Registration No :

Total Number of Pages : 02

B.Tech
RCH2A002

2nd Semester Regular / Back Examination 2018-19
CHEMISTRY
BRANCH : AEIE, AERO, AG, AUTO, BIOMED, CIVIL, CSE, ECE, EEE, EIE, ELECTRICAL, ETC, IT, MANUTECH, MECH, METTA, METTAMIN, MINERAL, MINING, MME, PLASTIC, PT
Max Marks : 100
Time : 3 Hours
Q.CODE : F525
Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.
The figures in the right hand margin indicate marks.

Part- I

Q1   **Only Short Answer Type Questions (Answer All-10)**   (2 x 10)
a) Differentiate between Eutectic temperature and Critical temperature.
b) What do you mean by calorific value of fuel?
c) Why fusion curve of ice has negative slope where as transition curve has positive slope?
d) Define calorific value of fuel .
e) What do you mean by auxochrome and chromophores?
f) Define cetane number.
g) What do you mean by 0D Nano material and 1D nano material?
h) Define CNG.
i) Give an example of cathodic coating and anodic coating.
j) What is effect of conjugation on chromophores?

Part- II

Q2   **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)**   (6 x 8)
a) State and explain Beer – Lambert's law. Explain various type of electronic transition occurs in UV Spectroscopy with example
b) Write the approximate compositions and calorific value of water gas and producer gas.
c) Write three important applications of nanomaterials in environmental field.
d) Write down short notes on selection rule
e) Write down mechanism of electrochemical corrosion.
f) Describe in detail on synthesis of power alcohol.
g) Draw the phase diagram of Pb-Tin system and elaborate its salient features.
h) Describe the fractional distillation of petroleum.
i) Write short notes on proximate analysis of coal.
j) Write down top down approach for synthesis of nanomaterials.
k) The vibrational spectrum of HCl gas exhibits an absorption band centered $2,885cm^{-1}$. Calculate the force constant of the bond of HCl molecule. (mass: H = 1.0078u, Cl = 35.4993u)
l) A coal sample has following composition by weight C = 90% ; O = 3.0% ; S = 0.5%; N = 0.5% and ash = 2.5% . Net calorific value of coal was found to be 8490.5 kcal/kg .Calculate percentage of hydrogen and HCV and GCV of the coal sample.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3   Derive Schrödinger equation? Write its application to particle in one dimensional box   **(16)**
      .Also prove that this a Eigen value problem

Q4   What do you mean by the eutectic point? Discuss eutectic point with help of suitable   **(16)**
      diagram? Discuss its applications.

Q5   What do you mean by cracking? Discuss the mechanism of thermal cracking and   **(16)**
      catalytic cracking.

Q6   What are factors affecting corrosion? How can it be prevented?   **(16)**