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C09–A–104/C09–AA–104/C09–AEI–104/C09–BM–104/
C09–C–104/C09–CM–104/C09–CHPP–104/C09–CHPC–104/
C09–CHOT–104/C09–CHST–104/C09–EC–104/C09–EE–104/
C09–IT–104/CO9–M–104/C09–MET–104/C09–MNG–104/
C09–PET–104/C09–TT–104/C09–RAC–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. State and explain Aufbau's principle.

2. Define oxidation and reduction. Give examples.

3. Calculate the weight of sodium carbonate (mol. wt. 106) dissolved in 500 ml of 0·05 *N* solution.

4. What is conjugate acid base pair? Give the conjugate acid and base of H_2O.

5. Give the differences between thermoplastics and thermosetting plastics.

6. A sample of water contains following salts :

$Mg(HCO_3)_2$ = 23 ppm, $CaCl_2$ = 33·3 ppm, $MgSO_4$ = 30 ppm

Calculate the total hardness of water.

7. Write about Arrhenius theory of electrolytic dissociation.

8. Write the composition and uses of coal gas and water gas.

9. Define the terms *(a)* ecosystem, *(b)* biodiversity and *(c)* COD.

10. Write a short note on acid rain.

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 the valuation is the content but not the length of the answer.

11. *(a)* State modern periodic law. Explain the salient features of modern periodic table. 7

(b) List the properties of the ionic compounds. 3

12. *(a)* Give the equations to calculate the equivalent weights of acids, bases and salts. Give one example in each case. 6

(b) Calculate the pH and pOH of 0·00005*M* NaOH solution. 4

13. *(a)* Define alloy. Give two examples of alloys. What are the properties of alloys? 5

(b) Describe the concentration of ore by froth floatation process. 5

14. *(a)* Explain the prevention of corrosion by sacrificial anode method. 6

(b) Define corrosion. Mention any six factors influencing the rate of corrosion. 4

15. *(a)* Explain the softening of hard water by ion-exchange method with a neat labelled diagram. 6

(b) Explain reverse osmosis. What are the advantages of it? 4

16. *(a)* Write the preparation and uses of *(i)* teflon, *(ii)* urea formaldehyde and *(iii)* neoprene. 6

(b) Define the terms *(i)* monomer, *(ii)* polymer, *(iii)* plastic and *(iv)* elastomer. 4

17. *(a)* State and explain Faraday's laws of electrolysis. 6

(b) Give the differences between the electrolytic cells and galvanic cells. 4

18. *(a)* Define pollutant. What are primary and secondary pollutants? Give examples. 5

(b) Explain the effects of water pollution. 5

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