

N.A



BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – B.Sc.(BT)-Hons-2018/B.Sc.(BT)-Hons-2020/B.Sc.(BT)-Hons-2021

Course Name – General Chemistry

Course Code - BBT303/BBTC303

(Semester III)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

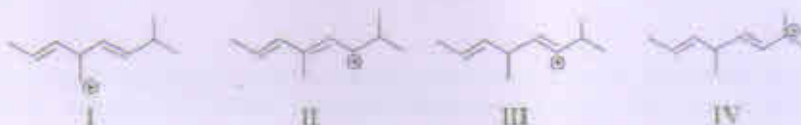
Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

(i) Which carbocation is the most stable among I, II, III and IV?



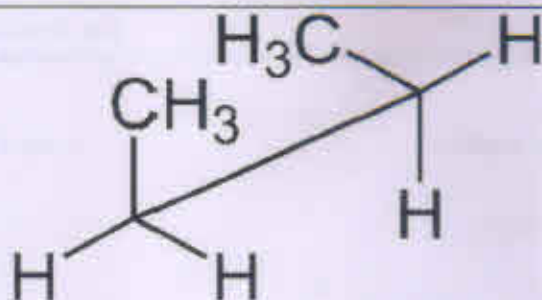
- | | |
|--------|-------|
| a) I | b) II |
| c) III | d) IV |
- (ii) Cyclopropenyl anion is an example of _____ molecule.
- | | |
|------------------|------------------|
| a) aromatic | b) non aromatic |
| c) anti-aromatic | d) homo aromatic |
- (iii) Resonance stabilized carbanion is what hybridized
- | | |
|-----------|------------|
| a) sp^3 | b) sp |
| c) sp^2 | d) sp^3d |
- (iv) Which one of the following is the correct bond angle between atoms adopting a trigonal planar geometry?
- | | |
|----------------|------------------|
| a) 180° | b) 109.5° |
| c) 90° | d) 120° |
- (v) Configuration means the relative arrangement of atoms in
- | | |
|-------|-----------------|
| a) 2D | b) 3D |
| c) 1D | d) All of these |
- (vi) Which is the most stable form of n-butane?
- | | |
|-------------|-----------------------|
| a) Gauche | b) Staggered |
| c) Eclipsed | d) Partially eclipsed |
- (vii) Let there be four groups COOH, D, H and CONH₂ attached to the chiral carbon, which one will have highest priority sequence
- | | |
|------|----------------------|
| a) D | b) CONH ₂ |
| c) H | d) COOH |
- (viii) Cis 2-butene and trans 2-Butene are
- | | |
|--|---------------------|
| a) configurational isomers | b) diastereoisomers |
| c) both configurational isomers and diastereoisomers | d) optical isomers |
- (ix) The solubility of silver halides in polar solvent (water) follows the order
- | | |
|---------------------------------------|---------------------------------------|
| a) $AgI > AgBr > AgCl > AgF$ | b) $AgF > AgCl > AgBr > AgI$ |
| c) $AgF < AgCl > AgBr > AgI < AgCl >$ | d) $AgF > AgCl < AgBr > AgI < AgBr >$ |
- (x) Bond order of Li₂ is
- | | |
|--------|--------|
| a) 1 | b) 0.5 |
| c) 1.5 | d) 0 |
- (xi) The bond angle of H₂O with respect to F₂O is
- | | |
|------------|--|
| a) greater | b) lesser |
| c) same | d) either greater or lesser depending upon situation |

- (xii) Which of the following compounds is a meso compound?
- a) (2R,3R)-dibromobutane
b) (2R,3S)-dibromobutane
c) (2R,3S)-3-bromo-2-butanol
d) (2R,3R)-3-bromo-2-butanol
- (xiii) Which of the following compounds can exhibit geometrical isomerism?
- a) 1-Hexene
b) 2-Methyl-2-Pentene
c) 3-methyl-1-pentene
d) 2-Hexene
- (xiv) In case of Carbohydrate which chiral carbon is taken to assign D, L nomenclature
- a) first
b) last
c) both first and last
d) second
- (xv) Which of the following is the greenest solvent?
- a) formaldehyde
b) benzene
c) ethanol
d) water

Group-B
(Short Answer Type Questions)

3 x 5=15

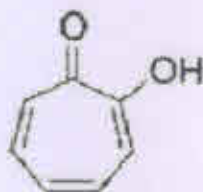
2. _____ (3)



Convert the following molecule into Newmann projection formulae.

3. How glycerol can act as a potential feedstock? (3)

4. (3)



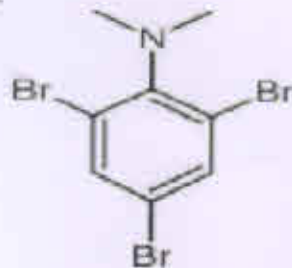
This molecule is extremely stable..... Explain

5. Though the hybridization of H_2O , NH_3 and CCl_4 is same but they have different bond angle. Explain it. (3)

OR

Bond order of N_2^+ is lower than that of N_2 . Explain why? (3)

6.



(3)

The above molecule is liquid at ordinary condition..... Explain.

OR

Arrange the following compounds in increasing order of their Melting Points with explanation. NaF, NaCl, NaBr and NaI.

(3)

Group-C

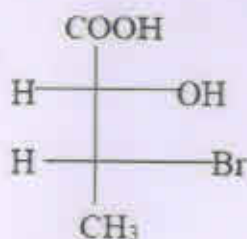
(Long Answer Type Questions)

5 x 6=30

7. pK_{a2} of maleic acid is greater than fumaric acid but pK_{a1} of fumaric acid is greater than maleic acid. Explain why? (5)
8. Calculate the lattice energy of NaCl crystal from the following data by using Born-Haber Cycle: (5)
for Na (s), $\Delta H_{sub} = 108.7$ kJ/mol, bond dissociation energy for $Cl_2 = 225.9$ kJ/mol, 1st ionization energy for Na = 489.5 kJ/mol, 1st electron gain enthalpy for Cl = -351.4 kJ/mol, Enthalpy of formation (ΔH_f) = -414.2 kJ/mol.
9. Draw the molecular energy level diagram for O_2 molecule and predict its magnetic property. (5)
10. What do you mean by conformation? Draw the staggered and eclipsed conformation of ethane (5)
11. Draw the molecular energy level diagram for B_2 molecule and calculate bond order. (5)

OR

(5)



Convert it into flying wedge projection formula.

12. State the Fajan's rules to explain covalent character in ionic compounds. (5)

OR

Write the fisher projection formulae 2-hydroxy 3-bromobutanoic acid? Convert it into Sawhorse and Newman projection formulae. [2+3] (5)