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SUBJECT CODE NO:- H-178
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (Chemical) (Sem-II)
Physical Chemistry & Thermodynamics
[Revised]

[Time: Three Hours]**[Max.Marks:80]**

N.B

Please check whether you have got the right question paper.

- i) Solve any three questions from each section.
- ii) Assume suitable data wherever necessary.
- iii) Question no.1 and question no.6 are compulsory.

Section A

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| Q.1 | Explain the following terms. (any five) | 10 |
| | <ol style="list-style-type: none"> 1. Emulsions 2. Heat of adsorption 3. Viscosity 4. Crystalloids 5. Galvanic cells 6. Ionic mobility 7. Quantum yield | |
| Q.2 | a) Explain B.E.T. theory & its equation in detail. | 08 |
| | b) Explain Debye Huckel theory of strong electrolytes by explaining relaxation effect & electrophoretic effect. | 07 |
| Q.3 | a) Explain the term surface tension by liquids drop method. | 08 |
| | b) Explain in detail about the preparation methods of colloids and its applications. | 07 |
| Q.4 | a) Explain in different laws of photochemical reactions. (all three) | 08 |
| | b) Explain the kinetics of photochemical reactions of HI molecule. | 07 |
| Q.5 | Write notes on the following. | 15 |
| | <ol style="list-style-type: none"> a) Photosensitized reactions b) Applications of Gels and foams c) Stark Einstein's law of photochemistry | |

Section B

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|-----|--|----|
| Q.6 | a) Distinguish between system and supporting. | 03 |
| | b) Distinguish between steady state and equilibrium. | 03 |
| | c) Distinguish between Reversible and irreversible process | 04 |
| Q.7 | a) How do you state mathematically the first law as thermodynamics? That can be used for solving steady-state fluid flow problems. | 10 |
| | b) What is enthalpy of a system? How it is related to the internal energy. | 05 |

- Q.8 a) Water is flowing in a straight horizontal insulated pipe of 25mm inner diameter. There is no device present for adding or removing energy as work. The upstream velocity is 10m/s. The water flows in a section where the diameter is suddenly increased.
- What is the change in enthalpy if the downstream diameter is 50mm?
 - What is maximum enthalpy change for a sudden enlargement in pipe?
- b) How is the standard heat of reaction is evaluated using the standard heat of formation. 07
- Q.9 a) What is the expression for the work done in an adiabatic process. in terms of the pressure ratio? 07
- b) Give the Kelvin-planck statement and clausius statement of second law of thermodynamics and show that they are equivalent. 08
- Q.10 Write notes on 15
- Entropy and irreversibility
 - Polytropic process
 - Joule's experiments