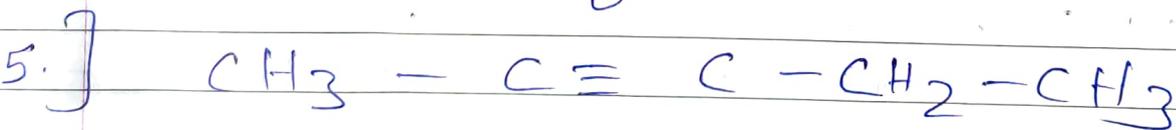
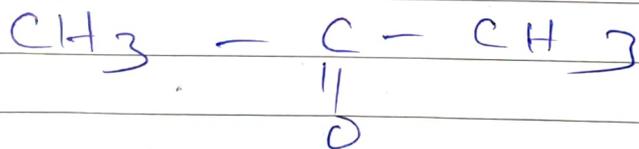
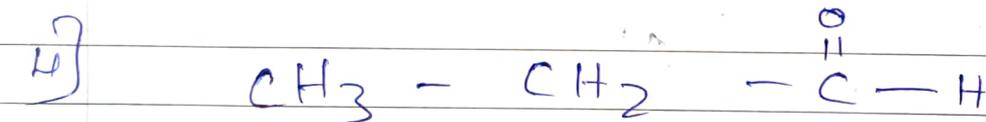
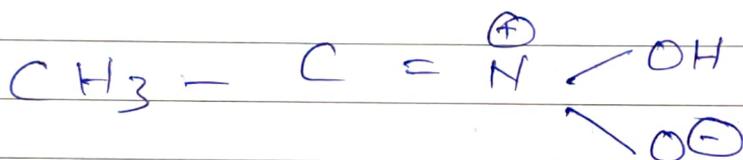
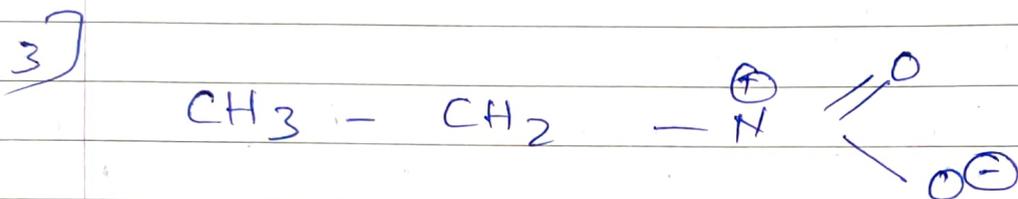
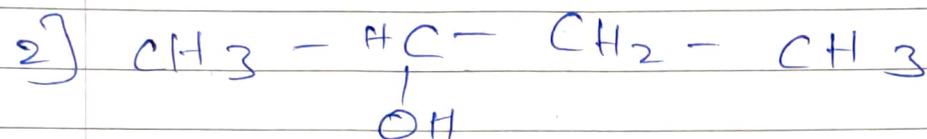
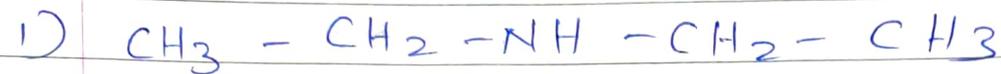


CHEMISTRY PRACTICE QUESTIONS

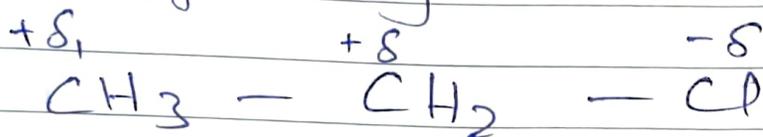
CH : 14 (Contd)

- Q1 select and write the most appropriate answers from the given alternatives for each subquestion:
- 1) What type of isomerism is shown by But-1-yne and But-2-yne ?
 a) Chain isomerism (b) Position isomerism
 c) Geometrical isomerism (d) Tautomerism
- 2) The hybridisation of central c-atom in carbocation is
 a) SP (b) SP³ (c) SP² (d) SP³d
- 3) Which one of following is a nucleophile
 a.) AlCl₃ (b) H₂O (c) BF₃ (d) NO₂⁺
- 4) Nucleophile are
 a) Nucleus loving (b) Nucleus hating
 c) electron loving (d) Electron hating
- 5) The geometry of carbocation is
 a) linear (b) ^{+ trigonal} Planar
 c) Tetrahedral (d) Octahedral
- 6) Which of the following is a temporary effect
 a.) Resonance effect (b) Electromeric effect
 (c) Inductive effect (d) None of the above
- 7) Which amongst the following have -I effect
 a.) C₂H₅ - (b) Mg (c) B (d) -COOH

