Reg. No. : | | | | | | | | | | | | |

# J 3706

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

First Semester — Annual pattern

Civil Engineering

CY 1 X 01 — ENGINEERING CHEMISTRY

(Common to all branches (Except Marine Engineering))

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. What is Moh's scale? Name the hardest substance known.

2. What types of lubricants are used for machineries under high pressures and low speeds?

3. What is the effect of increase of temperature on the adsorption of a gas on a solid surface?

4. What is the difference between critical point and triple point?

5. Galvanized containers are not used for storage of food products, but tin coated containers are used. Give the reason.

6. What do you understand by acid - pickling?

7. Calgon treatment prevents scale - formation in boilers. Give the reason.

8. What do sub-critical and super-critical size indicate in a nuclear fission reaction?

9. Mention two disadvantages of using alcohol-gasoline blends in I.C. engine.

10. How many normal modes of vibration do you expect from

(a) $CO_2$

(b) $SO_2$

(c) $CHCl_3$ ?

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) What are soft abrasives? Give examples. (4)

(ii) Discuss four essential properties of a good refractory material. (4)

(iii) Give the composition, characteristics and application of fire clay refractory. (8)

Or

(b) (i) Discuss the significance of viscosity in lubricating oil. How is it determined? (10)

(ii) Discuss with the help of a neat sketch the injection moulding of plastics (6)

12. (a) (i) What are the limitations of Freundlich adsorption isotherm? How are they removed in langmuir's isotherm? (8)

(ii) What type of eutectic system is applicable for Pattison's desilverisation process? Discuss in detail. (8)

Or

(b) (i) What are non ferrous alloys? (4)

(ii) Give the composition, properties and uses of some important non ferrous alloys. (12)

13. (a) (i) Discuss the mechanism of wet corrosion. (6)

(ii) Explain the difference in the use of anodic and cathodic coatings for corrosion prevention. (6)

(iii) Write a note on corrosion inhibitors. (4)

Or

(b) (i) What are the different constituents and functions of paints? (6)

(ii) Write a note on temperature indicating paints. (4)

(iii) What are the advantages and applications of electroless nickel plating? (6)

14. (a) (i) How are different boiler scales formed? Discuss their remedial measures. (8)

(ii) Write a note on reverse osmosis. (8)

Or

(b) (i) Give a brief amount of nuclear power plant. (6)

(ii) What are secondary batteries? Give two examples for them. (4)

(iii) Discuss the principles and applications of solar cells. (6)

15. (a) (i) What is meant by cracking of petroleum? Explain fluidized bed catalytic method of obtaining gasoline. (8)

(ii) Describe the manufacture of metallurgical coke by Otto Hoffmann's oven method. (8)

Or

(b) (i) Discuss the principle and working of flame photometer (Give only block diagram). How do you estimate sodium?

(ii) How do you estimate iron using a colorimeter.