QP Code: RM20MSC113 Reg. No | | | | | | | | | | | AR 20

GIET UNIVERSITY, GUNUPUR – 765022

M. Sc (First Semester) Examinations, May – 2021

20CHPC103 – PHYSICAL CHEMISTRY – I

(Chemistry)

Time: 2 hrs Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A **(2 x 10 = 20 Marks)**

Q.1. Answer ***ALL*** questions

a. Define symmetry operation

b. State great orthogonality theorem

c. What is projection operator?

d. Write down the expression for A and E SALC for D3h symmetry

e. Define degeneracy.

f. State variation theorem

g. Mention the condition for perturbation theory to be applied

h. Give two examples for conditional statement

i. Write the structure if input statement in 'C' language

j. Calculate the charge density of the carbons in ethylene

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions Marks

2. Discuss the various symmetry elements with suitable example for each. **(6)**

3. What are point groups? How will you identify the point group of a molecule **(6)**

4. Discuss the application of group theory for σ-bonding in octahedral complexes **(6)**

5. Write down Schrodinger wave equation for hydrogen atom and solve the radial part **(6)**

6. State and explain perturbation theory and arrive the expression for the first order correction in energy of a non-degenerate case **(6)**

7. Derive the expression for wave function of a Simple harmonic oscillator by solving Schrodinger equation **(6)**

8. Discuss the various constants and variables in 'C' language **(6)**

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