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C09–A–104/C09–AA–104/C09–AEI–104/C09–C–104/
C09–CM–104/C09–CHST–104/C09–EC–104/C09–EE–104/
C09–FW–104/C09–IT–104/C09–M–104/C09–MET–104/
C09–MNG–104/C09–PKG–104/C09–TT–104

3004

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2018

FIRST YEAR (COMMON) 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. Define covalent bond. Give an example.

2. Write three differences between oxidation number and valency.

3. Define equivalent weight of a base. Give expression for it.

4. What are the limitations of Arrhenius acid-base theory.

5. Define e.m.f. of a cell. The standard reduction potentials of Mg and Cd electrodes are –2·37 V and –0·40 V respectively. Calculate e.m.f. of the cell, Mg/Mg^{2} (1M)//Cd^{2} (1M)/Cd.

6. Distinguish between temporary hardness and permanent hardness of water.

7. Write six characteristics of vulcanized rubber.

8. Give the compositions and two uses of *(a)* acctylene gas and *(b)* producer gas.

9. Define the following giving examples :

(a) Producers

(b) Consumers

10. Define the following :

(a) Air pollution

(b) Primary pollutants

(c) Secondary pollutants

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)* State the postulates of Bohr's atomic theory. 6

(b) Define orbital. Draw the shapes of *s* and *p*-orbitals. 4

12. *(a)* Define the terms : *(i)* mineral, *(ii)* ore, *(iii)* gangue, *(iv)* flux and *(v)* slag. 5

(b) Explain electrolytic refining of a metal. 5

13. *(a)* Explain electrolysis of fused NaCl with a diagram and relevant chemical equations. 6

(b) State Faraday's laws of electrolysis. 4

14. *(a)* What is rust? Explain the mechanism of rusting of iron with chemical equations. 6

(b) Explain any two types of protective coatings used in prevention of corrosion. 4

15. *(a)* Explain the municipal method of treatment of water for drinking purpose with a neat diagram. 7

(b) What is reverse osmosis? Mention two advantages. 3

16. *(a)* Define and explain addition polymerisation and condensation polymerisation with one example each. 6

(b) Write any four advantages of plastics over traditional materials. 4

17. *(a)* Define the terms *(i)* TLV, *(ii)* BOD and *(iii)* COD. 6

(b) What is greenhouse effect? What are its consequences? 4

18. *(a)* Define molarity. Calculate the molarity of 10·6%.(w/v) sodium carbonate solution. 5

(b) Define the following : 5

(i) Ionic product of water

(ii) p^H

(iii) Buffer solution

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