Reg.No.

S.No. 25 BATCH: 2015, 2016

END OF SEMESTER EXAMINATIONS, APRIL / MAY-2017
INORGANIC CHEMISTRY-I
SUBJECT CODE: 15P3CH01

MAJOR : M.Sc. CHEMISTRY SEMESTER : I
TIME : 3 HOURS MAX.MARKS: 70

SECTION – A (10 X 1 = 10)

Answer ALL Questions:

1. What are Carboranes? Give an example.
2. Give any one method of preparation of Silane.
3. Classify the following as Hard soft acids and bases.
   (i) Pt^{4+} (ii) Ti^{4+} (iii) Ro^{-} (iv) RS^{-}
4. What are isopoly and heteropoly acids?
5. Complete the following reaction.
   $$Zn(OH)_2 + \underset{excess}{NaOH} \xrightarrow{liq.NH_3} ?$$
6. Solutions of alkali metals are intensely coloured in $liq.NH_3$. Give reason.
7. Calculate the n/p ratio of U^{235}, pb^{208}, o^{16} *and* cl^{35}.
8. What is meant by orbital electron capture?
9. Differentiate fissile and fertile isotopes.
10. What are transusanic elements?

SECTION – B (5 X 4 = 20)

Answer All Questions:

11. a) Discuss the mode of bonding in closo and nidoboranes with example+

    (OR)

    b) Describe the important features of the Orthosilicate and Pyrosilicate anions.
12. a) Give the applications of HSAB concept.

    (OR)

    b) Write a note on Symbiosis.
13. a) Give a brief account of organo phosphorous compounds.

    (OR)

    b) Discuss the chemistry of alkyl lithium compounds.
14. a) Explain the shell model of nuclear stability.

    (OR)

    b) What is binding energy ? Draw and explain the binding energy curve.
15. a) Outline the principle of isotopic dilution analysis.

    (OR)

    b) Define and give an example for each of the following nuclear reactions.
    (i) Nuclear fusion
    (ii) Nuclear fission
    (iii) Projectile-capture particle emission and
    (iv) Spallation

...2...

http://www.onlineBU.com

http://www.onlinebu.com

SECTION – C (5 X 8 = 40)

Answer All Questions:

16. a) Write short notes on the following

    i) $S_4 N_4$ ii) BN

(OR)

b) What is borazole? How it is prepared? Explain its structure and bonding.

17. a) What are phosphazenes? Discuss the structure and bonding in phosphazenes using Craig and Paddock and Dewar models.

(OR)

b) State HSAB Principle. Discuss the classification of hard and soft acids and bases.

18. a) Define Lattice energy. Deduce Born-Larde Equation.

(OR)

b) Discuss the following types of reactions in $lig.SO_2$ and provide 2 equations of each kind

(i) Acid base reaction (ii) Complex formation reaction
(iii) Precipitation reaction (iv) Solvolysis reaction.

19. a) (i) With a neat sketch explain the principle and working of GM Counter
    (ii) Explain meson field theory

(OR)

b) Give brief accounts on the following
(i) Cyclotron (ii) Modes of radioactive decay with examples.

20. a) (i) What is carbon dating? How is the age of wood determined?
    (ii) Explain nuclear cross section.

(OR)

b) (i) How are radioisotopes used as tracers? Give examples.
(ii) Determine the Q value of the following nuclear reaction. $^{14}N + {}^{4}He \rightarrow {}^{17}O + {}^{1}H$.

* * * * *

http://www.onlineBU.com

http://www.onlinebu.com