Q2 Find out the type of isomerism exhibited by the following pairs:



Q3 An electronic displacement in a covalent bond is represented by the following notation



- a) Identify the effect
b) Is the displacement of electrons in a covalent bond temporary or permanent

Q4 Draw the resonance structures of the following:

- Phenol
- Benzaldehyde
- Buta-1,3-diene
- Acetate ion

Q5 Distinguish between:

- Inductive effect and electromeric effect
- Carbocation and Carbanion
- Nucleophiles and electrophiles

Q6 Explain:

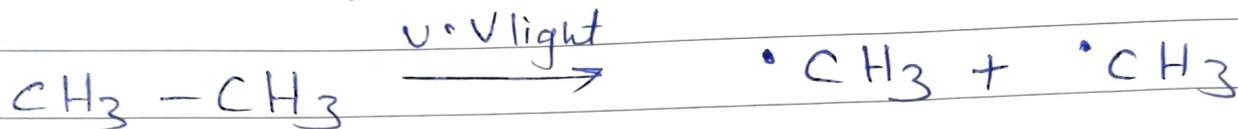
- Homolytic cleavage with suitable example
- Heterolytic cleavage with suitable example



Name _____

Subject _____

Q7 Observe the following questions given below; and answer the



- Name the reactive intermediate produced
- Indicate the movements of electrons by suitable arrow to produce this intermediate
- Comment on stability of this intermediate produced

Q8 Define

- Resonance effect
- Free radical
- Electromeric effect
- Inductive effect

12) Draw Structure of chain isomers of butene

13) Draw the geometrical isomers of but-2-ene

14) State and explain Saytzeff's rule with suitable example

15) How is Propene obtained by dehalogenation reaction

16) Write Physical Properties of alkene

17) State and explain the Markovnikov's rule with suitable example

• 18 Explain the formation of alcohol from ~~alkene~~ alkene using Sulphuric Acid with suitable example.

• 19) Write reaction for the ozonolysis of following alkene i) ethene ii) Propene

20) How is acetylene prepared from the following

a) Methane

b) ~~but~~ Calcium Carbide

21) State the action of HBr on acetylene and methyl acetylene

22) How will you convert the following

a) But-1-yne to butan-2-one

b) Hex-3-yne to hexane-3-one.

23) State and explain the Huckel rule of ~~aromatic~~ aromaticity

24) How is benzene prepared from acetylene

Short Answer questions (2 Marks each)

- 1) Write the balanced Chemical Reaction for Preparation of ethane from.
 - a) Ethyl bromide
 - b) Ethyl magnesium bromide
- 2) What is the action of the following on ethyl iodide.
 - a) Alcoholic KOH
 - b) Zn.HCl
- 3) Predict the possible Product of the following Reaction
 - a) Chlorination of nitrobenzene
 - b) Bromination of Phenol
- 4) Differentiate between aromatic and aliphatic Compounds.
- 5) Draw Structures representing Staggered and eclipsed Conformation of ethane using Newman Projection
- 6) How will you Convert ethyl chloride into n-butane?
- 7) What is Grignard reagent? explain its Preparation
- 8) State Physical Properties of alkanes.
- 9) What is the action of Cl_2 and Br_2 on 2-Methyl Propane.
- 10) Write chemical equation for Combustion of butane and methane.
- 11) Write a short note on Pyrolysis of alkanes.

* Very Short Answer Questions (1 Mark each)

- 1) Name the alkene used in the manufacture of poly-ethene bags.
- 2) Which type of hybridization is observed in Carbon of Benzene.
- 3) Name two reagents used for acylation of benzene.
- 4) Define the geometrical isomers.
- 5) Write the combustion reactions of Benzene.
- 6) Write any two uses of acetylene.

Hydrocarbon

* Multiple Choice questions

1) The number of chain isomers of alkane containing six carbon atom is

- a) 3 b) 4 c) 5 d) 6

2) Which of the following compound has highest boiling point

- a) n-Pentane b) Iso-butane
c) Butane d) Neo-pentane

3) Which one of the following compound is an example of alkyne

- a) C_3H_8 b) C_3H_6 c) C_3H_4 d) C_4H_8

4) In ozonolysis of benzene, how many molecules of ozone are added?

