(Autonomous College Affiliated to University of Mumbai)

Nov-Dec 2022 Examination to be conducted in Feb 2023

(B.Tech) Program: FY All Program

Examination: FY Semester: I

Course Code: **BSC103**   Course Name: **Engineering Chemistry**

Max. Marks: 45

Duration: 02 Hours

Instructions:

(1) All questions are compulsory.

(2) Draw neat diagrams wherever applicable.

(3) Assume suitable data, if necessary.

(4) Additional Data: Atomic weights:- H =1, C =12, N =14, O =16, Na =23, Mg =24, Cl = 35.5, K = 39, Ca =40 , S = 32

		Max. Marks	CO	BT level
		15		
Q 1	Solve **any five** questions out of six			
i)	Calculate % atom economy of reactions with respect to product acetophenone. $C_6H_6 + CH_3COCl \rightarrow C_6H_5COCH_3 + HCl$	3M	5	3
ii)	5.0 gm of coal sample was used for determination of nitrogen by Kjeldahl method. The NH_3 evolved was passed into 50ml of N/10 H_2SO_4. The excess acid required 20 ml of N/10 NaOH for neutralization. Calculate % of nitrogen.	3M	3	3
iii)	What is the difference between anodic and cathodic coatings?	3M	1	2
iv)	What is catalytic converter & and what are its advantages?	3M	3	2
v)	Define BOD and COD. What is the significance of determining BOD and COD of sewage water?	3M	2	2
vi)	Write the principles and applications of solar cells.	3M	4	1
		15		
Q.2	Solve **any three** questions out of four.			
i)	How the Ultrafilteration process is used for the separation of macromoleculs? What are the industrial applications of Ultrafilteration.	5M	2	2

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ii)	What is corrosion? Explain stress corrosion with the help of a diagram.	5M	1	1	
iii)	Calculate the gross and net calorific value of a coal sample having the following composition C = 74%, H = 8%, O=2.1%, N = 2%, S = 0.9% remaining being ash.	5M	3	3	
iv)	20 ml of standard hard water (15g CaCO3/lit) requires 30 ml of EDTA solution.100ml of water sample required 35 ml of EDTA solution. The same sample after boiling required 21 ml of EDTA solution. Calculate temporary hardness of water sample.	5M	2	3	
Q.3	Solve **any three** questions out of four.	15			
i)	What are the mechanisms of corrosion? Discuss the oxidation corrosion with role of nature of oxide film.	5M	1	2	
ii)	Compare conventional and Green route of carbaryl synthesis. Explain the principle of green chemistry involved in green route.	5M	5	2	
iii)	What is biodiesel and how is it produced? Why is it better than petro diesel?	5M	4	2	
iv)	What are the characteristics and applications of electrochemical series?	5M	1	1	

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