

(Please write your roll no. immediately)

58

roll no.

Term Examination (Regular) 2017-18

I semester [B. Tech]

Paper code: ETCHE-113

Sub: Applied Chemistry
Max. Marks: 30

Time: 1 1/2 hrs.

Note: Question 1. is compulsory. Attempt any two more.

1. (a) Gross and net calorific value will be the same if _____ (1 X 10)

(b) The decomposition of coal by heating it out of contact with air to give a solid residue, coke is called _____

(c) The substance with octane number 100 is _____

(d) The quality of diesel fuel depends on _____

(e) Name the catalyst used in catalytic cracking of heavy oil _____

(f) _____ is an example of metastable state.

(g) Decomposition of calcium carbonate represented by the equation $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ in a closed vessel constitutes a system with number of phases equal to _____

(h) The activity of a catalyst is completely destroyed by the foreign substance called _____

(i) Adsorption of H_2 on Nickel is an example of _____

(j) The optimum pH and optimum temperature for enzyme catalyzed reaction are _____

And _____

2. (a) Calculate the weight & volume of air required for the complete combustion of 4 m^3 of CH_4 . (4)

(b) Draw and explain the phase diagram of water system and also discuss the significance of temperature of triple point (6)

3. (a) Derive a general expression for the rate of reaction of an acid catalyzed reaction. (5)

(b) 1.56 gm of the coal was Kjeldahlized and NH_3 gas thus evolved was absorbed in 50 ml of 0.1 N H_2SO_4 . After adsorption the excess acid required 8.25 ml of 0.1 N NaOH for exact Neutralization. 2.50 g of the coal sample in a quantitative analysis gave 0.1555 g of BaSO_4 . Calculate the percentage of S and N in the coal sample. (5)

4 (a) How calorific value of a non volatile fuel can be determined? Explain with the help of neat Diagram. (6)

(b) Distinguish between proximate and ultimate analysis. (2)

(c) what is eutectic mixture? (2)