



C16-M-104

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BOARD DIPLOMA EXAMINATION, (C-16)
MARCH/APRIL—2018
DME—FIRST SEMESTER EXAMINATION

ENGINEERING CHEMISTRY AND
ENVIRONMENTAL SCIENCE—I

Time : 3 hours]

[Total Marks : 80

PART—A

2×15=30

- Instructions** : (1) Answer *any fifteen* questions.
(2) Each question carries **two** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define atomic number and atomic mass number.
2. Draw the shapes of *s* and *p* orbitals.
3. Write the electronic configurations of Al and Ca.
4. Define reduction and give one example.
5. Write any two differences between ionic and covalent compounds.
6. Define solute and solvent.
7. Define solubility and saturated solution.
8. Calculate the number of moles of HCl present in 73 grams of HCl.

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9. Define ^{*}equivalent weight.
10. What is conjugate acid-base pair? Give one example.
11. State any two limitations of Lewis theory of acids and bases.
12. Define ionic product of water. What is its value at 25 °C?
13. Calculate the pH of 0.001 M NaOH solution.
14. Define soft water and hard water.
15. List out the chemicals that cause temporary hardness to water.
16. Define degree of hardness and mention any one unit.
17. Define reverse osmosis.
18. Define pollutant and threshold limit value.
19. Define ecosystem and mention any two biotic components of ecosystem.
20. Define producer and consumer.

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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.

21. State the postulates of Bohr's atomic theory and mention any three limitations. 10
22. (a) Write about principal and magnetic quantum numbers.
(b) Explain Pauli's exclusion principle and Hund's rule. 5+5

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- 23.** (a) ^{*} Define ionic bond. Explain the formation of ionic bonding in MgO.
- (b) Define oxidation state and calculate the oxidation state of Cr in $K_2Cr_2O_7$. 5+5
- 24.** (a) Classify the solutions based on their physical states.
- (b) Define molarity. Find out the weight of Na_2CO_3 required to prepare 250 ml of 0.02 M Na_2CO_3 solution. 5+5
- 25.** (a) Define acid, base and salt as per Arrhenius theory of acids and bases. Give one example for each.
- (b) Define buffer solution. State any two applications of buffer solutions. 6+4
- 26.** (a) Mention any four disadvantages of using hard water in industries.
- (b) Explain the Permutit process of softening of hard water. 4+6
- ^{*}
- 27.** (a) Write any four essential qualities of drinking water.
- (b) Explain municipal treatment of water for drinking purpose. 4+6
- 28.** (a) Explain renewable and non-renewable energy sources with examples.
- (b) Define biodiversity and mention any four threats to biodiversity. 5+5
