

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE: CH/MC/IC24

B.Sc. DEGREE EXAMINATION, APRIL 2008
BRANCH IV - CHEMISTRY
SECOND SEMESTER

Reg. No

COURSE : MAJOR – CORE

PAPER : INORGANIC CHEMISTRY -I

TIME : 30 MINUTES

MAX. MARKS : 30

SECTION - A

TO BE ANSWERED ON THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS

(30 X 1 = 30)

I. Choose the correct answer :

- The highest group number in the usual long form of the periodic table is
a) 8 b) 16 c) 18 d) 32
- The inert pair effect is most pronounced in
a) B b) Ga c) In d) Tl
- The smallest atomic volume among the elements is for
a) Li b) Cs c) Rn d) K
- The element with the highest first ionization potential is
a) Boron b) Carbon c) Nitrogen d) oxygen
- Which among the following is a dipolar aprotic solvent?
a) water b) Ethanol c) Dimethyl sulphoxide d) Ammonia
- Among the following has longest bond length?
a) atomic radius b) covalent radius c) metallic radius d) vander waal's radius
- Which among the following can have both a conjugate acid and conjugate base
a) HSO_4^- b) H_2SO_4 c) SO_4^{2-} d) SO_3
- The oxidation numbers of oxygen in oxide, peroxide and superoxide are
a) -1,2,0 b) -2,-1,+1 c) -2,-1,- $\frac{1}{2}$ d) -1,-2,- $\frac{1}{2}$
- Alkaline potassium permanganate is an oxidising agent and its equivalent weight in the reaction $MnO_4^- \rightarrow MnO_2$ is
a) 31.6 b) 158 c) 52.67 d) 39.5
- The most stable oxidation state of chromium is
a) +6 b) +4 c) +2 d) +3
- In India monazite is available in the beach sands of _____ state.
a) Tamilnadu b) Kerala c) Andhra d) Karnataka

12. The method used for refining copper is
 a) Van Arkel b) Zone refining c) Electrolysis d) All the above
13. The molecular formula of haematite is
 a) Fe_3O_4 b) Fe_2O_3 c) Fe_2S_2 d) $FeCO_3$
14. Electromagnetic separation is applicable to
 a) Bauxite b) Wolframite c) Magnesite d) Haematite
15. Among the following which is not the magic number
 a) 28 b) 34 c) 20 d) 82
16. ${}_{18}Ar^{40}$ and ${}_{19}K^{40}$ are called
 a) Isotopes b) Isobars c) Isotones d) Nuclear isomers
17. β^+ is also known as
 a) electron b) positron c) Neutron d) Neutrino

II. Fill in the blanks:

18. Cations have radii _____ than the corresponding neutral atoms.
19. _____ is the most electronegative element.
20. Solutions of alkali metals in ammonia are _____ in colour.
21. Hydrofluoric acid functions as a _____ when dissolved in perchloric acid.
22. The principle of atom bomb is based on _____.

III State whether true or false:

23. ${}_{92}^{235}U$ is a fertile nuclide
24. BBr_3 is a stronger Lewis acid than BF_3 .
25. Bronze is a non-ferrous alloy.

IV Match the following:

- | | | | |
|----|----------------------|---|---------------------------|
| 26 | s-block elements | - | a) Uranium |
| 27 | d-block elements | - | b) Zone refining |
| 28 | ultrapure elements | - | c) coordination complexes |
| 29 | Radio active element | - | d) Hydrogen peroxide |
| 30 | Oxidising agent | - | e) Strong reductant |

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SECTION – B

I. Answer any five questions: (5x6=30)

1. Define electronegativity. List the factors affecting electronegativity.
2. Why is liquid ammonia called a leveling solvent? Explain with equations.
3. Give the Lewis definition of acids and bases. What is extended Lewis definition of acids and bases.
4. Define the following:
a) oxidation b) reduction c) reducing agent d) oxidizing agent
5. Write short notes on
a) Aluminothermic process b) Alloys of Manganese
6. List out the applications of isotopes in medicine.
7. Explain nuclear stability based on n/p ratio, giving two examples.

SECTION - C

II. Answer any two questions: (2x20=40)

8. a) Balance the following equation both by ion-electron method and oxidation number method.
$$MnO_4^- + H^+ + Cl^- \rightarrow Mn^{2+} + H_2O + Cl$$
 (12)
b) Explain Froth floatation and Carbo thermal reduction (5+3)
9. a) Explain the diagonal relationship between lithium and magnesium (5)
b) Define the term ionization potential. What are the factors that influence this property? Explain with examples. (15)
10. a) Explain nuclear fusion and nuclear fission reactions with example. Why is nuclear fusion more difficult to achieve than fission. (15)
b) The mass of ${}^{10}_5B$ is 10.12934 amu, the mass of proton is 1.0072766 amu and that of neutron is 1.0086654 amu. Calculate the nuclear binding energy per nucleon. (5)
11. Give an account of the following
a) Van Arkel Process
b) Auto reduction
c) Electron affinity
d) What is HSAB principle and its applications (3+3+4+10)

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