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

5) Which of the following is a non-benzenoid aromatic compound.

- a) Naphthalene b) Anthracene
c) Biphenyl d) Furan

6) Benzene reacts with methyl chloride in presence of anhydrous aluminium chloride to give

- a) Toluene b) ethyl benzene
c) Iso-propyl benzene d) chloro benzene

7) Electrophile in chlorination reaction of benzene is _____

- a) Cl b) Cl^- c) Cl^+ d) Cl_2

- c) Law of conservation of mass d) Law of gaseous volumes
Attempt Following [2 M Each]

1. Calculate Number of atoms in
 - i) 0.4 mole of Nitrogen
 - ii) 1.6 g of sulphur
2. Find the formula mass of
 - i) $\text{Cu}(\text{NO}_3)_2$
 - ii) CaCl_2
3. Calculate the average atomic mass argon from the following data

Isotope	Isotopic mass (u)	Abundance
^{36}Ar	35.967	0.337%
^{38}Ar	37.962	0.063%
^{40}Ar	39.962	99.600%

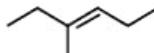
4. Convert the following degree celsius temperature to degree Fahrenheit.
 - i) 40°C
 - ii) 30°C
5. Calculate the molecular mass of following in u
 - i) H_2SO_4
 - ii) H_2O
6. Calculate number of moles and volume at STP for 3.4 g of ammonia (NH_3) gas.
7. State and explain Avogadro's Law
8. State and explain the law of definite proportions.
9. State TRUE or FALSE. If false correct
 - i) Recently, amu has been replaced by unified mass unit called Balaton
 - ii) Isotopes have same atomic mass
10. Give one example of each
 - a) Homogeneous mixture
 - b) Heterogeneous mixture
 - c) Elements
 - d) Compound
11. How many particles present in 1 mole of a substance and calculate the ratio of molecules in 1 mole of NH_3 and 1 mole of HNO_3

Attempt following [2 M Each]

1. Calculate number of moles in 5.6 dm^3 of hydrogen gas at STP

2. Write the formula to convert degree celsius temperature to Kelvin
3. Which of the following contains more number of atoms
 - i) 14 u of carbon
 - ii) 2.4 g of carbon
4. Which of the following gas occupies higher volume at STP
 - a) 6.022×10^{24} atoms of Helium
 - b) 0.2 moles of Helium
5. State the Law of multiple proportions
6. Define: Formula mass
7. Define: One mole
8. The mass of an atom of hydrogen is 1.008u. What is mass of 100 atoms of hydrogen?
9. What is meant by molar volume of a gas.
10. Write value of Avogadro's constant N_A
11. State Law of conservation of mass.

A. Select and write the most appropriate answer from the given alternatives for each sub question

i. The correct IUPAC name of the compound  is.

- a) hept - 3 - ene b) 2 - ethylpent - 2 - ene
c) hex - 3 - ene d) 3 - methylhex - 3 - ene

ii. The homologous series of alcohol has general formula _____ .

- a) $C_nH_{2n+1}OH$ b) $C_nH_{2n+2}OH$
c) $C_nH_{2n-2}OH$ d) $C_nH_{2n}OH$

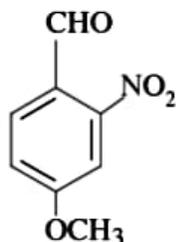
iii. The IUPAC name of CH_3CHO is

- a) Acetaldehyde b) Methyl aldehyde
c) formyl chloride d) ethanal

iv. Which of the following molecular formulas belongs to the alkyne series?

