SOMAIYA VIDYAVIHAR UNIVERSITY

Semester: February 2022 **Examination: ESE Examination**		
Programme code: 01 **Programme: B.TECH**	**Class:** FY	**Semester:** I **(SVU 2020)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**	**Name of the Department** COMP/IT	
Course Code: 116U06C103	**Name of the Course: Engineering Chemistry**	
Duration : 1 Hour 45 Minutes (15 minutes extra for uploading)	**Maximum Marks : 50**	
Instructions: **1)Draw neat diagrams 2) Assume suitable data if necessary 3) Atomic Weight: H=1, C=12, N=14, S=32, O=16, Ca=40, Cl=35.5**		

Question No.		Max Marks
Q1 (A)	Objective/MCQs (**all Compulsory**) 1. Which of the following statement about polymers is not true? a) Most of the polymers are non-toxic & safe to use. b) Polymers can function as good thermal & electrical insulators c) Polymers can be moulded and fabricate easily. d) The properties of polymers are not time dependant. 2. The polymer which contains inorganic element is _____. a) Polyethene b) Polysiloxane c) Polystyrene d) Kevlar 3. When the size of the semiconductor falls _____ the Bohr Radius, the semiconductor is called a quantum dot. a) below b) above c) near to d) equal to 4. Amongst the following which carbon nanotubes are metallic in nature? a) Single walled arm chair CNTs & Single walled chiral CNTs. b) Single walled arm chair CNTs & Multi walled CNTs. c) Single walled chiral CNTs & Single walled zigzag CNTs. d) Single walled zigzag CNTs and Multi walled CNTs. 5. The incorrect formula for the absorbance in the following is? a) $A = - \log_{10} (1/T)$ b) $A = - \log_{10} T$ c) $A = 2 - \log_{10} \%T$ d) $A = 2 + \log_{10}(1 /\%T)$	10

	6. Which amongst the following is not a Green Solvent? a) Supercritical CO_2 b) Ionic liquids c) Water d) Chloroform 7. The general formula for zeolite is _____. a) $Na_2O.\ Al_2O_3.xSiO_2.yH_2O$; where x = 2-10 and y = 2-6 b) $NaO.\ Al_2O_3.xSiO_2.yH_2O$; where x = 2-10 and y = 2-6 c) $Na_2O.\ Al_2O_3.xSiO_2.yH_2O$; where x = 2-6 and y = 2-10 d) $NaO.\ Al_2O_3.xSiO_2.yH_2O$; where x = 2-6 and y = 2-10 8. In sewage treatment, which of the following step removes large floating matters. a) Primary treatment b) Preliminary treatment c) Tertiary treatment d) Secondary treatment 9. Octane number of n-heptane is _____. a) Zero b) 100 c) 50 d) 75 10. The spectroscopy technique in which odd number of spin of the nucleus is used to record the spectrum is _____ a) UV-VIS spectroscopy b) IR Spectroscopy c) NMR Spectroscopy d) Mass spectroscopy	
Q1 (B)	Attempt any **FIVE** questions out of the following (any 5 out of 7). 1. Give the preparation of standard hard water and calculate quantity of $CaCO_3$ in mg present in 20ml of standard hard water. 2. Explain the electrical conductivity of nanomaterials. 3. Write the classification of polymers based on conductance of electricity. Give two examples of each. 4. What is the purpose of the analysis of coal sample? 5. How to standardize pH meter using two point standardization method? 6. With respect to green chemical processes, explain what is energy efficiency? 7. Calculate the absorbance and molar absorptivity of the solution if $2.3x10^{-5}$ M solution is analysed using 1cm cuvette and the %transmittance is found to be 45%.	10
Q. 2	Attempt any **Two** questions out of the following. 1. Draw a neat labelled diagram of ion exchange process. After treating 50000 litres of water by ion exchanger the cationic resin required 100 litres of 0.2N HCl and anionic resin required 100 Litres of 0.2N NaOH soln. Find the hardness of water.	10

	2. A gaseous fuel has following composition by volume- CH_4 =45%, CO =11%, H_2 =5%, C_3H_8 =12%. Calculate the weight and volume of air required for complete combustion of $3m^3$ of fuel. 3. How to remove moisture and sulphur content from crude oil? Give six advantages of catalytic cracking.	
Q. 3	Attempt any **Two** questions out of the following. 1. With respect to polylactic acid explain the following- a) Synthesis b) Properties (Four) c) Two applications 2. Which moulding method is used for continuous moulding of material like wires? Explain it with suitable diagram. 3. Why it is needed to design chemicals and products to degrade after use? Also explain, how to minimize potential for accidents?	10
Q. 4	Attempt any **Two** questions out of the following. 1. What are conductometric titrations? Give four advantages and two limitations of conductometric titrations. 2. Explain use of fingerprint region of IR spectrum. Give the IR frequency in wavenumbers for following functional groups. a) =C-H (alkene C-H) b) –C=O (carbonyl) c) C-O (ether) 3. A sample of coal contains C = 72%, O = 22%, S = 3.5%, N = 0.2% and Ash = 0.3%. If NCV of coal is 6213.02KCal/Kg. Calculate % H and GCV.	10