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

Total Number of Pages : 02 **B.Tech**

PAC2A102

2nd Semester Back Examination 2018-19

APPLIED CHEMISTRY

BRANCH : AEIE, AUTO, CHEM, CIVIL, CSE, ECE, EEE, ELECTRICAL, ETC, IEE, IT, MANUTECH, MECH, METTA, MINING, MME, PE, PLASTIC, TEXTILE

Time : 3 Hours

Max Marks : 100

Q.CODE : F522

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 Short Answer Type Questions (Answer All-10) **(2 x 10)**

a) Justify the following organic compound attained the 18e configuration of their covalent model .Fe(η^5-C_5H_5) and Mo(η^5-C_6H_6)

b) What is the de-Broglie wavelength of an electron travelling at 1% of the speed of light?

c) During corrosion evolution of hydrogen occurs in……

d) The structure of Grignard's reagent is

e) Calculate the number of components and degree of freedom for N_2 (g) +O_2(g) $\leftrightarrow$ 2NO(g).

f) Calculate the uncertainty in velocity of a cricket ball (mass = 0.01 gm) if uncertainty in its position is of the order of 100 pm.

g) What is Pilling-Bed worth rule? What is its significance?

h) What do you mean by fuel? Discuss characteristics of good fuel.

i) Why calgon conditioning is better than the phosphate conditioning?

j) Suggest some chemicals reagent for removal of DO and CO_2 from water which is better and why?

Part- II

Q2 Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) **(6 x 8)**

a) Discuss various types of electronic transition.

b) Discuss characteristics of eutectic mixture.

c) What do you mean by operator? Discuss the commutative operator.

d) What do you mean by Caustic embrittlement ? How do you prevent caustic embrittlement?

e) Discuss the Ziegler –Natta catalyst.

f) What do you mean by Eigen value and Eigen value function ? Prove that for operator d^2/dx^2 for Ø(x) =sin2x is an eigene value problem and finds it Eigen value.

g) A coal has following composition by weight C = 90%; O =3.0%; S = 0.5% ; N = 0.5% and Ash is 2.5%. NCV value of coal was found to be 8490.5 kcal/kg . Calculate the percentage of hydrogen and HCV of coal.

h) Discuss preparation and use of producer gas and water gas.

i) State any TWO laws of quantum mechanics.

j) How can you prepare power alcohol?

k) Calculate moment of inertia and rotational constant of HF molecule having bond distance 92pm. (atomic mass H = 1.0078u and F = 18.9984u.

l) Discuss the one method for measurement of COD.

Part-III

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

Q3 Give a comparative account of κ, η *and* μ notations in organometallic compounds depending upon their modes of bonding of ligands. **(16)**

Q4 What do you mean by vapour pressure? Explain the vapour pressure curves in water and sulphur system with phase diagrams. **(16)**

Q5 What do you mean by corrosion? Discuss various types of corrosion with one example each along with their prevention method. **(16)**

Q6 What do you mean fuel? Discuss different type of methods carrying out for reformation of petrol. **(16)**