BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Biotechnology

Course Name – General Chemistry

Course Code - BBTC303

Semester / Year - Semester III

Time allotted : 75 Minutes Full Marks : 60

[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 60=60

1. *(Answer any Sixty)*

(i) Which atom is most likely to form a -1ion?

a) I b) S

c) Ag d) P

(ii) Many ionic compounds have some covalent ability due to

a) ion polarization b) charge polarization

c) proton polarization d) electron polarization

(iii) Identify the ions present in (NH4)2Cr2O7

a) N3-,H+,Cr3+,O2- b) N3-,H-,Cr3+,O2-

c) NH4+and Cr2O72- d) NH3and H2Cr2O7

(iv) Homolysis takes place by formation of

a) free radicals b) carbocations

c) carbanions d) all of these

(v) Addition of HBr to alkene in presence of peroxide is an example of

a) heterolysis b) hemolysis

c) both heterolysis and hemolysis d) both of these

(vi) Heterolysis is favoured in _____ solvent

a) non polar
b) polar
c) does not depend on polarity of solvent
d) both non polar and does not depend on polarity of solvent

(vii) -I effect increases in the order

a) –CH2-X < -CHX2 <-CX3
b) -CHX2 <-CX3 <–CH2-X
c) -CX3 <–CH2-X < -CHX2
d) –CH2-X > -CHX2 <-CX3

(viii) Permanent dipole induced due to difference of electronegativity in the ground state of the molecule is called

a) electromeric effect
b) resonance
c) carbocation
d) inductive effect

(ix) An electrophile is added to the alkene. It is an example of

a) electron donating inductive effect
b) electron donating mesomeric effect
c) electron donating electromeric effect
d) hyperconjugation effect

(x) O- hydroxy benzoic acid is more acidic than p-hydroxy benzoic acid due to

a) Intermolecular H-bonding
b) Intramolecular H-bonding
c) Both of these
d) Vanderwaal’s force

(xi) Triphenyl methyl radical is extremely stable due to

a) more resonance
b) more inductive effect
c) dimerisation
d) all of these

(xii) Cyclobutadine acquires some stability by assuming what form?

a) triangular
b) hexagonal
c) pyramidal
d) rectangular

(xiii) Cyclopropenyl anion is an example of _____ molecule.

a) aromatic
b) non aromatic
c) anti-aromatic
d) homo aromatic

(xiv) A molecule is called aromatic if it contains

a) 4n? electrons
b) 2n? electrons
c) (4n+2)? electrons
d) (2n+2)? electrons

(xv) Phenol is less acidic than acetic acid because phenol has

a) 5 resonating structures
b) 20% location of negative charge on O
c) 40% location of negative charge on O
d) 80% location of negative charge on O

(xvi) pka2 of maleic acid is greater than fumaric acid because

a) intramolecular H bonding
b) intermolecular H bonding
c) repulsion between two COO- groups
d) resonance

(xvii) Phthalimide is less basic than acetamide because

a) due to 2 resonating structures in phthalimide
b) due to 1 resonating structures in phthalimide
c) due to 3 resonating structures in phthalimide
d) due to 4 resonating structures in phthalimide

(xviii) Aniline is less basic than methyl amine because

a) due to electron withdrawing inductive effect of NH2 group in aniline
b) due to 5 resonating structures in case of aniline
c) due to electron donating mesomeric effect of NH2 group in aniline
d) both due to 5 resonating structures in case of aniline and due to electron donating mesomeric effect of NH2 group in aniline

(xix) The name “Green Chemistry” was suggested by

a) Kenneth Geiser
b) J.A. Linthorst
c) Paul Anastas
d) Roberi Goddard

(xx) The number of principles of green chemistry is

a) 2
b) 6
c) 10
d) 12

(xxi) Predict the shape of the H2O compound based upon concepts of hybridization.

a) tetrahedral
b) angular or bent structure
c) trigonal planar
d) pyramidal

(xxii) Number of chlorine atoms which form equatorial bonds in PCl5 molecule are

a) 1
b) 2
c) 3
d) 4

(xxiii) The bond angles in sp3d2 hybridization is

a) 90°
b) 120°
c) 109.5°
d) 180°

(xxiv) Which statement is true

a) All the hybridized orbitals are not equal in energy and shape.
b) All the hybridized orbitals are equal in energy and shape.
c) All the hybridized orbitals are equal in energy but not in shape
d) All the hybridized orbitals are not equal in shape but not in energy

(xxv) During the formation of a chemical bond

a) energy decreases
b) energy increases
c) energy of the system does not change
d) electron-electron repulsion becomes more than the nucleus-electron attraction

(xxvi) In NO3– ion, the number of bond pairs and lone pairs of electrons on nitrogen atom are

a) 2, 2
b) 3, 1
c) 1, 3
d) 4, 0

(xxvii) 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°

(xxviii) Configuration means the relative arrangement of atoms in

a) 2D
b) 3D
c) 1D
d) All of these

(xxix) The stereoisomers which rotates the plain polarized towards right is known as

a) R
b) S
c) D
d) d

(xxx) Light having a single wavelength and whose electronic vector vibrates in infinite no of planes is known as

a) ordinary light
b) plane polarized light
c) monochromatic light
d) all of these

