



## INTERNATIONAL CENTRE FOR APPLIED SCIENCES (Manipal University) IV SEMESTER B.S. DEGREE EXAMINATION – MAY 2016 SUBJECT: PROCESS PLANT MATERIALS (CHM 241) (BRANCH: CHEMICAL) 23<sup>RD</sup> MAY, 2016

## Time: 3 Hours

Max. Marks: 100

- ✓ Answer ANY FIVE full Questions.
- ✓ Draw diagrams and equations wherever necessary.
- 1A. Justify the statement –"Corrosion is considered as extractive metallurgy in reverse'.
- 1B. Explain the mechanism of pitting corrosion which is considered as self stimulating and self propagating process.
- 1C. Underground pipelines subjected to hazardous chemicals undergoes graphitization. Explain the mechanism.

(5+10+5=20 marks)

- 2A. Discuss the cathodic protection of multiple structures in petroleum industries using stray current effects.
- 2B. Discuss the mechanism of high temperature oxidation (dry corrosion) with the help of reactions.
- 2C. Explain the effect of velocity on corrosion rate.

(8+6+6=20 makrs)

- 3A. With the help of stress-strain diagram, explain the conventional and true stress strain relation.
- 3B. Explain the properties: toughness, hardness, resilience, elasticity, plasticity
- 3C. Discuss the Rockwell test used for determining the hardness of a material. (2+5+7-2)

(8+5+7=20 marks)

- 4A. Describe the Charpy test and Izod test used for determining the brittleness.
- 4B. With a neat diagram, discuss the Wohler system of calculating the fatigue.

(10+10=20 marks)

- 5A. Explain the working of extrusion equipments used for the fabrication of metals.
- 5B. Write short notes on powder technology.
- 5C. Discuss the working mechanism of cold working process.

(10+5+5=20 marks)

- 6A. Distinguish between unplasticised and plasticized polyvinyl chloride.
- 6B. Discuss the step by step procedure used for applying rubber lining on process vessels.
- 6C. Describe the two methods used for glass lining on process vessels.

(6+8+6=20 marks)

- 7A. With a neat diagram explain the process of compression moulding used in shaping of plastic material.
- 7B. Explain the importance of distance and area effects in the case of galvanic corrosion.
- 7C. List out the uses of asbestos as material of construction.

(10+6+4=20 marks)

- 8A. Write short notes on cement and concrete as a material of construction.
- 8B. List out the different types of ceramic materials and their uses.
- 8C. Explain the effect of elements silicon, tungsten, chromium and nickel on the alloy composition.

(6+6+8= 20 marks)

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