Total No. of Questions : 6]

SEAT No. :

P553

[Total No. of Pages : 2

[4456]-8
F.E. (Semester - II)
APPLIED SCIENCE - II (Chemistry)
(2008 Course)

Time : 2 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Solve Q. 1 or Q. 2 Q. 3 or Q. 4 and Q.5 or Q.6.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain in brief the process of refining of crude oil. Give composition, boiling range and uses of any three fractions obtained. **[7]**

b) Write composition, properties and applications of CNG and LPG. **[6]**

c) A petrol sample contains 86% C and 14% H. Calculate quantity of air required for combustion of 1 kg of petrol. **[4]**

OR

Q2) a) Explain different types of calorific values of fuel. How it can be determined by using bomb calorimeter. **[7]**

b) Write a note on biodiesel. **[6]**

c) 2.5 g of coal sample weighed in silica crucible after heating for 1 hour at 110°C, the residue weighed 2.36 g. The crucible was then covered with lid and heated at 960°C for 7 minutes. The residue weighed 2.05 g. The crucible was further heated without lid until constant weight was obtained. The residue was found to be 0.20 g. Calculate % of fixed carbon. **[4]**

Q3) a) What is electrochemical corrosion? Explain hydrogen evolution and oxygen absorption mechanism. **[7]**

b) Write a note on electroplating with principle, diagram and applications. **[6]**

c) Give the different types of oxide film formed on the metal with examples. **[4]**

OR

Q4) a) Explain various cathodic protection methods to control corrosion with principle, figures and applications. **[7]**

b) Explain any six factors affecting the rate of corrosion of metal. **[6]**

c) Write a note on galvanic series. **[4]**

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Q5) a) What are the causes, disadvantages and prevention of scales and sludges in boilers? **[6]**

b) State Gibbs phase rule. Explain the terms involved in it. **[6]**

c) An exhausted zeolite softener was regenerated by passing 200 liters of 10% NaCl solution. How many liters of hard water sample having 350 ppm hardness can be softened by using this softener. **[4]**

OR

Q6) a) Describe ion exchange method for softening of water with suitable diagram and reactions. **[6]**

b) Explain EDTA method for determination of hardness of water. **[6]**

c) 100 ml of water sample requires 4.5 ml of 0.02N HCl upto phenolphthalein end point and total 13.5 ml upto methyl orange end point. Calculate the type and amount of alkalinity in the water sample. **[4]**

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