



c09-cm-104

3024

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2013

DCME—FIRST YEAR EXAMINATION

ENGINEERING CHEMISTRY AND  
ENVIRONMENTAL STUDIES

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

- 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. What is an orbital? Draw the shapes of *d*-orbitals.
2. Calculate the oxidation number of—
  - (a) C in  $\text{CO}_2$ ;
  - (b) Cr in  $\text{K}_2\text{Cr}_2\text{O}_7$ ;
  - (c) Fe in  $\text{Fe}_2\text{O}_3$ .
3. What is weight of sodium carbonate required to prepare 2 litres of 0.05 *M* solution?
4. What is conjugate acid-base pair? Explain with one example.

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5. Write any three differences between metallic conductors and electrolytic conductors.
6. What are the characteristics of drinking water?
7. State any six advantages of plastics over traditional materials.
8. Write any six characteristics of a good fuel.
9. What are primary and secondary pollutants? Give examples.
10. What is deforestation? State the reasons for it.

**PART—B**

- 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) Discuss quantum numbers in detail. 8
- (b) Write the values of quantum numbers for 3S electron. 2

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- 12.** (a) How do you find the equivalent weight of acids, bases and salts? Give examples. 5  
(b) Explain Arrhenius theory of acids and bases. 5
- 13.** (a) List any four differences between metals and nonmetals. 4  
(b) Explain the following terms : 6  
(i) Calcination  
(ii) Roasting  
(iii) Smelting
- 14.** (a) State Faraday's 1st law and 2nd laws and explain them. 6  
(b) A Current of 5 ampere is passed through copper sulphate for 30 minutes. Find the weight of copper deposited on cathode. [Atomic weight of Cu = 63.5] 4
- 15.** (a) What is corrosion? Explain any four factors that influence the rate of corrosion. 5  
(b) Explain the process of prevention of corrosion by sacrificial anode method. 5
- 16.** (a) Describe the ion-exchange method for softening of hard water. 8  
(b) Differentiate between temporary hardness and permanent hardness. 2
- 17.** (a) Explain addition polymerization and condensation polymerization with one example each. 6  
(b) Give any four differences between thermoplastics and thermosetting plastics. 4
- 18.** (a) Write a note on global warming. 4  
(b) What is water pollution? Explain any three causes of water pollution. 6

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