Registration No: | | | | | | | | | | |

Total Number of Pages: 02

B.TECH
BS1103

1st Semester Back Examination 2015-16
CHEMISTRY - I
BRANCH(S): ALL
Time: 3 Hours
Max Marks: 70
Q.CODE: T836

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: **(2 x 10)**

a) Write the time independent Schrodinger wave equation.
b) Define Eutectic point.
c) Calculate the number of atoms per unit cell of face centered cubic structure.
d) Write two characteristics of catalyst?
e) What is the relationship between EMF and free energy change?
f) Write two differences between moleclurality and order of reaction.
g) what do you mean by entropy?
h) Define Hess's law.
i) What is crystal defect?
j) State first law of thermodynamics.

Q2 Draw the equilibrium phase diagram of Bi-Cd Alloy system. Discuss the lines and points of the diagram. **(2+8)**

Q3 **a)** What is first order reaction? Derive the relation between half life period and rate constant of first order reaction. **(5)**

b) A first order reaction is 50% remain in 30 min. at 27^0C and 50% complete in 10 min. at 47^0C. Calculate the activation energy of the reaction **(5)**

Q4 Discuss the measurement of EMF by potentiometric method. **(10)**

Q5 **a)** Show that for an ideal gas **(5)**

$$\left[\frac{\partial P}{\partial V}\right]_T \left[\frac{\partial V}{\partial T}\right]_P \left[\frac{\partial T}{\partial P}\right]_V = -1$$

b) If dU=TdS-PdV **(5)**
Show that

$$\left[\frac{\partial T}{\partial V}\right]_S = -\left[\frac{\partial P}{\partial S}\right]_V$$

Q6 **a)** Draw the molecular orbital diagram of Oxygen molecule. **(5)**

b) Write the electronic configuration of O_2 and O_2^-. Calculate the bond order and compare the stability and magnetic property **(5)**

Q7 **a)** What are the causes of Crystal defect? **(5)**

b) Define Schotty and Frenkel defect. **(5)**

Q8 What is fuel cell? Discuss the working and advantages of fuel cell. **(2+5+3)**

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