* 6054 *

C16–M–104/C16–CHOT–104/C16–RAC–104

6054

BOARD DIPLOMA EXAMINATION, (C–16)

OCT/NOV—2017

DME—FIRST YEAR EXAMINATION

ENGINEERING CHEMISTRY AND ENVIRONMENTAL STUDIES

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write three differences between oxidation number and valency.

2. Define Hund's rule. Explain with an example.

3. Define saturated, unsaturated and supersaturated solutions.

4. Define pH. Calculate the pH of 0·01 *M* HCl solution.

5. Write any three differences between metallic conductors and electrolytic conductors.

6. Write the names and chemical formula of salts which cause temporary and permanent hardness.

7. Write the method of processing of natural rubber from latex.

8. What are primary and secondary fuels? Give one example each.

9. Define pollutant, receptor and sink.

10. Write a short note on greenhouse effect.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Write briefly about quantum numbers. 6

(b) Define ionic bond. Explain the formation of NaCl. 4

12. *(a)* Define normality. Calculate the weight of Na_2CO_3 present in 500 ml of 0·02 *N* solutions (GMW of Na_2CO_3 106). 5

(b) Explain Lewis theory of acids and bases and give three limitations. 5

13. *(a)* Define *(i)* gangue, *(ii)* flux, *(iii)* slag and *(iv)* ore. Give one example each. 4

(b) Write the composition and uses of *(i)* brass, *(ii)* German silver and *(iii)* nichrome. 6

14. *(a)* Define EMF of a cell. Calculate EMF of the following cell : 5

$$Zn / Zn^{2}(1M) / / Cu^{2}(1M) / Cu$$

Standard reduction potential of Zn 0 78 V and Cu 0 34 V.

(b) Explain the electrolysis of fused NaCl. 5

15. *(a)* Define corrosion. Write any five factors which influence the rate of corrosion. 6

(b) Explain protection of metals by sacrificial anode method with neat diagram. 4

16. *(a)* Explain softening of hard water by ion-exchange process with neat diagram. 6

(b) State any four essential qualities of drinking water. 4

17. *(a)* Write the preparation method and uses of *(i)* polythene, *(ii)* PVC and *(iii)* teflon with chemical equations. 6

(b) What is vulcanization of rubber? Explain with chemical equations. 4

18. *(a)* Define water pollution. Explain any five causes of water pollution. 6

(b) What is biodiversity? Give any three threats to biodiversity. 4

★ ★ ★