- a) C_7H_{14} b) $C_{10}H_{22}$
c) C_9H_{16} d) $C_{16}H_{32}$

v. What is the correct IUPAC name of



- a) 4 - methoxy - 2 nitrobenzaldehyde
b) 4 - formyl - 3 - nitroanisole
c) 4 - methoxy - 6 - nitrobenzaldehyde
d) 2 - formyl - 5 - methoxy nitrobenzene

vi. The functional group present in an organic acid is

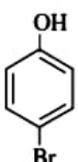
- a) - COOH b) - OH
c) - CHO d) $>C=O$

vii. Butanone is a four carbon compound with the functional group -

- a) ketone b) carboxylic acid
c) aldehyde d) alcohol

viii. What is the IUPAC name of $\text{CH}_3\text{COCH}(\text{CH}_3)_2$

- a) 3-methyl-2-butanone
- b) 4-methyl isopropyl ketone
- c) 2-methyl-3-butanone
- d) isopropyl methyl ketone

ix. IUPAC name of  is

- a) 1-Bromophenol
- b) Bromophenol
- c) 4-Bromophenol
- d) 1,2-dibromophenol

x. The organic compound possessing two or more functional groups (same or different) in their molecules are called

- a) Monofunctional compounds
- b) Open chain compounds
- c) Aromatic compounds
- d) Polyfunctional compounds

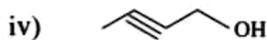
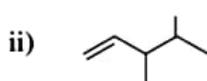
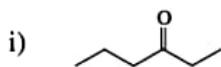
xi. Functional group present in primary amine is _____.

- a) $-\text{NO}_2$
- b) $-\text{NH}_2$
- c) $-\text{NH}-$
- d) $-\text{N}-$
|

xii. Correct structural formula of 2,2-dimethylpropane

- a) $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2\text{CH}_3$
- b) $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{CH}_3$
- c) $\text{H}_3\text{C}-\underset{\text{CH}_3}{\overset{\text{CH}_3}{\text{C}}}-\text{CH}_3$
- d) $\text{CH}_3-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_3$

B. Write dash formulae for following bond line formulae

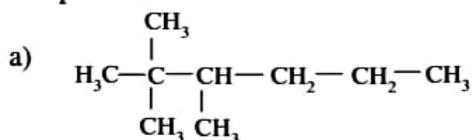


C. Write True or False

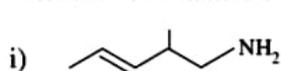
- i. Aniline is a heterocyclic compound
- ii. Tropone is a benzenoid aromatic compound
- iii. Compounds in which ring includes one or more heteroatoms are known as homocyclic compounds
- iv. Furan is an example of homocyclic compound
- v. Other name of acyclic compounds is aliphatic compounds

D. Answer the following :

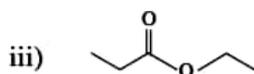
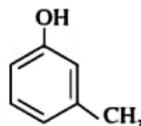
- i. Write a note on Wedge formula
- ii. Write first four members of the homologous series that begins with CH_3CHO
- iii. Define: Homologous series
Heterocyclic compounds
- iv. Identify primary, secondary tertiary and quaternary carbon in the following compounds



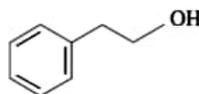
v. Write IUPAC names of the following



ii)



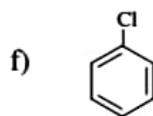
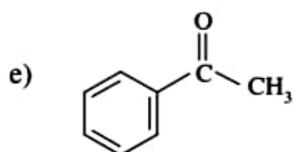
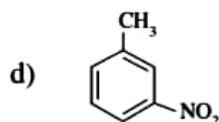
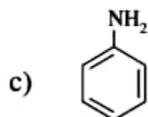
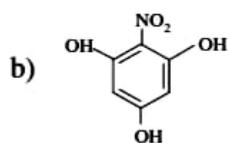
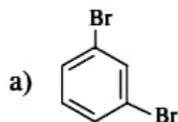
iv)



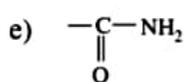
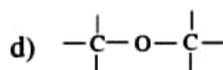
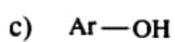
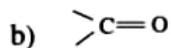
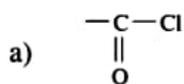
vi. Write structural formulae of following IUPAC names mentioned

- a 2, 3, 5 – trimethylhexane
- b 3, 4, 4 – trimethyl pentan – 2 – ol
- c 3 – ethyl – 5 – methyl heptane
- d 2 – Bromo – 3 – methylbutane
- e 3 – ethyl – 4 – methylhexane
- f 2, 3, 5 – trimethylhexane
- g 2, 3 – Dimethylpentane

vii. Write IUPAC names of following compounds



viii. Write the name of functional group of the following



CHEMISRTY
CHAPTER 2: INTRODUCTION TO ANALYTICAL CHEMISTRY

Q1. Multiple Choice Questions:

