

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

CLASS: IMSC
BRANCH: CHEMISTRY

SEMESTER: V
SESSION : MO/2019

SUBJECT : IMC5001 PHYSICAL CHEMISTRY I

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.
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- Q1 (a) Draw the neat and clean phase diagram for water and CO₂ system. [2]
(b) Explain the similarities and dissimilarities between water and CO₂ phase diagram. [3]
- Q2 (a) What are congruent and incongruent m. p. Give these with examples. [2]
(b) Draw the Mg-Zn system's phase diagram. Show different phase equilibria along lines and also show the congruent points. [3]
- Q3 (a) Write down possible statements of Raoult's and Henry's law. [2]
(b) Explain partially miscible liquids -phenol and water system. [3]
- Q4 (a) What is dry ice? Explain freezing mixtures. [2]
(b) Vapour pressure of pure CCl₄(mol.wt.154) and SnCl₄(mol.wt.170) at 25°C are 114.9 and 238.3mm Hg, respectively. Assuming ideal behavior. Calculate the total Vapour pressure of a mixture containing 10g of CCl₄ and 15g of SnCl₄. [3]
- Q5 (a) Define conjugate solution with example. [2]
(b) Show that entropy is not a suitable criterion for spontaneity of a system. Explain it in term of other state functions. [3]
- Q6 (a) Explain Nernst Heat Theorem graphically. [2]
(b) How does Nernst heat theorem lead to enunciation of the third law of Thermodynamics? [3]

::: 19/09/2019E :::::