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C09–A/AA/AEI/BM/C/CM/
CHPP/CHPC/CHOT/CHST/EC/EE/IT/
M/MET/MNG/PET/TT/RAC–104

3004

BOARD DIPLOMA EXAMINATION, (C–09)

SEPTEMBER/OCTOBER - 2020

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. Draw the shapes of *s*, *p*, *d* orbitals.

2. Define orbit and orbital.

3. Define solute, solvent, solution.

4. What is buffer solution? Give example.

5. What is electrolyte and non-electrolyte?

6. Define hard water and soft water.

7. Write three advantages of plastics over traditional materials.

8. Write three characteristics of good fuel.

9. Explain greenhouse effect.

10. What are primary pollutants and 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 the valuation is the content but not the length of the answer.

11. *(a)* Explain postulates of Bohr's atomic theory. 7

(b) Explain Aufbau's principle. 3

12. *(a)* Calculate the molarity of 500 ml solution containing 4 grams of sodium hydroxide (GMW = 40). 5

(b) Explain Bronsted-Lowry theory of acids and bases. Give examples. 5

13. *(a)* Write five differences between metals and non-metals. 5

(b) Write the composition and uses of German silver and nichrome. 5

14. *(a)* Explain Faraday's laws of electrolysis. 6

(b) A current of 0·5 ampere is passed through a solution of $CuSO_4$ for 20 minutes using platinum electrodes. Calculate the amount of copper deposited (atomic weight of copper = 63·5). 4

15. *(a)* Define corrosion. Explain the mechanism in rusting of iron. 5

(b) Explain the method of prevention of corrosion by sacrificial anode method. 5

16. *(a)* What is degree of hardness? What is PPM? 3

(b) Explain the method of softening of water by ion-exchange process. 7

17. *(a)* Explain addition polymerisation and condensation polymerisation with examples. 6

(b) Write the uses of polyethylene and PVC. 4

18. *(a)* Explain the causes of air pollution. 5

(b) Explain the causes of water pollution. 5

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