

**VIT[®]****Vellore Institute of Technology**
(Deemed to be University under section 3 of UGC Act, 1956)

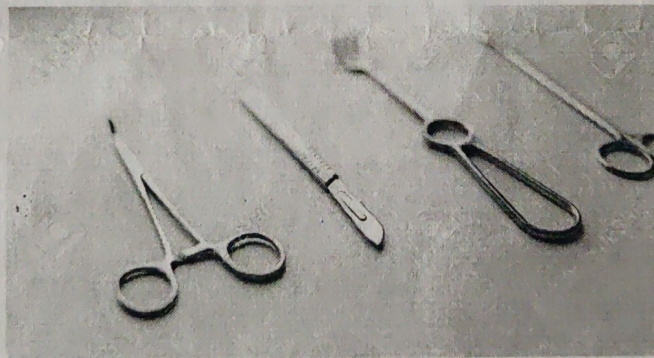
SCHOOL OF ADVANCED SCIENCES
B. Tech./M.Tech - Semester- I
Continuous Assessment Test-II, September 2018

Course Code	: CHY1701	Duration	: 90 min.
Course name	: Engineering Chemistry	Max. Marks	: 50
Semester	: FALL 2018-2019	Slot	: E1

Instructions: Students are allowed to carry their self-hand written note books/papers and prescribed text books or their photo copies to the examination hall.

Answer ALL the Questions

1. Predict the nature of oxide film formed with following oxides: NiO, MoO₃, Fe₂O₃, BaO and Na₂O using Pilling-Bedworth rule.
2. Envisage the anodic and cathodic reactions during the rusting of an iron bar in different environmental conditions such as (i) acidic medium and (ii) neutral medium.
3. Identify the types of corrosion processes and suitable methods to prevent the corrosion in the following cases: (i) railway tracks and (ii) water geyser.
4. The surgical equipment shown in the picture is coated with a hard material such as Titanium carbonitride (TiCN) for maintaining the sharpness for several cycles. Identify a suitable coating process and explain the process with a neat diagram.

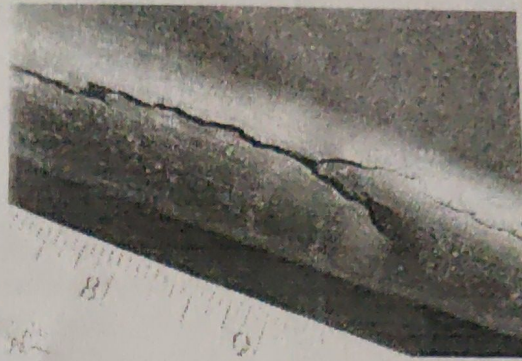


5. If the coating of metallic Copper needs to be done on a printed circuit board for proper electrical contact through holes and the circuit, which method of coating is preferable? Explain the chemistry involved in the process.
6. Ford Car manufacturing unit has different metal forming dies for all the metallic parts of the cars. Each one of the dies is guaranteed for manufacture of 50,000 components each. What type of coating they would have given to these dies? Explain the process with a neat diagram.

7. In the pictures given below, identify the type of corrosion taking place in the metallic objects. Explain the probable reasons and suggest the suitable methods to avoid such corrosion processes.

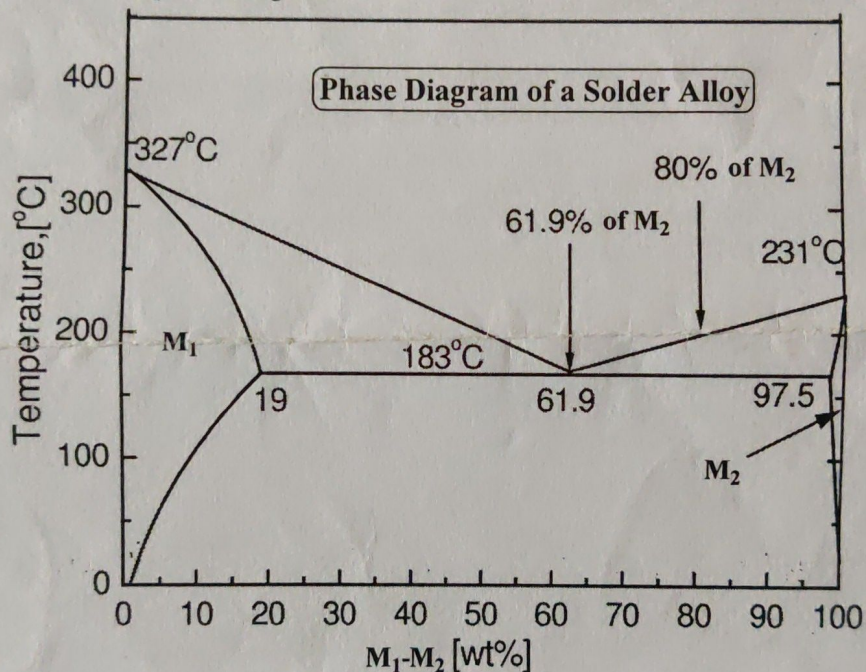


(a)



(b)

8. The picture given below shows the phase diagram of a solder alloy. Identify the different phases of M_1 and M_2 , Eutectic point and Eutectic composition of this alloy. What is the inference from this phase diagram?



9. Assume that Government of India is going to allot some places for establishing iron manufacturing company in the coastal area and arid area. As a corrosion engineer, what factors you would consider to choose the appropriate place for minimizing the rate of corrosion.
10. Reason out the following :
- The rate of corrosion increases when the anode size is smaller than cathode.
 - Corrosion occurs under a rivet compared to other parts in a fabricated metallic device.
 - Half-filled steel water tank shows corrosion at the water line.