

**Diploma in Civil Engineering / Diploma
in Electrical & Mechanical Engineering**

Term-End Examination

June, 2007

BET-013 : CHEMISTRY

Time : 2 hours

Maximum Marks : 70

Note : Question no. 1 is **compulsory**. Answer any **four** questions from Questions no. 2 to 8. All questions carry equal marks.

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1. (a) Write down the electronic configuration for Mg and Oxygen ion (O^{2-}). 2
 - (b) Give oxidation states of nitrogen in NO_2 and HNO_2 ? 2
 - (c) Define alloys and give two examples. 2
 - (d) Differentiate between cohesion and adhesion. 2
 - (e) Differentiate between net calorific value and gross calorific value. 2
 - (f) State whether nylon 6,6 is a product of condensation polymer or an addition polymer and why. 2
 - (g) Name any four colouring materials of glass. 2

2. (a) Explain the variation of the following periodic properties :
- (i) Atomic Radii
 - (ii) Metallic character
 - (iii) Ionization energy
- (b) Describe the preparation, properties and uses of chlorine.
3. (a) Explain the Ostwald process for the production of nitric acid.
- (b) How do you extract aluminium from its ores ?
- (c) Why are brass and duralumin termed as alloys ? Give their constituents and usage.
4. (a) Describe the Zeolite process to remove water hardness.
- (b) What do you mean by sludge and scale formation in boilers ? List disadvantages of sludge formation.
- (c) List different methods of prevention of scale formation in boilers and explain carbonate conditioning method.
5. (a) Give details of Beehive oven process to manufacture metallurgical coke.
- (b) Name the processes involved in refining of petroleum. Describe fractional distillation process.
- (c) What is water gas ? How is it prepared ? List its usage.

6. (a) What are the functions of a lubricant ? 2
(b) What are lubricating emulsions ? Give their usage. 4
(c) How do you determine the flash and fire point of a lubricant ? 6
(d) Define aniline point of a lubricant. 2
7. (a) Explain cationic polymerization. 4
(b) How is ammonia prepared by Haber – Bosch process ? Give its various usages in industries. 6
(c) What do you understand by the moulding of plastics ? 4
(d) Give details of silica refractory bricks. 4
8. (a) What are ceramics ? 2
(b) Write about the manufacturing of a glass. 4
(c) Why is glazing of ceramics required ? List different methods of glazing. 4
(d) Give details of silica refractory bricks. 4

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