

University of Mumbai

Examinations Commencing from 28th June 2022

Program: First Year (All Branches)

Curriculum Scheme: Rev 2019 – C Scheme

Examination: FE Semester I

Program Code: 1T01831//F.E(SEM-I) (all branches)(Rev-2019,'C'scheme)

Subject code: 58655/2019/Engineering Chemistry –I

Course Name: **Engineering Chemistry I**

Time: 2 hour

Max. Marks: 60

0607_R19_FE_I_FEC103_QP1

1 Attempt all questions 2 Atomic weights:- H=1, C= 12, N=14, O=16, Mg=24, S=32, K= 39, Ca= 40	
Q.1	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks. 2 marks each
1.	A 5ml sample of waste water was refluxed with 30ml of potassium dichromate solution and after refluxing the excess unreacted dichromate required 23ml of 0.1M FAS solution. A blank of distilled water on refluxing with 30ml of dichromate solution required 33ml FAS solution. Calculate the COD value of the waste water.
Option A:	2080 ppm
Option B:	1600 ppm
Option C:	800 ppm
Option D:	2000 ppm
2.	Which of following compound is not aromatic?
Option A:	Pyrrole
Option B:	Cycloheptatriene
Option C:	Cyclopentadienyl anion
Option D:	Naphthalene
3.	Which statement is true for thermoplastics?
Option A:	Thermoplastic do not soften on heating
Option B:	Thermoplastic are crosslinked Macromolecules
Option C:	Thermoplastic are organic solvent insoluble
Option D:	Thermoplastic is prepared by Addition Polymerization
4.	What will be Number of Phases at Eutectic Point?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
5.	Which of the following impurity is not responsible for hardness?

Option A:	NaCl
Option B:	MgCl ₂
Option C:	AlCl ₃
Option D:	CaCl ₂
6.	Which of the following is correct bond order for molecule 'NO'
Option A:	1
Option B:	2
Option C:	2.5
Option D:	3

Q.2	Solve <u>any Four</u> out of the following	4 marks each
a)	0.28g of CaCO ₃ was dissolved in HCl and Solution Made up to 1litre with distilled Water. 50 ml of above solution required 14ml of EDTA solution. 100ml of Hard water sample required 33 ml of EDTA solution. After boiling of this water, cooling and filtering 50ml of this solution on titration required 2.5 ml of EDTA solution. Calculate each type of Hardness of water.	
b)	State Gibbs phase rule and explain the terms involved in it.	
c)	Explain the aromaticity of Pyrrole with a diagram.	
d)	Write a brief note on 'Conducting Polymers'	
e)	Draw a neat sketch and explain the Electro-dialysis process used in purification of water.	
f)	Draw and explain the Phase diagram of water.	

Q.3	Solve <u>any Four</u> out of the following	4 marks each
a)	With a neat labeled diagram explain transfer molding of plastic material.	
b)	With the help of electronic configuration, draw the M.O diagram of CO molecule and explain its bond order and magnetic property.	
c)	Explain eutectic point, with the help of neat and labeled phase diagram of two component system.	
d)	Write a brief note on Ion Exchange process of softening of hard water.	
e)	Differentiate between Thermoplastic and Thermosetting Polymers.	
f)	Justify: - Why does Anthracene qualify as an aromatic molecule but Cyclobutadiene does not?	

Q.4	Solve <u>any Four</u> out of the following	4 marks each
a)	Give a brief account of Ultrafiltration.	
b)	Why Plasticizers and fillers are added during compounding of the plastic?	
c)	Explain why Benzene is an aromatic molecule?	
d)	Explain with MO diagram, Why Be ₂ does not exist?	
e)	What are factors that affect glass transition temperature?	
f)	Write any two important advantages and limitations of phase rule?	