LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIFTH SEMESTER – APRIL 2017

CH 5511- TRANS ELEM. & NUCLEAR CHEMISTRY

Date: 20-04-2017 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

PART-A

Answer **ALL** questions **(10x2=20 marks)**

1. What are transition elements? Why are they called so?
2. Mention the toxicity of mercury.
3. Write any two ores of tungsten.
4. Give the chemical equation of the role of ammonium molybdate in the qualitative analysis of phosphate ion.
5. Write the common oxidation states and electronic configurations of lanthanides?
6. Mention any two ores of copper and give the chemical formula.
7. Define magic number.
8. State odd-even rule.
9. What are nuclear chain reactions? Give an example.
10. What is the principle involved in carbon dating?

PART-B

Answer any **EIGHT** questions **(8x5=40 marks)**

11. Give any five differences between the first and other rows of transition elements.
12. What are metal borides? How are they prepared?
13. Explain how titanium is extracted from its ore?
14. Sketch Ellingham diagram and explain its usefulness.
15. Write a note on 'froth floatation process'.
16. Enumerate the differences between lanthanides and actinides.
17. Discuss the position of actinides in the periodic table.
18. What is binding energy? Calculate the nuclear binding energy per nucleon (in J) of $^{35}_{17}Cl$ (34.95952 amu) the isotope.
19. Give any five applications of radioactive isotopes in the field of medicine.
20. State and explain Soddy's group displacement law.
21. Write a note on the fast breeder reactors.
22. Define the following terms.
    a) Critical mass b) Nuclear cross section c) Spallation

PART-C

Answer any **FOUR** questions **(4x10=40 marks)**

23. a) Explain the industrial applications of interstial compounds of V and Cr. **(6)**

    b) Write any four applications of transition metals **(4)**

24. Explain the following with reference to metallurgical processes. **(5+5)**

    a) Mineral benefication b) Electrostatic precipitation

25. a) What is lanthanide contraction? Explain its causes and consequences. **(5)**

    b) How are lanthanides separated using solvent extraction methods? **(5)**

26. a) Distinguish between nuclear fission and nuclear fusion. **(5)**

    b) Write short notes on radioactive series. **(5)**

27. Explain the various factors affecting the stability of a nucleus.

28. Explain the principle involved and the applications of the following **(5+5)**

    a) Isotopic dilution analysis b) Neutron activation analysis.

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