NOVEMBER/DECEMBER 2019

MCH43 — PHYSICAL CHEMISTRY – IV

Time : Three hours   Maximum : 75 marks

SECTION A — (5 × 6 = 30 marks)

Answer ALL questions.

1. (a) Explain Franck-Condon principle.

Or

(b) Differentiate excimer and exciplex.

2. (a) Define quantum yield. How it is determined?

Or

(b) Comment on solar energy conversion.

3. (a) Explain wave particle duality.

Or

(b) Write short notes on operators. What is Hamiltonian operator?

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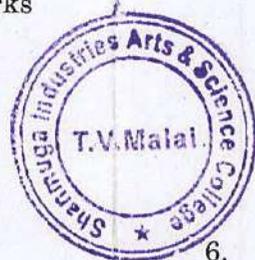
4. (a) What is Born-Oppenhimer approximation?

Or

(b) Apply Huckel theory to ethylene.

5. (a) Write short notes on Einstein model.

Or

(b) Write Sackur-Tetrode equation.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

6. Derive stern volmer equation. Write its application and deviations.

7. Explain the following :

(a) Hydrogen and halogen reaction kinetics.

(b) Photo isomerisation.

8. Derive Schrodinger wave equation for a particle in 3D box.

9. Discuss perturbation theory. Apply it for hydrogen molecule.

10. Define the following :

(a) Flux-force relationship.

(b) Negative Kelvin temperature.