



Sanjay Ghodawat University, Kolhapur

2018-19

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017 EXM/P/09/01

Year and Program: 2018-19

School of Technology

Department of FY B.Tech

Course Code: FYT103

Course Title: Applied Chemistry

Semester – I

Day and Date:

End Semester Examination
(ESE)

Time:

Max Marks: 100

Saturday 24/11/2018

10:00 am to 1:00 pm

Instructions:

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

Q1

Solve the following questions

Bloom's level
L3
Marks [5]
COs CO1

- a) In a sample of water on analysis, it was found to contain the following impurities;
- $\text{Ca}(\text{HCO}_3)_2$ = 55 ppm
 $\text{Mg}(\text{HCO}_3)_2$ = 41 ppm
 CaCl_2 = 23 ppm
 CaSO_4 = 32 ppm
- Calculate temporary, permanent and total hardness of water sample in ppm. Comment on suitability of this water for drinking?

Or

- a) After analysis of water sample, it was found to contain the following impurities;
- MgSO_4 = 12 ppm
 $\text{Mg}(\text{HCO}_3)_2$ = 11 ppm
 CaCl_2 = 66 ppm
 CaSO_4 = 19 ppm
 NaCl = 10 ppm
- Calculate temporary, permanent and total hardness of water sample.
- b) What is hardness of water? Explain in detail.
- Or
- b) Explain how scale and sludge formation affects boiler operations.

L2 [5] CO1

L2 [5] CO1

Q2

Solve the following questions

- a) What is cathodic protection? Explain sacrificial anode and impressed current methods for corrosion prevention.
- Or
- a) What is corrosion? Explain classification with examples.
- b) What are the different factors affecting the rate of corrosion? Explain with example.

L1 [5] CO2

L1 [5] CO2
L2 [5] CO2

Or

	b)	Define electrochemical corrosion. Explain oxygen absorption mechanism with example.	L2	[5]	CO2
Q3		Solve any TWO of the following		[10]	
	a)	Explain manufacturing of Portland cement.	L2		CO3
	b)	What are conducting polymer? Explain.	L1		CO3
	c)	What is refractory? Give the classification of refractories.	L1		CO3
Q4	a)	Define alloy with example. Explain the purpose of making alloy.	L1	[5]	CO4
	b)	Solve any ONE of the following		[5]	
	i)	Explain composition, properties and application of nichrome.	L1		CO4
	ii)	Explain the gravity separation process used for concentration of sulphide ore.	L2		CO4
Q5	a)	Following observations were recorded in coal sample was burned in bomb calorimeter experiment. Calculate the gross and net calorific value of the fuel with 4 % hydrogen. Weight of coal burnt=0.50 gm Mass of water in calorimeter = 2100 gm Water equivalent of calorimeter = 330 gm Observed rise in temperature = 5.11°C Cooling correction = 0.025°C Fuse wire correction= 45.5 Cal Acid Correction = 85.0 Cal.	L2	[10]	CO5
	b)	Solve any FOUR of the following		[20]	
	i)	Explain principle, construction and working of Boy's calorimeter.	L2		CO5
	ii)	What are the characteristics of good fuel?	L1		CO5
	iii)	Write note on Calorific value of fuel.	L1		CO5
	iv)	Explain classification of coal.	L1		
	v)	Explain proximate and ultimate analysis of coal.	L2		
Q6	a)	What is pH? Explain in detail how Glass Electrode is used to determine pH of a solution.	L3	[10]	
	b)	Solve any FOUR of the following		[20]	
	i)	Explain the construction and working of single beam spectrophotometer.	L1		CO6
	ii)	Explain Atomic Absorption Spectroscopy.	L1		CO6
	iii)	State and derive an equation for Lambert's law.	L2		CO6
	iv)	Write a note on potentiometric titrations.	L1		CO6
	v)	Write note on conductometry.	L1		CO6
