I Semester B Sc Examination - March 2022

DSC – Chemistry – I

CBCS Scheme

Time : 2 hours Max Marks : 60

Instructions:

1. The question paper has three parts. Answer all the three parts.
2. Draw diagrams and write chemical equations wherever necessary.

PART – A

Answer **any five** of the following questions**.** Each question carries **two marks.(5 x 2 = 10)**

1. State Heisenberg's Uncertainity Principle.
2. Mention two precautions to be taken while handling concentrated acids.
3. Write the electronic configuration of elements with atomic numbers 16 and 27.
4. What is the influence of sp^3 and sp hybridization on bond length in organic compounds?
5. What are f-block elements? Write its general electronic configuration.
6. How do you convert ethene to ethane?

PART – B

Answer **any four** of the following questions**.** Each question carries **five marks. (4 x 5 = 20)**

7. What is gravimetric analysis? Discuss the general rules for performing quantitative determination by gravimetric method. **(5)**

8. a. Mention the significance of principal and magnetic quantum number.
   b. Define Eigen function **(4 + 1)**

9. a. Define atomic radius. How does it vary along a period and down a group?
   b. Ionisation enthalpy of beryillium is greater than boron. Explain. **(3 + 2)**

10. a. Explain addition of water to an alkene.
    b. Explain E_1 mechanism with an example. **(2 + 3)**

11.a. Draw the titration curve for weak acid versus strong base. Mention the pH at its equivalence point.
   b. How does the acidic nature of the oxides of p-block elements vary down a group and across a period? **(3 + 2)**

12. a. State and explain Huckel's rule.
    b. What is the significance of ψ^2? **(3 + 2)**

PART – C

Answer **any three** of the following questions**.** Each question carries **ten marks. (3 x 10 = 30)**

13. a. Derive Schrodinger' time independent wave equation
    b. Define Laplacean operator (ii) Screening effect **(6 + 4)**

14. a. What are determinate errors? Discuss the different types of determinate errors.
    b. Mention the different methods of drying solids**.** **(6 + 4)**

15. a. Discuss the trends in the hydrides of group 13 and group 16.
    b. Between fluorine and chlorine which has higher electron gain enthalpy? Why?
    c. Write an equation to determine electro negativity by Pauling's method. **(6+2+2)**

16. a. Write the mechanism for addition of chlorine to ethene.
    b. Explain with examples: (i) epoxidation reaction (ii) Huckels rule
    c. Classify the following as an electrophile and nucleophile:
    (i)BF_3 (ii) NH_3 (iii) $-CN^-$ (iv) $-NO_2^+$ **(4+4+2)**

17. a. Define radial probability distribution and draw the radial probability distribution curve for 2s
    b. Calculate the mean of the following trials obtained during a titration (ml):
    9.1, 9.3, 9.6, 9.2 and 9.3
    c. Between Na^+ and F^- which is bigger in size? Why?
    d. Explain electromeric effect with an example. **(3+2+2+3)**

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