

VPM's B. N. BANDODKAR COLLEGE OF SCIENCE (Autonomous) THANE

FYJC FIRST TERM EXAMINATION JANUARY 2023

SUB: CHEMISTRY

MARKS: 50

TIME: 2:30 MIN.

DATE:05/01/2023

**NOTES:** i) All questions are compulsory.

ii) Draw neat, labelled diagrams and write balanced chemical equations wherever necessary.

iii) Question paper consists of 23 questions divided into FOUR sections, namely A,B,C &D.

iv) **Section A** contains two questions. Q.1 contains seven MCQ sub questions carrying 1 mark each. Q. 2 contains seven very short answer questions carrying 1 mark each.

v) **Section B** contains Q. no. 3 to 13 of short answer 1-type questions two marks each. Internal choice is provided.

vi) **Section C** contains Q.no. 14 to 19 of short answer II type questions carrying three marks each. Internal choice is provided.

vii) **Section D** contains Q.no. 20 to Q. no. 23 of long answer type questions carrying four marks each. Internal choice is provided.

viii) For each MCQ, correct answer must be written along with its alphabet, e.g. a) ..... b) ..... C) ..... d) ..... etc.

ix) In case of MCQ ( Q.no. i to x) evaluation would be done for the first attempt only.

x) Start each question on new page.

xi) Figure to the right indicates full marks.

xii) Use log table if necessary. Use of calculator is not allowed.

Given:  $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$

Atomic weights: H=1, C=12, N=14, O=16, Cl=35.5.

**SECTION A**

**Q.1 Select and write the correct answer for the following 7 M multiple choice type of questions.**

i. Oxidation number of Fluorine (F) in all its compound 1M  
is

a) +1    b) +2    c) -1    d) -2

ii. An alkane contains 17 carbon atoms. Number of 1M  
hydrogen in that alkane are

a) 34    b) 32    c) 36    d) 38

iii. The temperature at absolute zero is 1M

a)  $273.15^{\circ}\text{C}$     b)  $0^{\circ}\text{C}$

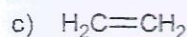
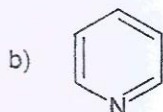
- Q.6 What happens when: [Write only the chemical equation] 2M  
 a) Calcium carbonate is thermally decomposed.  
 b) Sodium carbonate is hydrolysed by water.
- Q.7 a) How many particles are present in 1 mole of a substance. 2M  
 b) What is the ratio of molecules in 1 mole of  $\text{NH}_3$  and 1 mole of  $\text{HNO}_3$ .
- Q.8 Define reversible chemical reaction. Write the expression for  $K_c$  for the following equation. 2M
- $$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$$
- Q.9 Draw neat diagram of s – orbital and p – orbital. 2M
- Q.10 Explain why alkali metals have low ionization energies. 2M
- Q.11 What are Hydrocarbons? Draw isomer of n-Butane. 2M
- Q.12 Define electronegativity. Write the trends of electronegativity across a period and down the group. 2M
- Q.13 If  $n=2$ , What are the values of quantum numbers 'l' and 'm'? 2M

### SECTION C

Answer any four of the following

12 M

- Q.14 Derive an expression for  $K_c$  for the reaction 3M
- $$a\text{A} + b\text{B} \rightleftharpoons c\text{C} + d\text{D}$$
- Q.15 A compound on analysis gave the following percentage composition by mass. H = 9.09, O = 36.36, C = 54.55. Molecular mass of compound is 88. Find its molecular formula. 3M
- Q.16 Justify the following reaction as redox reaction. 3M
- $$2\text{Na}_{(\text{s})} + \text{S}_{(\text{s})} \longrightarrow \text{Na}_2\text{S}_{(\text{s})}$$
- Find out the Oxidizing and reducing agents.
- Q.17 Define atomic radius. Why a cation is smaller than the parent atom? 3M
- Q.18 Classify the following organic compounds according to the carbon skeleton. 3M

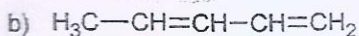
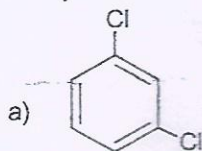


- Q.19 State Pauli's exclusion principle. Explain the 3M  
anomalous behaviour of Copper with the help of  
electronic configuration.

### SECTION D

**Attempt any Two of the following.** 8 M

- Q.20 Explain diagonal relationship between Beryllium and 4M  
Aluminum with the help of two illustrative properties.  
Write any two uses of alkali metals.
- Q.21 Define a) Molality b) Mole 4M  
A solution is prepared by adding 2 g of a substance A  
to 18 g of water. Calculate the mass percent of the  
solute.
- Q.22 a) Distinguish between Homolysis and Heterolysis. 4M  
b) Write the IUPAC names of the following organic  
compounds.



- Q.23 a) Write the balanced chemical reaction for 4M  
preparation of Ethane from  
i) Ethyl bromide  
ii) Ethyl magnesium iodide  
b) Identify the main product of the following reaction.

