



Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2018-19

EXM/P/09/01

Year and Program: 2018-19

School of Technology

Department of FY B.Tech

Course Code: FYT103

Course Title: Applied Chemistry (Old)

Semester – II

Day and Date: Monday

End Semester Examination (ESE)

Time: Max Marks: 100

27-05-2019

10.30 to 1.30 pm  
4m

- Instructions for Students:**
- 1) All questions are compulsory.
  - 2) Draw neat labeled diagram wherever necessary.
  - 3) Figure to the right indicates maximum marks

- |           |   | Marks | COs |
|-----------|---|-------|-----|
| <b>Q1</b> | a) A sample of Water on analysis was found to contain the following impurities;<br>$\text{Ca}(\text{HCO}_3)_2 = 22 \text{ ppm}$<br>$\text{Mg}(\text{HCO}_3)_2 = 37 \text{ ppm}$<br>$\text{CaCl}_2 = 12 \text{ ppm}$<br>$\text{CaSO}_4 = 32 \text{ ppm}$<br>$\text{MgCl}_2 = 11 \text{ ppm}$<br>Calculate temporary, permanent and total hardness of water sample in mg/lit. Report your answer in degree Clark. | [8]   | CO1 |
|           | b) Solve any <b>TWO</b> of the following  | [10]  |     |
|           | i) What is hardness of water? Explain in detail.  |       | CO1 |
|           | ii) List different impurities present in natural water.   |       | CO1 |
|           | iii) Discuss ion exchange process for treatment of hard water.  |       | CO1 |
| <b>Q2</b> | a) What is cathodic protection? Explain sacrificial anode and impressed current methods.  | [6]   | CO2 |
|           | b) Solve any <b>TWO</b> of the following  | [10]  |     |
|           | i) What are the different factors affecting the rate of corrosion.  |       | CO2 |
|           | ii) Define electrochemical corrosion. Explain oxygen absorption mechanism with example.   |       | CO2 |
|           | iii) Discuss the material selection and design in controlling corrosion.  |       | CO2 |
| <b>Q3</b> | Solve any <b>FOUR</b> of the following  | [16]  |     |
|           | a) Give preparation, properties and applications of urea Formaldehyde resin   |       | CO3 |
|           | b) Distinguish between Thermoplastic and Thermosetting plastics.  |       | CO3 |
|           | c) Explain manufacturing of Portland cement.  |       | CO3 |
|           | d) What are conducting polymer? Explain.  |       | CO3 |

- e) What is refractory? Give the classification of refractories. CO3
- Q4** a) Define alloy. Explain the purpose of making alloy. [8] CO4
- b) Solve any **TWO** of the following [10]
- i) Discuss the process of Calcination and Rosting of ore. CO4
- ii) Explain the froth flotation process used for concentration of sulphide ore. CO4
- iii) Explain composition, properties and application of nichrome. CO4
- Q5** a) Following observations were recorded in a bomb calorimeter experiment. Calculate the HCV & LCV of the fuel. The fuel contains 2.8% hydrogen. [6] CO5
- Weight of coal burnt=0.90 gm  
 Mass of water in calorimeter = 2500 gm  
 Water equivalent of calorimeter = 550 gm  
 Observed rise in temperature =  $1.91^{\circ}\text{C}$   
 Cooling correction =  $0.027^{\circ}\text{C}$   
 Fuse wire correction= 12 Cal  
 Acid Correction = 59.0 Cal.
- b) Solve any **TWO** of the following [10]
- i) Explain principle, construction and working of Boy's calorimeter. CO5
- ii) What are the characteristics of good fuel? CO5
- iii) What is coal? Explain different types of coal. CO5
- Q6** Solve any **FOUR** of the following [16]
- a) Explain the construction and working of single beam spectrophotometer. CO6
- b) Write a note on Atomic Absorption Spectroscopy. CO6
- c) State and derive an equation for Beer's law. CO6
- d) Explain construction and working of glass electrode. CO6
- e) Write a note on potentiometric titration. CO6

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**ESE**