No. of Printed Pages : 3

BET-013

00184

Diploma in Civil Engineering / Diploma in Electrical & Mechanical Engineering

Term-End Examination

June, 2011

BET-013 : CHEMISTRY

Time : 2 hours *Maximum Marks : 70*

Note : 1. *Question number* **1** *is* ***compulsory.***

2. *Answer any other* ***four*** *questions from question numbers* **2** *to* **8.**

3. *All questions carry* ***equal*** *marks.*

---

1. (a) Write down the electronic configuration of $_{17}Cl$ and $_{29}Cu$. **2**

(b) What are the oxidation states of nitrogen in NO and NH_3 ? **2**

(c) Arrange the following in the increasing order of their size. **2**

Na, Na^+ and Mg^{2+}.

(d) Complete the following equation. **2**

$$^{6}_{3}Li + (\_\_\_) \longrightarrow {}^{3}_{1}H + {}^{4}_{2}He$$

(e) Which of these elements form a set of triad : **2**

Na, Cl, K, Br, Mg, I

(f) Which isotopes of hydrogen is radioactive ? **2**

(g) Complete the following equation. **2**

$$CO(g) + H_2O(g) \xrightarrow[400^\circ C]{Fe_2O_3} \_\_\_\_\_$$

2. (a) Give details of *any two* :

(i) What is the similarity between Na^+, F^- and Mg^{2+} ? and which among them has the smallest size and why ? 4

(ii) Explain reasons of changes in Ionisation Energy and Atomic Radii in a group and a period. 4

(iii) What do you mean by the term Nitrogen fixation ? Give the structure of hydrazine. 4

(b) What do you mean by hardness of water ? Explain in detail about any one of the methods of the removal of temporary hardness of water. 6

3. (a) How can oxygen be prepared in laboratory ? List out its important properties. 8

(b) Explain Haber Process for the preparation of ammonia. 4

(c) What are the main uses of nitrogen ? 2

4. (a) Explain in detail the preparation of chlorine in laboratory and list out its important uses. 8

(b) What do you mean by atmosphere ? What are the major components and their percentages in the air that we inhale ? 4

(c) Name two important zones of atmosphere and write one sentence each about them. 2

5. (a) Enlist different sources of water ? 2

(b) Briefly describe the hydrological cycle. 4

(c) What are the main causes for the formation of scales in Boilers ? 4

(d) How can the scale formation be prevented in boilers ? 4

6. (a) What is the difference between primary and secondary fuels ? Give an example each for both. 2

(b) What are the characteristics of good fuels ? 4

(c) Explain preparation of metallurgical coke using Behive Oven Process. 4

(d) Explain the process of fractional distillation for refining of petroleum. 4

7. (a) What are the important functions of lubricants ? List out the merits of solid lubricants. 6

(b) What is meant by flash point and Fire point of an oil ? Name the apparatus used for their determination. 4

(c) Define cationic polymerization. Explain initiation and propagation steps in cationic polymerisation. 4

8. (a) What is meant by thermoplastics and setting polymers ? 4

(b) Explain the important methods used for protection against brittle fracture of glass. 4

(c) List any eight properties of refractories. 4

(d) What is bleaching powder ? Name the plant used for the manufacture of bleaching powder. 2