

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(MID SEMESTER EXAMINATION)

CLASS: ISc  
BRANCH: CHEMISTRY

SEMESTER: VI  
SESSION : SP/2020

SUBJECT : IMC6003 PHYSICAL CHEMISTRY III

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
  2. Candidates may attempt for all 30 marks.
  3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. The missing data, if any, may be assumed suitably.
- 

- Q1 (a) Cite the differences between thermochemical and photochemical reactions. [2]  
(b) Define the second law of photochemistry. Obtain the value of one Einstein of energy. [3]
- Q2 (a) What are the limitations of Lambert-Beer's law? [2]  
(b) Derive the Lambert-Beer's law for light absorption by solution. [3]
- Q3 (a) What are the primary and secondary photochemical reactions? [2]  
(b) The quantum efficiency for the hydrogen-chlorine reaction is very high. Explain. [3]
- Q4 (a) Explain permanent and induced dipole moment. [2]  
(b) Describe different types of polarization. What is distortion polarization? [3]
- Q5 (a) What is meant by magnetic permeability? [2]  
(b) How is the magnetic moment of a substance determined from molar magnetic susceptibility? [3]
- Q6 (a) What are the limitations of the Clausius-Mosotti equation? [2]  
(b) Draw and explain the graph between  $P_M$  and  $1/T$ . [3]

..... 27/02/2020 .....M