1. Which one of the following property of matter is Not quantitative in nature ?
a. mass b. colour c. volume d. length

2. When two properties of a system are mathematically related to each other, the relation can be deduced by _____
a. Working out mean deviation b. Plotting a graph
c. Calculating relative error d. all the above three

3. In $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ the percentage of water is _____
[Cu = 63.5, S = 32, O = 16, H = 1]
a. 10 % b. 60 %
c. 36 % d. 72 %

4. Which of the following is not temperature independent?
a. Mole fraction b. Molality
c. Mass percent d. Molarity

5. 7 gram of N_2 reacts with 3 gram of H_2 as per the reaction
 $\text{N}_2 + 3\text{H}_2 \longrightarrow 2\text{NH}_3$. The limiting reagent in this reaction is _____
a. N_2 b. NH_3
c. H_2 d. Both N_2 & H_2

6. Two elements A (At. mass 75) and B (At. mass 16) combine to give a compound having 75.8 % of A. The formula of the compound is _____
a. AB b. A_2B_3
c. AB_2 d. A_2B

- In one experiment 100 gram of metal ore when roasted, found to liberate 22.8 liters of sulphur dioxide. If the actual volume of Sulphur dioxide that should be liberated is 23.09 liters , calculate absolute error and relative error.
- Distinguish between accuracy and precision
- How many liters of oxygen at STP are required to burn completely 2.2 g of propane, C₃H₈ ? [At. wt C= 12; H= 1]
- What weight of calcium oxide will be formed on heating 19.3 g of calcium carbonate ? [At. wt. : Ca = 40 ; C = 12 ; O = 16]
- The three identical samples of potassium chlorate are decomposed. The mass of oxygen is determined to be 3.87 g, 3.95 g and 3.89 g for the set. Calculate absolute deviation and relative deviation.

Q4. Short Answers (3/4 marks)

- An organic compound containing oxygen, carbon, hydrogen and nitrogen contains 20 % carbon, 6.7 % hydrogen and 46.67 % nitrogen. Its molecular mass was found to be 60. Find the molecular formula of the compound.
[Atomic mass C=12, H=1, N= 14 ,O=16]
- A 1.000 mL sample of acetone, was placed in a small bottle whose mass was known to be 38.0015 g.
The following values were obtained when the acetone - filled bottle was weighed : 38.7798 g, 38.7795 g and 38.7801 g.
How would you characterise the precision and accuracy of these measurements if the actual mass of the acetone was 0.7791 g ?
- Urea [(NH₂)₂CO] is prepared by reacting ammonia with carbon dioxide.

$$2\text{NH}_3(\text{g}) + \text{CO}_2(\text{g}) \longrightarrow (\text{NH}_2)_2\text{CO}(\text{aq}) + \text{H}_2\text{O}(\text{l})$$
 In one process, 637.2 g of NH₃ are treated with 1142 g of CO₂ .
 (a) Which of the two reactants is the limiting reagent ?
 (b) Calculate the mass of (NH₂)₂ CO formed.
 (c) How much excess reagent (in grams) is left at the end of the reaction ?

ATOMIC STRUCTURE

MCQs

- 1) Rutherford's alpha-particle scattering experiment proved that atom has :-
(a) Electrons (b) Neutrons (c) Nucleus (d) Orbitals
- 2) A and B are two elements which have same atomic weight and are having atomic number 27 and 30 respectively. If the atomic weight of A is 57 then number of neutron in B is :-
(a) 27 (b) 33 (c) 30 (d) 40
- 3) Identify the Species which are isoelectronic to one another from
(i) CN^- (ii) OH^- (iii) CH_3 (iv) N (v) Co
Correct answer to this is --
(a) I, ii, iii (b) i, iii, iv (c) i, iv, v (d) ii, iii, iv
- 4) For any anion X^{-3} , the mass number is 14. If anion has 10 electrons, then number of neutrons in X_2 nucleus is :-
(a) 10 (b) 14 (c) 7 (d) 5
- 5) Which of the following pairs is correctly matched :
(a) Isotopes $^{40}_{20}\text{Ca}$, $^{40}_{19}\text{K}$
(b) Isotones $^{30}_{14}\text{Si}$, $^{31}_{15}\text{P}$, $^{32}_{16}\text{S}$
(c) Isobars $^{16}_8\text{O}$, $^{17}_8\text{O}$, $^{18}_8\text{O}$
(d) Isoelectronic N^{-3} , O^{-2} , Cr^{+3}
- 6) Which sub-shell is not permissible ?
(a) 2d (b) 4f (c) 6p (d) 3s
- 7) The orbital with maximum energy is --
(a) 3d (b) 6d (c) 4s (d) 5p
- 8) Maximum number of electron in 'N' shell is
a) 18 (b) 32 (c) 2 (d) 8

