MODEL QUESTION PAPER
CHEMISTRY

Max. Score: 40
Time : 1½ hr

Part I

A. From 1 to 6 write answer to any 4 questions.
1 score each) (4 x 1 = 4)

1. Which of the following subshell is having the least energy?
(4f, 3d, 1s, 2p)
2. The metal which is purified by distillation is
(Copper, Aluminium, Zinc, Sodium)
3. The functional group of acid
(- OH, - COOH, - OR, - COOR)
4. The number of atoms in 64 g oxygen
(6.022×10^{23} $2 \times 6.022 \times 10^{23}$, $4 \times 6.022 \times 10^{23}$, $10 \times 6.022 \times 10^{23}$)
5. The arrangement in which chemical energy is converted to electrical energy is _____
6. During the preparation of ammonia in the laboratory, the drying agent used is
(Sulphuric acid, Lime stone, Quick lime, Silica)

B. From 7 to 9 write answer to all questions

1 score each (3 x 1 = 3)

7. 99.9% ethanol is known as _____
8. What are the products abtained at cathode and anode when sodium chloride solution is electrolyzed?
9. The f – block elements in 6^{th} period are____

Part II

A. Write answer to the question given below.
2 score) (2 x 1 = 2)

10. The atomic number of an element X is 23. Write the subshell electronic configuration of this element and identify block, group and period the element.

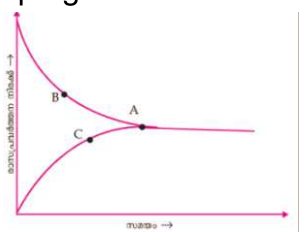
B. From 11 to 12 write answer to any one of the questions.
2 score) (2 x 1 = 2)

11. Find the number of molecules of ammonia in 112L of ammonia at STP
12. Aluminium is produced by the electrolysis of alumina. Cryolite is also added in this process. What is the use of it?

Part III

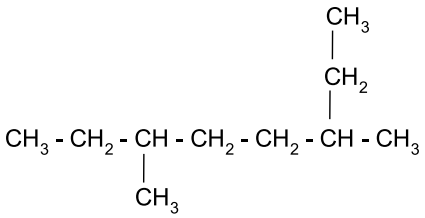
A. From 13 to 16 write answer to any 3 questions.
3 score) (3 x 3 = 9)

13. $MnCl_2$, $MnCl_4$ are two compounds formed by manganese.
    a) Find the oxidation state of manganese in each of these compounds.
    b) Write the subshell electronic configuration of these manganese ions.
    c) Based on these compounds explain the reason for the exhibition of variable oxidation states by d – block elements. (Mn – Atomic number 25)
14. Inflated balloon when kept in hot sun light bursts.
    a) Explain why the balloon bursts.
    b) Which gas law is associated with this observation?
    c) Write the mathematical expression of this law.
15. The graph given below is of a reversible reaction.



    a) Which of the graph indicates forward reaction?
    b) What is represented by 'A' in this graph?
    c) What is meant by chemical equilibrium?

16. See the structure of an organic compound given below.



a) How many carbon atoms are present in the longest carbon chain of this compound?

b) Write the name and position of branch in this compound.

c) Write the IUPAC name of this compound.

B. Write answer to the question given below.

3 score) (3 x 1 = 3)

17. How will you identify sulphate ion?

Part IV

A. From 18 to 20 write answer to any 2 questions.

4 score) (2 x 4 = 8)

18. Subshell electronic configurations of some elements are given below. (The symbols are not real) Analyse these and write answer to the questions given below.

(i) P = $1s^2\ 2s^2\ 2p^6$

(ii) Q = $1s^2\ 2s^2\ 2p^6\ 3s^1$

(iii) R = $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$

(iv) S= $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^3\ 4s^2$

(v) T= $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$

a) Which of these exhibit variable oxidation state?

b) Which of these element has the highest ionization energy?

c) Which belongs to alkali metals?

d) Write the molecular formula of the compound formed by the combination of the elements Q and R.

19. The equation representing the industrial production of ammonia is given below.

$$N_2(g) + H_2(g) \rightleftharpoons 2NH_3(g) + \text{heat}$$

Explain the effect of the following changes in the forward reaction of the given equilibrium.

a) More nitrogen is added

b) Pressure is increased.

c) Ammonia formed is liquefied and removed from the system.
d) Temperature of the system is reduced.

20. In the industrial production of iron,
a) What is the function of limestone in blast furnace?
b) What is the ore of iron used in this?
c) Complete the following equation.

$CaO + SiO_2 \rightarrow$ __(A)__

Flux + _(B)_ $\rightarrow$ Slag

d) What is name given to the iron obtained from blast furnace?

B. From 21 to 22 write answer to any one question
(4 score) (1 x 4 = 4)

21. Identify the pairs of isomers from the following compounds. Write the type of isomerism in each of these pairs.

a) $CH_3 - CH_2 - CH_2 - CH_3$

b) $CH_3 - O - CH_3$

c) $CH_3 - CH_2 - CH_2 - OH$

d) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

e) $CH_3 - CH_2 - OH$

22. In the electroplating of copper on iron bangle,
a) What is the anode?
b) Which solution is used aas electrolyte?
c) Write the reduction equation taking place at the cathode.
d) To electroplate iron bangle with silver ____ is used as electrolyte.

Part V

A. From 23 to 24 write answer to any one question
5 score) (1 x 5 = 5)

23. a) Draw the diagram of the galvanic cell constructed using the followings.
b) Write the equation of oxidation and reduction in this cell.
[Cu, Mg, Zn, CuSO4,ZnSO4, Beaker, Water, Voltmeter, Salt bridge]

24. Match the following

A	B
$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$	Addition reaction
n $CH_2 = CH - Cl \rightarrow$ $-[-CH_2 - CH(Cl)-]_n-$	Thermal cracking
$CH_3 - CH_3 + Cl_2 \rightarrow CH_3 - CH_2 - Cl + HCl$	Combustion
$CH_3 - CH_2 - CH_3 \rightarrow CH_2 = CH_2 + CH_4$	Polymerisation
$CH \equiv CH + H_2 \rightarrow CH_2 = CH_2$	Substitution reaction

Prepared by
1. GOKUL KUMAR E K
   HST, (Physical Science), KRHSS Purameri
2. MUNEER K
   HST, (Physical Science), Farook HSS, Farook College
3. DHANYA C
   HST, (Physical Science), EMSGHSS, Perumanna
4. SREEJA C K
   HST, (Physical Science), GHSS Avala Kuttoth
5. CYRIL BABY
   HST, (Physical Science), St. Josephs Boys Higher Secondary School, Kozhikode
6. LINEESH
   HST, (Physical Science), GHSS Valayam
7. DIVYA D (Coordinator)
   Lecturer in Science, DIET Kozhikode