VIT
Vellore Institute of Technology

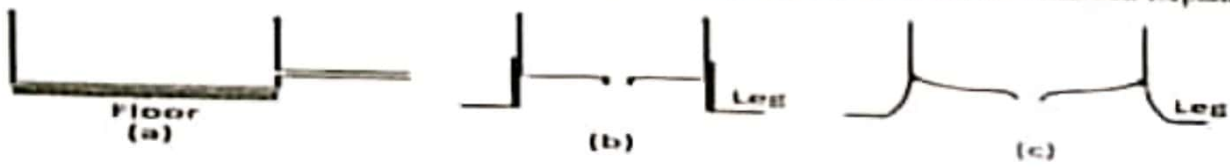
SCHOOL OF ADVANCED SCIENCES
B. Tech./M.Tech– Winter Semester 2018-19
Continuous Assessment Test–II, March 2019

Course Code	: CHY1701	Duration	: 90 min.
Course name	: Engineering Chemistry	Max. Marks	: 50
Semester	: Winter Semester 2018-19	Slot	: A2+TA2

Instructions: Students are allowed to carry their self-hand written note books/papers to th examination hall.

Answer ALL the Questions. (10 x 5 = 50M)

1. Identify from the following three choices, the best design of mild steel water drain out. Explain.



2. Discuss the types of metal oxide (MO) films and explain the features of the metal oxide film from the table.

Volume ratio for some oxides with reference to metal						
K_2O	Na_2O	MgO	Al_2O_3	NiO	Cu_2O	Cr_2O_3
0.41	0.58	0.79	1.38	1.60	1.70	2.03

3. When zinc metal is dipped in 1 N H_2SO_4, the initial rate of generation of hydrogen gas is quite slow Upon the addition of copper chips contacting the zinc metal the rate of hydrogen gas generation increases significantly. Explain the reason behind the increase in hydrogen gas generation rate.

4. An implantable device like a pace-maker which supports proper heart beat draws about 10–20 microamperes (μA) from a battery and lasts for 5–10 years. Identify the type of battery and discuss chemistry.

5. A metal alloy to be fabricated for processing chambers needs to be coated with a thin film of SiO_2 that would enable a glassy finish with excellent electrical insulation and wear resistance. Explain the process involved in this advanced coating technique mentioned above with a neat diagram and equations.

6. Recently, Ni-Cd battery(a conventional rechargeable battery) industries were shut down due to environmental and fire safety regulatory authorities. As an engineer, what alternative will you suggest? Explain the working of the suggested battery.

10. The household mirror has a thin metal coating on the glass to form a reflective interface. Can you suggest suitable techniques to make it and explain with diagrams?