



C14-A/AA/CHST/AEI/FW/MET/MNG/IT/TT/
PKG/C/EC/EE/M/CM-104

4004

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH / APRIL - 2019

FIRST YEAR EXAMINATION

ENGINEERING CHEMISTRY & ENVIRONMENTAL STUDIES

Time : 3 Hours]

[Total Marks : 80

PART - A

4×10=40

- Instructions :**
- (1) Answer **ALL** questions.
 - (2) Each question carries **FOUR** marks (Two marks for each bit).
 - (3) Answer should be brief and straight to the point and shall not exceed five simple sentences.

- 1 (a) State two differences between orbit and orbital.
(b) Name the four quantum numbers that characterise an electron in an atom.
- 2 (a) Draw the shapes of s and p-orbitals.
(b) Calculate the Oxidation Number of the Mn in KMnO_4 .
- 3 (a) Define Molarity and give its mathematical expression.
(b) Calculate the number of moles present in 1 Kg of Sodium Hydroxide (NaOH).
- 4 (a) What is Conjugate Acid - base pair ? Give an example.
(b) What are buffer solutions? Give two examples.
- 5 (a) Define the electrochemical equivalent (e) and give its expression.
(b) The SRP of Mg and Cd electrodes are -2.37V and -0.40V respectively. Calculate the EMF of the Cell $\text{Mg}/\text{Mg}^{2+} // \text{Cd}^{2+}/\text{Cd}$.

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[Contd...

- 6 (a) Define degree of hardness of water. Write its two units.
(b) Calculate the hardness of a Sample of water containing 13.6 mg of CaSO_4 per liter.
- 7 (a) Write flow diagram of processing of natural rubber from latex.
(b) State any four advantages of plastics over traditional materials.
- 8 (a) Mention any four advantages of gaseous fuels.
(b) State the composition and two uses of water gas.
- 9 (a) What are primary and secondary pollutants? Give examples.
(b) Define the terms (i) particulates (ii) receptor.
- 10 (a) What is deforestation? Mention two reasons for deforestation.
(b) Define producers and consumers. Give examples.

PART - B

10×4=40

Instructions :

- (1) Answer any **FOUR** questions.
- (2) Each question carries **TEN** marks.
- (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11 (a) Define Ionic bond. Explain the Ionic bond formation in sodium chloride. **6**
- (b) Explain anomalous electronic configuration of chromium ($z=24$) and copper ($z=29$). **4**
- 12 (a) Define Normality. Calculate the Normality of 2 liters H_2SO_4 solution containing 9.8 grams of H_2SO_4 (G.M.Wt of $\text{H}_2\text{SO}_4 = 98$) **5**
- (b) Explain Lewis theory of Acids and bases. **5**

- 13** (a) Define the terms : **5**
(i) Ore
(ii) Mineral
(iii) Gangue
(iv) Flux and
(v) Slag
- (b) What are alloys? Give the composition and uses of **5**
(i) Brass and
(ii) German silver.
- 14** (a) State and explain Faraday's laws of electrolysis. **5**
(b) A current of 0.5 amp. is passed through molten AlCl_3 for **5**
96.5 seconds. Calculate the mass of Al deposited on the
cathode (At. Wt. of Al = 27)
- 15** (a) State any six factors influencing the rate of corrosion. **6**
(b) Explain impressed voltage method of prevention of corrosion. **4**
- 16** (a) Distinguish between temporary hardness and permanent **4**
hardness of water.
(b) Explain permutit process of softening hard water with a **6**
neat diagram and chemical reactions.
- 17** (a) Write a method of preparation and two uses each of **5**
the following
(i) PVC (ii) Polythene
(b) What is vulcanization? Explain with equations. **5**
- 18** (a) What is water pollution? Discuss any four causes of water **6**
pollution.
(b) State the types of energy sources available with examples. **4**
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