbanion is more stable than 3° and Cl is $-I$ effect group.

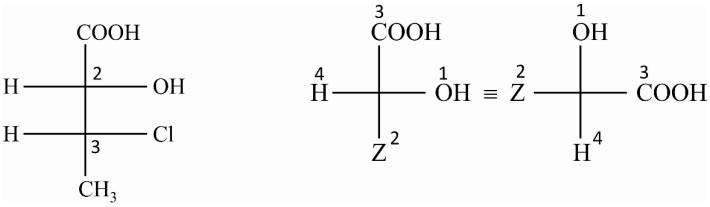
27.(C) Because cyclopetadiene acts as an acid due to the formation of stable, aromatic conjugate base.



Aromatic anion

28.(A) Order of priority of substituents of C-2 is OH > CH(Cl)(CH_3) > COOH

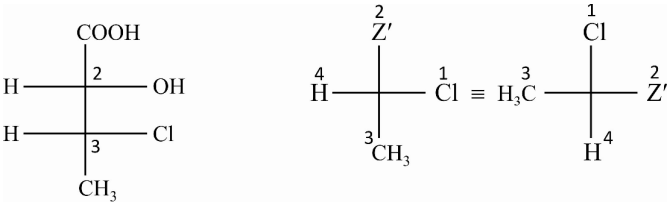
(Z)



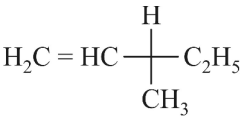
Order of priority is in anti-clockwise direction hence, its configuration is S.

Order of priority of substituents of C-3 is Cl > CH(OH)COOH > CH_3

(Z′)



Order of priority is in clockwise direction hence, its configuration is R.

29.(C) 

only 3-methyl-1-pentene has a chiral carbon

30.(B) Same percentage composition results in same empirical formula. Different molecular formula but same empirical formula means different molecular weight.

Molecular formula = (empirical formula) n

$$n = \frac{\text{Molecular weight}}{\text{empirical formula weight}}$$