- 9) Which of the following is correct for a 4d-electron
- (a) $n = 4, l = 2, s = + 1/2$
 - (b) $n = 4, l = 2, s = 0$
 - (c) $n = 4, l = 3, s = 0$
 - (d) $n = 4, l = 3, s = + 1/2$
- 10) The basis of three unpaired electrons present in the configuration of nitrogen is
- (a) Aufbau principle
 - (b) Pauli's principle
 - (c) Hund's principle
 - (d) Uncertainty principle
- 11) n and l values of an orbital 'A' are 3 & 2 and that for another orbital 'B' are 5 & 0. The energy of
- (a) B is more than A
 - (b) A is more than B
 - (c) A and B are of same energy
 - (d) None
- 12) The maximum number of electrons in a given sub shell is given by _____
- (a) $2(2l+ 1)$
 - (b) $2l+1$
 - (c) $2(2l-1)$
 - (d) $(n-1)$
- 13) Which of the following atoms and ions are iso electronic having the same number of electrons as that of neon atom
- (a) F^-
 - (b) oxygen atom
 - (c) Mg
 - (d) N^-
- 14) Which of the following oxides of nitrogen is isoelectronic with CO_2 ?
- (a) NO
 - (b) N_2O
 - (c) NO_2
 - (d) N_2O_5
- 15) The ratio between neutron in C and Si with respect to atomic masses 12 and 28 is.....
- (a) 2 :3
 - (b) 3:2
 - (c) 3:7
 - (d) 3

Questions of One Mark :-

Q1) Define the following terms. (One mark each)

- i) Mass Number ii) Isotopes iii) Isobars
- iv) Wave length v) Orbit vi) Orbital

Q2) State the following.

- i) Heisenberg uncertainty principle.
- ii) Hund's rule of maximum multiplicity.
- iii) Pauli's exclusion principal.

Questions of Two Marks :-

Q.1) Write a note on (Two marks each)

- i) Spin quantum number
- ii) Azimuthal quantum number
- iii) Magnetic quantum number
- iv) Principal quantum number

Q.2) Distinguish between Orbit and Orbital.

Q. 3) Draw the shapes of 's' and 'p' orbital.

Q.4) State Aufbau principle with suitable example

Q.6) Write electronic configuration of the following elements in box diagram.

- i) ${}_6\text{C}$ ii) ${}_{11}\text{Na}$ iii) ${}_{15}\text{P}$ iv) ${}_{22}\text{Ti}$ v) ${}_8\text{O}$

Q.7) If $n = 2$ What are the values of quantum number 'l' and 'm'?

Q.8) What are the limitations of Bohr's atomic model?

Q.9) Give scientific reason, Why 4s orbital is filled before 3d orbital.

Q.10) Write the drawbacks of Rutherford's model of an atom.

Q.11) Write postulates of Bohr's Theory of hydrogen atom.

Q.12) Mention demerits of Bohr's Atomic model.

Q.13) Write orbital notations for electrons in orbitals with the following quantum numbrs.

a. $n = 2, l = 1$

b. $n = 4, l = 2$

c. $n = 3, l = 2$

Q.14) Write electronic configurations of Fe, Fe²⁺, Fe³⁺

Q.15) Write condensed orbital notation of electronic configuration of the following elements

a. Lithium (Z=3)

b. Carbon (Z=6)

c. Oxygen (Z=8)

d. Silicon (Z=14)

e. Chlorine (Z=17)

f. Calcium (Z=20)

q.16) Draw shapes of 2s and 2p orbitals.

Q.17) The electronic configuration of oxygen is written as $1s^2, 2s^2, 2p_x^2, 2p_y^1, 2p_z^1$ and not as $1s^2, 2s^2, 2p_x^2, 2p_y^2, 2p_z^0$. Explain.

Q.18) Indicate the number of unpaired electrons in :-

a. Si (Z=14) b. Cr (Z=24)

Q.19) An atom of an element contains 29 electrons and 35 neutrons. Deduce-

a. the number of protons

b. the electronic configuration of that element