SUBJECT CODE: CH/MC/IC13

B.Sc. DEGREE EXAMINATION, NOVEMBER 2009
BRANCH IV- CHEMISTRY
FIRST   SEMESTER
REG.NO ……………………..

COURSE   : MAJOR CORE
PAPER   : INORGANIC CHEMISTRY-I
TIME   : 30 MINUTES   MAX.MARKS : 30
SECTION – A   (30x1=30)
ANSWER ON THE QUESTION PAPER ITSELF.
Answer all the questions.

I   Choose the correct answer:

1.   Which of the following is not an ore?
     a) Zinc blend   b) Pig iron   c) Bauxite   d) Malachite

2.   Electrolytic reduction technique is used in the extraction of
     a) Metalloids   b) inner transition elements
     c) highly electropositive elements   d) highly electronegative elements

3.   Mercury is purified by
     a) Solidifying   b) distillation in vacuum
     c) treatment with dilute nitric acid   d) electrolytic method

4.   Which metal does not form amalgam
     a) Fe   b) Cu   c) Ag   d) Zn

5.   The formula of haematite is
     a) Fe_3O_4 b) $Fe_2 O_3$ c) $FeCO_3$ d) FeS_2

6.   Complex is formed in the extraction of
     a) K   b) Cu   c) Fe   d) Ag

7.   How many moles of I_2 are formed in the reaction
     $Cr_2 O_7^{2-} + H^+ + I^- \rightarrow Cr^{3+} + H_2O + I_2$
     a) 3   b) 6   c) 2   d) 14

8.   Gamma rays are
     a) high energy electrons   b) high energy electromagnetic waves
     c) high energy protons   d) low energy electrons

9.   In fission reaction the percentage of mass converted into energy is about
     a) 50   b) 1   c) 0.1   d) 0.01

10. If a nucleus has a half life of 10 days, what is the amount of sample left after 30
     days if the original amount is 100g
     a) 33.3   b) 50   c) 12.5   d) 25

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II Fill in the blanks:

11. Carbothermal process is used in the extraction of _____.
12. The oxidation number of oxygen in OF_2 is _____.
13. _____ is used as moderator in nuclear reactor.
14. A beta particle carries a unit negative charge and mass equal to 1/1840 of _____ atom.
15. When impurities are less fusible than the metal, then the process used is _____.

III State the following statements are true or false:

16. Yukawa predicted the subatomic particles as mesons.
17. Nuclear fusion is a natural phenomena.
18. A substance which reacts with gangue to form fusible material is called slag.
19. The oxidation state of Cr in CrO_2Cl_2 is +4
20. Stable metals occur in native state.

IV Match the following:

21. Cinnabar   Silver
22. Malachite   Manganese
23. Argentite   Zinc
24. Pyrolusite   Mercury
25. Calamine   Copper

V Answer in one or two sentences:

26. Define binding energy.

27. Define artificial transmutation.

28. What is a mineral? Give an example.

29. What is the equivalent weight of Mohr's salt?

30. Mention the significance of Meson.

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COURSE   : MAJOR CORE
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TIME   : 2 HOURS   MAX.MARKS : 70

SECTION – B   (5x6=30)
Answer any five questions:

1.   Explain the term K electron capture. Distinguish between K capture and positron emission.   (2+4)

2.   What is meant by stability belt? How does a nucleus behave if its neutron to proton ratio lies above and below the region of stability belt?

3.   What are magic numbers? Indicate its significance?   (3+3)

4.   Explain   a) Van Arkel process.   b) Mond's process

5.   a) Indicate the number of α / β particles liberated in the following:

$$_{92}U^{238} \rightarrow _{82}Pb^{204}$$

b) Explain Yukawa's theory.   (2+4)

6.   Define oxidation and reduction in terms of oxidation number with one example each.

7.   Distinguish between   a) Valency and oxidation number.
                            b) Roasting and calcination   (3+3)

SECTION – C   (2x20=40)
Answer any two questions:

8.   a) Distinguish the following with a suitable example   (6+6)
      (i) Natural and artificial radioactivity.   (ii) Nuclear fission and fusion.
      b) Discuss the applications of radio isotopes   (4+4)
      (i) in the study of reaction mechanism (any two)
      (ii) in medicine (any four)

9.   a) Explain isotopes, isotones and isobars with an example each.   (3+3+3)

b) Determine the equivalent weight of the following.   (3+3)

(i) Potassium permanganate in acidic media

(ii) Potassium dichromate in acidic media

c) Discuss the principle involved in redox titration   (5)

10.   a) What is meant by dressing of the ore? Describe any three processes carried out

for the dressing of the ore.   (2+9)

b) Explain group displacement law with examples.   (6)

c)   The half life period of a radioactive element is 1600 years. Calculate the

disintegration constant?   (3)

11.   a) Balance the following equations: (5+5)

(i) $Zn + HNO_3 \rightarrow Zn\,(NO_3)_2 + N_2O + H_2O$

(ii) $KMnO_4 + MnSO_4 + H_2O \rightarrow MnO_2 + K_2SO_4 + H_2SO_4$

b) Write a note on auto-oxidation.   (4)

c) Explain Aluminothermit process & zone refining.   (6)

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