



C09-A-104/C09-AA-104/C09-AEI-104/C09-BM-104/  
C09-CHST-104/C09-FW-104/C09-IT-104/  
C09-MET-104/C09-MNG-104/  
C09-PKG-104/C09-TT-**104**

**3004**

**BOARD DIPLOMA EXAMINATION, (C-09)**  
**OCT/NOV—2014**  
**FIRST YEAR (COMMON) EXAMINATION**

ENGINEERING CHEMISTRY AND  
ENVIRONMENTAL STUDIES

*Time : 3 hours ]*

*[ Total Marks : 80*

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**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. Draw Lewis dot structures for H<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub> molecules indicating sharing of electrons.
2. What are periods and groups in modern periodic table? How many groups and periods are there in modern periodic table?
3. Define equivalent weight of salt. Give expression for it.
4. Define buffer solution. Give an example.

- \* 5. Write any three differences between electrolytic cell and galvanic cell.
6. Define soft water and hard water.
7. Define addition polymerization and condensation polymerization.
8. Define primary and secondary fuels giving one example each.
9. Define the terms BOD and COD.
10. Write a brief note on the use of Cottrell's electrostatic precipitator in the control of air pollution.

**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 Aufbau principle and Pauli's exclusion principle. 4

(b) Write briefly about principal quantum number and azimuthal quantum number. 6

12. (a) Define alloy and write any three properties of alloys. 5

(b) Explain the process of calcination and smelting with examples. 5

\* 13. (a) Define electrolyte and non-electrolyte. Give an example for each. 3

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

(c) Define chemical equivalent and electrochemical equivalent. 3

- \* **14.** (a) Define corrosion. List out the factors which influence the rate of corrosion. 5
- (b) Explain the formation of concentration cell and stress cell. 5
- 15.** (a) Explain ion-exchange process of softening the hard water. 7
- (b) Write a brief note on reverse osmosis with its advantages. 3
- 16.** (a) What is vulcanization of rubber? Explain giving chemical equations. 5
- (b) Write any five characteristics of vulcanized rubber. 5
- 17.** (a) What are the effects of water pollution on living beings? 6
- (b) Write a brief note on renewable and non-renewable energy sources with example. 4
- 18.** (a) Define mole. Calculate the number of moles contained in the following substances : 5
- (i) 90 gm of water
- (ii) 90 gm of glucose
- (iii) 60 gm of carbon
- (b) (i) Define conjugate acid-base pair. Give an example. 3
- (ii) Mention two limitations of Bronsted-Lowry acid-base theory. 2
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