01312

No. of Printed Pages : 4

BET-013

DIPLOMA IN CIVIL ENGINEERING DCLE(G) / DIPLOMA IN MECHANICAL ENGINEERING (DME) / DCLEVI / DMEVI / DELVI / DECVI / DCSVI / ACCLEVI / ACMEVI / ACELVI / ACECVI / ACCSVI

Term-End Examination

December, 2015

BET-013 : CHEMISTRY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer any **five** questions. Question number 1 is **compulsory**. All questions carry equal marks.*

1. (a) Write the electronic configuration of $_{20}Ca$ and $_{29}Cu$. 2

(b) What is modern periodic law ? 2

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

Na, Na^+, Mg^{++}

(d) Explain, why the second ionisation energy is generally larger than the first ionisation energy. 2

(e) Write the names of the monomers given below : 2

(i) $CH_2 = CH_2$

(ii) $CH_2 = CHCl$

(f) Which one among O and O^{2-} is larger and why ? 2

(g) Ice has a lower density than water. Explain. 2

2. (a) Explain, why atomic radii increase down a group while they decrease in a period from left to right. 4

(b) What happens to the effetive nuclear charges while moving along a period from left to right ? Give reasons. 4

(c) (i) What is meant by hydrological cycle ? What is the potential use of surface run-off ? 4

(ii) Calculate the oxidation state of nitrogen in the following compounds : 2

HNO_3 and N_2H_4

3. (a) (i) What are the important ores of iron ? 2

(ii) Describe the Open Hearth Process **or** Basic Oxygen Process for the preparation of steel from iron. 4

(b) (i) A water sample contains 100 ppm of calcium ions. Calculate the percentage of $CaCO_3$ in the water sample. 4

(ii) How can the scales be removed from a boiler ? 4

4. (a) Explain the important internal conditioning methods useful in reduction and prevention of scale formation in a boiler. 6

(b) (i) Describe the manufacturing of coke by Beehive Oven Process **or** Otto Hoffmann's Byproduct Oven Process. 4

(ii) What is the difference between primary and secondary fuels ? 2

(iii) What are the characteristics of a good fuel ? 2

5. (a) (i) What is a lubricant ? 2

(ii) Write the merits and demerits of semi-solid lubricants. 4

(b) How is Viscosity Index (VI) measured ? 4

(c) Describe any ***two*** of the following steps in polymerisation : 4

(i) Chain initiation

(ii) Chain propagation

(iii) Chain termination

6. (a) Describe any two methods for moulding of plastics. 4

(b) (i) What is glass wool ? 2

(ii) List five important properties and uses of glass wool. 4

(c) Write a short note on any ***one*** of the following : *4*

(i) Silica Bricks

(ii) Carbon Bricks

(iii) Blending of Clay

7. (a) Define Flash Point, Fire Point and Power Point. *6*

(b) Explain Bomb Calorimetric method for determination of calorific value. *4*

(c) How are refractory materials classified ? *4*

8. (a) (i) What is bleaching powder ? *2*

(ii) Explain the commercial methods of the manufacturing of bleaching powder and formation of chloroform from bleaching powder. *4*

(b) Write short notes on any ***two*** of the following : *2×4=8*

(i) Thermosetting Plastics

(ii) Peat

(iii) Biogas

(iv) Electro-dialysis