



Reg. No.

## INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

### IV SEMESTER B.S. DEGREE EXAMINATION - APRIL / MAY 2017

SUBJECT: PROCESS PLANT MATERIALS (CHM 241)

(BRANCH: CHEMICAL)

Saturday, 29 April 2017

Time: 3 Hours

Max. Marks: 100

- ✓ Answer ANY FIVE full Questions.
- ✓ Draw diagrams and equations wherever necessary.

- 1A. Acid solution containing ferric ions is more corrosive than pure acid solution. Discuss.
- 1B. Explain the mechanism of crevice corrosion that takes place between metallic and non-metallic surfaces.
- 1C. Discuss with a neat diagram, the passivity effect in metals (4+10+6)
- 2A. Write short notes on inlet tube corrosion and impingement occurring in the case of erosion corrosion.
- 2B. List out the differences between anodic and cathodic protection provided for protecting steel structures.
- 2C. All systems that show pitting attack are particularly susceptible to crevice corrosion. But the reverse is not true. Justify the statement.
- 2D. Discuss the Pilling-Bedworth ratio for different metals required for forming protective layer. (6+6+4+4)
- 3A. Explain any five combinations of metal-corrosive environment which are used for the protection from corrosion.
- 3B. Define the properties: Elasticity, stiffness, resilience, plasticity, fatigue
- 3C. Explain the Vicker's Diamond test for finding the hardness of a material. (10+5+5)
- 4A. With the help of a neat diagram, explain the method used for creep testing of materials.
- 4B. Discuss the magnetic particle test used for finding the internal structure and defects in the metal. (10+10)
- 5A. Discuss the working of different types of rolling machines used in cold rolling of metal.
- 5B. Explain the various types of drawing processes for shaping of the metals. (10+10)
- 6A. Distinguish between fibre reinforced plastics and glass fibre reinforced plastics.
- 6B. Compare and contrast silica glass, borosilicate glass and soda lime glass.
- 6C. Discuss the step by step procedure used for producing natural rubber. (5+9+6)

- 7A. With a neat diagram explain the process of injection moulding used in shaping of polymeric material.
- 7B. Distinguish between electrochemical series and galvanic series.
- 7C. Write short notes on stonewares. **(10+4+6)**
- 8A. Discuss wood as a material of construction.
- 8B. Distinguish between low alloy steel and high alloy steel.
- 8C. Write short notes on super alloys. **(6+8+6)**

