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Roll No.....

Total No. of Units : 04
Total No. of Printed Pages : 03

Code No. : 01/402

First Semester Examination, Dec. 2018

M.Sc. CHEMISTRY

Paper - IV

GROUP THEORY AND COMPUTER FOR CHEMISTS

Time : 3 Hrs. **Max. Marks : 80**

- Part A and B of each question in each unit consist of very short answer type questions which are to be answered in one or two sentences.
  Part C (Short answer type) of each question will be answered in 200-250 words.
  Part D (Long answer type) of each question should be answered within the word limit 400-450.

Unit - I

Q.1 A. List the distinct operations implied by axis. **(2)**

Q.1 B. What is necessity to include *E* with all the groups. **(2)**

Q.1 C. What is meant by similarity transformation. Identify the classes and subgroups of point group. **(4)**

OR

Construct the group multiplication table of point group.

Q.1 D. Determine point group of following compounds :
- Trans-dichloro ethene. **(12)**

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OR

Construct I[st] and IInd part of Character table of C_{2v} point group.

Unit - II

Q.2 A. Define refraction of radiation. **(2)**

Q.2 B. Calculate the wave number of radiation whose wavelength is 8 m. **(2)**

Q.2 C. Explain energy dissipation from excited state. **(4)**

OR

Define selection rules for IR and Raman spectroscopy.

Q.2 D. Describe types of molecular spectra. **(12)**

OR

Describe factors affecting the band width in vibrational and rotational spectra.

Unit - III

Q.3 A. Write the difference between RAM and ROM. **(2)**

Q.3 B. What is file? How it differs from a directory. **(2)**

Q.3 C. Compare DOS and UNIX operating system. **(4)**

OR

Explain symbols of flow chart.

Q.3 D. Explain operators used in a 'C' program. **(12)**

OR

What do you understand by memory? Classify and explain each briefly.

Unit - IV

Q.4 A. What is "rules of priority" in 'C' language? **(2)**

Q.4 B. What are trigraph characters? **(2)**

Q.4 C. Explain syntax of "if statement". Give an example. **(4)**

OR

Write a program to check a number even / odd with "goto" statement.

Q.4 D. Write a program in *C* to calculate the lattice energy of a given inorganic compound where the : **(12)**

$$\frac{\mu}{(\mu_o)} = \frac{NA\, e^z z_+ z_-}{\gamma_o}$$

OR

Write a program in '*C*' to calculate pH of a solution by $pH = pK_a + \log\frac{[Salt]}{[Acid]}$ and find whether it is basic or acidic.

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