PILLAI COLLEGE OF ENGINEERING, NEW PANVEL
(Autonomous) (Accredited 'A+' by NAAC)
END SEMESTER EXAMINATION
SECOND HALF 2021

BRANCH: FE (ECS/EXTC)

Subject: Engineering Chemistry – I Solution   **Time: 02.00 Hours**
Max. Marks: 45   **Date: 08-04-2022**

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1. A) Two functions- 2M
      One example-1M
   B) Moisture reduces 1) heating value
                                2) Calorific Value ………… ……..3M
                                3) Efficiency
   C) Indicator- EBT
      Buffer Solution- NH_4Cl + NH_4OH ………………………..3M
      End point- Wine red to blue
   D) Viscosity (definition & Significance)
      Viscosity Index (definition & Significance)……………3M
   E) Explanation of Passivity of Al………………………………3M

2. A) Four differences between Octane No. & Cetane No.- 2M
      Compound with highest Octane no. - 1M
      Compound with highest Cetane no. - 1M
   B) Description of each factor………………..1x5 = 5M
   C)

Constituent	% by weight	Wt. of each per Kg of fuel
C	82	.82
H	3	.03
O	8	.08
S	2	.02
N	2	Doesn't participate
Ash	3	Doesn't participate

   ..1M

   Amount of air required (Kg) = 100/23(2.67C+ 8H+S-O)
                                = 100/23(2.67x0.82+ 8x0.03+ 0.02-0.08)

                                = 10.30 Kg…………………………………………..3M

   Amount of air required (Kg) for 2 Kg of Fuel= 20.60 kg

Volume of air for 2kg =   20.60x22.4/28.94

= 15.94 m^3

3. A) Stress Corrosion

Definition…….1M
Condition………2M
Example……….1M

B) Strength of SHW = 1mg/ml…………….1M

Strength of EDTA= 50/48 mg of $CaCO_3$ eqv…..1M

Total hardness= 312.5 ppm……………………………..1M

Permanent hardness= 208.33ppm……………………1M

Temporary hardness= 104.17 ppm……………………1M

C) Four differences with examples………………….6M

4. A) four differences of scale & sludge
    B) Definition- 1M
        Reaction-   2M
        Advantages- 1M
        Disadvantages-1M
    C) Cathodic Protection
            Principle- 2M
            Sacrificial Protection-2M
            ICCP- 2M