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END OF SEMESTER EXAMINATIONS, NOVEMBER - 2017

INORGANIC CHEMISTRY - I

SUBJECT CODE : 15P3CH01

MAJOR : M.Sc (Chemistry)

TIME : 3 HOURS

SEMESTER : I

MAX. MARKS: 70

SECTION A – (10 X 1 = 10)

Answer All the Questions:

1. Distinguish between orthosilicates and metasilicates.
2. Why is mica harder than talc?
3. Predict the general classes to which the following minerals belong to
 - a) Willimite
 - b) Beryl.
4. Classify the following compounds as Lewis and or base: $TiCl_4$, CO_2 giving reasons.
5. While hard-hard interactions are generally ionic, soft-soft interactions are covalent. Why is it so?
6. Ammonia forms a deep blue colour with sulphur. Give reason.
7. A negative packing fraction implies exceptional nuclear stability. Give example.
8. Which type of decay results in the formation of isobaric elements? Give an example.
9. Which are called competitive decay processes? Why?
10. Explain the term binding energy.

SECTION B – (5 X 4 = 20)

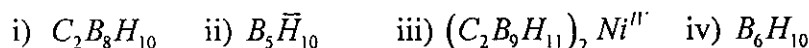
Answer All the Questions:

11. a) Using proper catalytic reactions prove that zeolites are catalysts.
(OR)
b) How do you prepare sulphur- nitrogen compounds $(SN)_x$?. Explain the structure of S_4U_4 .
12. a) Describe the Craig and Paddock model of chlorophosphonitrilic acid.
(OR)
b) Give an account of HSAB concept of acids and bases.
13. a) Whether ionic liquids are green solvents or not? Give reasons.
(OR)
b) Explain superconductors with suitable examples.
14. a) Discuss the postulates and applications of shell model.
(OR)
b) Give a brief account on nuclear isomerism.
15. a) How is the age of a rock determined by radio carbon dating?
(OR)
b) Explain the isotopic dilution analysis.

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SECTION C – (5 X 8 = 40)**Answer All the Questions:**

16. a) i) Apply Wade's rule to classify the following boranes.



ii) Contrast the chemistry of borazines with benzene.

(OR)

b) i) Discuss the sheet like and three dimensional network structures of silicates.

ii) Compare pyroxenes and amphiboles.

17. a) i) Explain the various isopolyacids of Vanadium.

ii) Write a note on symbiosis.

(OR)

b) Discuss the heteropolyacids 9, 12A and 12B.

18. a) i) Derive Born – Lande equation.

ii) Give a brief account on Solid state reactions with suitable examples.

(OR)

b) i) Discuss the reactions of SO_2 as solvent under the following headings.

Acid-base neutralisation reactions

Precipitation reactions

Solvolysis reactions.

ii) Explain the various reactions involving alkyl lithium compound.

19. a) Citing one example in each case, explain alpha decay, beta decay, gamma emission and positron decay.

(OR)

b) Explain the following:

i) cyclotron

ii) G.M. Counter

iii) internal corrosion

20. a) i) Discuss the Thermonuclear reactions in stars.

ii) Write notes on disposal of nuclear wastes.

(OR)

b) i) Write the applications of isotopes as tracers.

ii) Give a brief account on spallation.
