## END TERM EXAMINATION

FIRST SEMESTER [B.TECH] NOVEMBER-DECEMBER 2018

Paper Code: ETCH 113

Subject: Applied Chemistry

Maximum Marks:75

Note: Attempt any five questions including Q. No. 1 which is compulsory. Select one question from each unit.

Q1. What is a fuel? State the features of a good fuel.

(5x5=25)

- b) Draw the phase diagram of water. Explain the terms-critical point and triple point.
- What is a catalyst? Describe its characteristics features.
- d) Describe what is water softening by internal treatment.
- e) Discuss in detail the factors influencing corrosion.



Unit-I

- Differentiate between thermal & catalytic a) What is cracking? Q2. (6.5)cracking.
  - Explain knocking and anti knocking agents. What is cetane and octane number of a fuel?



- Draw a Labelled diagram and explain the working of Otto-Hoffmann's Q3. a) by-product oven for the manufacturing of metallurgical coke. (6.5)
  - The composition by weight of a coal sample is C=82%, H= 6%, O= 6%, S=1%, N= 2% and ash=3%. Calculate the minimum air required for complete combustion of 1kg of coal.



Unit-II

- a) State Gibb's Phase rule. Also, find the degree of freedom of the Q4. following systems:
  - i) NH<sub>4</sub> Cl(s) NH<sub>3</sub>(g) +HCl(g)
  - ii) Aquous solution of NaCl and Na2CO3.
  - iii) Water (liquid) water (vapour).

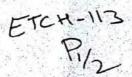
(6)

b) Draw the cooling curve of a pure substance and clearly identify the (6.5)eutectic point in it.



- a) Differentiate between congruent and Incongruent melting compound Q5. (6)by giving suitable examples.
  - b) Draw and explain the phase diagram of Lead-Silver System. (6.5)

P.T.O.



## Unit-III

Q6. a Describe in detail the EDTA method of determining the hard water.	(6.5)
Explain the use of catalyst in Industrially important process examples.	(6)
Q7. a) Discuss the lime-soda process used for external treatment for softening.	or water (6.5)
b) A water sample has the following dissolved salts (mg/L). Control its temporary and permanent hardness in ppm of CaCO <sub>3</sub> . Mg(HCO <sub>3</sub> ) <sub>2</sub> = 80, MgSO <sub>4</sub> = 110, CaSO <sub>4</sub> =85, Mg Cl <sub>2</sub> =94, CaNaCl=50.	alculate aCl <sub>2</sub> =84, <b>(6)</b>
<u>Unit-IV</u>	
Q8. Explain what is Soil Corrosion? How it is affecting the fer soil? How it can be prevented?	tility of (6.5)
What is Cathodic protection and sacrificial Anodic protection?	(6)
Q9. What happens and why?	
a) A piece of iron is kept in Saline water.	(3)
b) A steel pipe is connected to copper plumbing.	(3)
c) A zinc plate is fixed below the ship.	(3)
d) Iron next/ washers/ valves are cleaned and packed with zir and rotated.	nc dust (3.5)

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