(xxxi) Compounds which have different arrangements of atoms in space while having same atoms bonded to each other are said to have

a) position isomerism
b) functional group isomerism
c) chain isomerism
d) stereoisomerism

(xxxii) Which is the most stable form of n-butane?

a) Gauche
b) Staggered
c) Eclipsed
d) Partially eclipsed

(xxxiii) 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) CONH2
c) H
d) COOH

(xxxiv) 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

(xxxv) Which is the least stable form of n-butane?

a) Eclipsed
b) Staggered
c) Partially eclipsed
d) Gauche

(xxxvi) In flying wedge projection formulae , vertical bonds are projected

a) on the plane of the paper
b) below the plane of the paper
c) above the plane of the paper
d) both on the plane of the paper and below the plane of the paper

(xxxvii) In Fisher projection formulae, one form can be converted to other form by rotation of what angle about the vertical axis

a) 60°
b) 180°
c) 360°
d) both 180° and 360°

(xxxviii) Non superimposable mirror images are known as

a) Enantiomers
b) Diasteromers
c) Optical isomers
d) Isomers

(xxxix) Optical rotation depends on

a) nature of sample and solvent
b) temperature of medium
c) wavelength of light used
d) all of these

(xl) 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
d) AgF >AgCl <AgBr >AgI

(xli) The bond dissociation enthalpies of the following bonds follow the order

a) C-C < O-O < F-F
b) F-F > O-O < C-C
c) C-C > O-O > F-F
d) C-C = O-O > F-F

(xlii) The shape of NH3 molecule is

a) linear
b) pyramidal
c) bent
d) tetrahedral

(xliii) The bond angle of H2O with respect to F2O is

a) greater
b) lesser
c) same
d) either greater or lesser depending upon situation

(xliv) Which of the following can make difference in optical isomers?

a) heat
b) temperature
c) polarized light
d) pressure

(xlv) 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

(xlvi) What is the effect of the optical angle of rotation (?) if length of polarimeter tube is halved and the concentration of the molecule is doubled

a) ? remains same
b) ? gets halved
c) ? gets four times
d) ? eight times

(xlvii) The potential energy of n-butane is minimum for

a) skew conformations
b) staggered conformations
c) eclipsed conformations
d) gauche conformations

(xlviii) Conformations are different arrangements of atoms that can be converted into one another by rotation about

a) covalent bond
b) double bond
c) single bond
d) triple bond

(xlix) The specific rotation of a compound is denoted by the symbol

a) R
b) S
c) ?
d) [?]D

(l) On increasing the number of alkyl groups, the stability of carbanions

a) increases
b) decreases
c) remains same
d) all of these

(li) Greater the number of resonating structures for a given intermediate,

a) less will be the stability
b) more will be the stability
c) it will not accept the stability
d) same will be the stability

(lii) The phenomenon in which 2 or more structures, involving identical position of atoms can be written for a particular molecule, is called

a) conjugation
b) resonance
c) hyperconjugation
d) vibration

(liii) Green chemistry applies across the _____ of a chemical product like design, manufacture and use.

a) life cycle
b) properties
c) uses
d) efficiency

(liv) The green synthesis methods should have _____

a) low efficiency
b) high harmful products
c) low energy requirements
d) low atom efficiency

(lv) Which of the following is the greenest solvent?

a) formaldehyde
b) benzene
c) ethanol
d) water

(lvi) Which of the following is a challenge for green chemists?

a) Awareness of the benefits of green chemistry
b) Developing chemicals that are recyclable
c) Training for cleaning up chemical spills
d) Knowing when to reduce and eliminate hazardous waste

(lvii) Carbenium ion is _____ hybridized.

a) sp
b) sp2
c) sp3
d) sp3d

(lviii) In case of carbenium ion the vacant orbital is

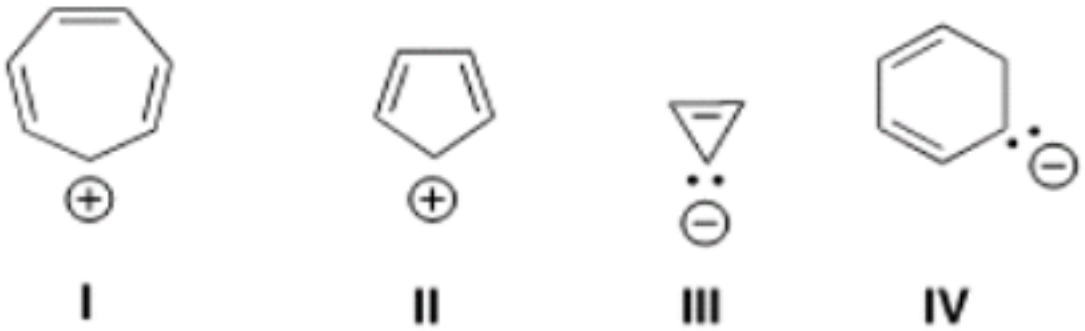
a) px
b) py
c) pz
d) s

(lix) What kind of hybridization is found in the methyl radical?

a) sp2
b) sp3
c) sp
d) sp3d

(lx)

Which of the following ions is aromatic?



I II III IV

a) I
b) II
c) III
d) IV