B.E - Bachelor of Engineering (CBCS Pattern) Second Semester CBCS

2BEAB03 - Applied Chemistry-II

P. Pages : 2 **GUG/W/18/11473**

Time : Two Hours * 3 5 5 8 * Max. Marks : 40

Notes : 1. Assume suitable data wherever necessary.
2. Diagrams and Chemical equation should be given wherever necessary.
3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Describe the process of fractional distillation of crude oil and write a note on important uses of various fractions obtained from crude oil. **5**

b) Find the gross as well as net calorific value of coal by Dulong's formula. **4**
C=68.3% ; H=4.8% ; O=2.1% ; S=1.2% ; N=3.8% ; Rest is ash.

c) Explain different types of calorific values of fuel. How it can be determined by using Boy's Gas Calorimeters. **5**

OR

2. a) Write a note on significance of ultimate analysis of coal. and parameters determined. **4**

b) A Bomb calorimeter experiment gave the following data: **4**
Weight of coal sample taken = 1.1 g
water equivalent of the calorimeter = 550 g
Weight of water taken = 2460 g
Rise in temperature = 2.51 ºc.
Cooling correction = 0.042 ºc.
Fuse wire correction = 8 cal.
Cottan thread correction = 4 cal.
Correction due to H_2SO_4 = 24.2 Cal.
Correction due to HNO_3 = 35.8 Cal.
If the fuel sample contains 5% hydrogen, calculate the gross and net calorific values of the fuel, presuming that the latent heat of steam is 587 cal/g.

c) Explain Fischer – Tropsch process for the synthesis of liquid Fuel. **6**

3. a) Explain the mechanism of electrochemical corrosion. **5**

b) Why does corrosion generally occur at anode? Describe the anodic protection of metal against corrosion. **4**

c) Write short notes on. **4**

i) Pitting corrosion.

ii) Water line corrosion.

OR

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4.	a)	State and explain Pilling-Bedworth rule.	**4**
	b)	Write a short note on role of Design and material selection in corrosion control.	**5**
	c)	How does the nature of the environment influence the rate of corrosion? Explain any four factors with examples.	**4**
5.	a)	Write the properties and uses of the carbon nano tubes.	**4**
	b)	State principles of Green Chemistry.	**5**
	c)	Write a short note on: Ni-Cd battery.	**4**

OR

6.	a)	A Charboneau's solid fuel has following percentage composition by mass, C = 81 %, H = 5%, O = 6.4 %, N = 1.4 % ash = remaining calculate minimum volume of air in m^3 at NTP required to burn 1 kg of this fuel. Calculate % Volume composition of dry products of combustion formed if 30% excess air is used.	**11**
	b)	State limitations and uses of fuel cell.	**2**

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