Anjuman Islam Janjira Degree College of Science Murud-Janjira, Raigad-402401 Affiliated to University of Mumbai	
Class: -F.Y.B.Sc G.S	**Subject: - Chemistry – I**
Semester:- I	**Course code: -USCH101**
Exam Event:- Additional Exam Summer 2024 (FH)	**Marks: -75**
Date: - 21/03/2024	**Duration: - 02:30 Hours**

N.B:

1. **All** questions are compulsory.
2. **Figures** to the right indicate full marks.
3. Use of log-table/non programmable calculator is allowed.
4. Answer for the same question as far as possible should be written together.

Q. 1 Attempt any four of the following. **20**

A) Give objectives and limitations of Thermodynamics.

B) Define the terms and give a suitable examples for each.

i) Isobaric process ii) Isochoric process iii) Reversible process

iv) Isothermal process v) Adiabatic process

C) Define enthalpy of combustion and give its applications.

D) Define the following terms

i) Molarity ii) Normality iii) Equivalent weight

iv) Basicity of acid v) Acidity of base

E) If the heat of formation of methane at constant pressure is -74.9 kJ mol^{-1} at 298 K , What is its value at constant volume

F) Determine the molarity of the following solutions which contain

a) 3.9 g of H_2SO_4 in 5Lof solution

b) 22.5 g of Na_2CO_3 in 500 cm^3 of solution

c) 10.0 g of CH_3OH in 200 cm^3 of solution

d) 15.0 g of $AlCl_3.6H_2O$ per litre of solution

(Atomic mass of H = 1, C = 12, O = 16, Na = 23, S = 32, Al = 27)

Q. 2 **Attempt any four of the following.** **20**

A) Explain discovery of electron in detail.

B) What are quantum numbers? Explain Principal and Azimuthal quantum numbers in detail.

C) Explain i) Aufbau Principle ii) Hund's maximum multiplicity rule iii) Pauli's Exclusion Principle

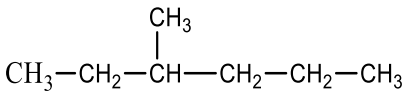
D) What is modern periodic law. Give the classification of elements.

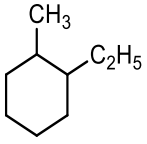
E) What is electron gain enthalpy? Explain factors affecting electron gain enthalpy.

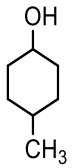
F) Give any five postulates of Bohr's Theory.

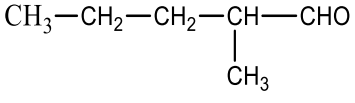
Q.3 Attempt any four of the following. **20**

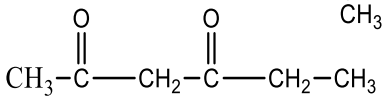
A) Give the IUPAC nomenclature for the following molecules

i) 

ii) 

iii) 

iv) 

v) 

B) Explain sp^3 hybridization of carbon with suitable example.
C) Give the difference between sigma bond and Pi bond.
D) Explain inductive effect.
E) What is carbocation? Explain structure and stability of carbocation.
F) What is reagent? Give and explain types of reagents.

Q.4 A) Select the correct option and complete the following sentences. (any eight) 08

1) A system that can exchange energy but not matter with surrounding is---------- system.
a) closed b) Open c) isolated

2) The properties which depend on the amount of the substance are called …… properties.
a) thermal b) intensive c) extensive

3) Zeroth law of thermodynamics based on the concept of----------.
a) volume b) Internal energy c) thermal equilibrium

4) The basicity of monobasic acid like CH3COOH is ----------.
a) 3 b) 1 c) 2

5) Cathode rays are made up of minute nigative particles called----------.
a) Protons b) electrons c) atoms

6) Rutherford carried out the experiment of scattering of ---------- particles.
a) beta b) alpha c) neutral

7) p-orbitals are having ---------shape.
a) spherical b) bell c) dumb-bell

8) In the long form of periodic table there are -------- periods and -----group are present respectively.
a)7 and 18 b) 18 and 7 c) 5 and 15

9) Sigma bonds are _____ than pi bonds.
a) Weaker b) Stronger c) either weaker or stronger

10) The shape of ethylene molecule is _____.
a) planar b) pyramidal c) tetrahedral

11) --------- effect takes place in double or triple bonds.
a) inductive b) electromeric c) resonance

12) Aldehydes and ketones contain ---------- group.
a) carbonyl b) Hydroxyl c) amide

B)State whether following sentences are True or False. (any three) 03

1. A system is that part of universe which is under thermodynamics study.
2. In isochoric process ---------- of the system remains constant.
3. Protons and electrons together are called as nucleons.
4. Magnetic quantum number is represented by symbol l.
5. 3-pentanol is a secondary alcohol.
6. The carbon atom in carbanion is positively charged

C) Match the following (Any Four) 04

i) Normality	a) aldehyde group
ii) Molarity	b) N
iii) Principal quantum number	c) $\Delta H = 0$
iv) Inert gases	d) n
v) -OH	e) Group 18
vi) NH_3	f) nucleophile
	g) hydroxyl group
	h) M