C16/A/AA/CHST/C/CM/EC/EE/M/AEI/
MET/MNG/IT/TT/PKG-**104**

# 5004

## BOARD DIPLOMA EXAMINATION, (C-16)

MARCH / APRIL - 2019

## FIRST YEAR (COMMON) EXAMINATION

## ENGINEERING CHEMISTRY &

## ENVIRONMENTAL STUDIES

Time : **3** Hours] [Total Marks : **80**

**PART - A** **2×15=30**

***Instructions :*** *(1) Answer any **15** questions.*
*(2) Each question carries **2** marks.*
*(3) Answer should be brief and straight to the point and shall not exceed five simple sentences.*

**1** State and explain Hund's rule.

**2** Write two differences between orbit and orbital.

**3** Calculate the oxidation number of Cr in $K_2Cr_2O_7$, and Mn in $KMnO_4$.

**4** Write any two differences between ionic compounds and covalent compounds.

**5** Define the terms solute and solvent.

**6** Calculate the Equivalent weight of $Na_2CO_3$ and $H_2SO_4$.
(given molecular weight of $Na_2CO_3$ is 106,and molecular weight of $H_2SO_4$ is 98)

7 What is conjugate acid-base pair ? Give an example.

8 Calculate the $P^H$ of 0.001M HCl solution.

9 Define the terms conductor and insulator.

10 Define emf of a cell. Mention its units.

11 Define soft water and hard water.

12 Define Reverse osmosis. Write any two applications of Reverse osmosis.

13 What are the characteristics of plastics ?

14 What is elastomer ? Give an example.

15 Define primary and secondary fuels.

16 Write the composition and uses of water gas.

17 Define the terms pollutant and contaminant.

18 Define water pollution.

19 Define producers and consumers.

20 State the threats to biodiversity.

## PART - B 10×5=50

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

21 (a) Explain the four Quantum numbers with their significance. **8**

(b) Write any two differences between oxidation number and valency. **2**

22 (a) Define Molarity. Find the weight of $H_2SO_4$ required to prepare 400ml of 0.5 M solution. (gram molecular weight of $H_2SO_4$ is 98g) **4**

(b) Explain Arrhenius theory of acids and bases. What are its limitations ? **6**

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| **23** | (a) | Write a short note on froth flotation process. | **5** |
| | (b) | Define the terms "Mineral ","Ore", "Gangue" ,"flux", and "slag". | **5** |
| **24** | (a) | Explain sacrificial anode method with an example. | **4** |
| | (b) | What is rusting of Iron? Explain the mechanism of rusting of Iron with chemical equations. | **6** |
| **25** | (a) | State and explain Faraday's laws of electrolysis. | **6** |
| | (b) | Define galvanic cell. Calculate the E. M. F. of the following galvanic cell. $Mg/Mg^{+2}(1M)$ // $Ag^{+}(1M)/Ag$. (Given standard reduction potentials of Ag is 0.8V and Mg is -2.37V). | **4** |
| **26** | (a) | What are the essential qualities of drinking water. | **4** |
| | (b) | Explain softening of hard water by permutit method. | **6** |
| **27** | (a) | Write any four differences between thermoplastics and thermosetting plastics. | **4** |
| | (b) | Write the preparation method and uses of the following plastics : (i) Teflon (ii) PVC | **6** |
| **28** | (a) | Define air pollution. Write any four causes of air pollution. | **6** |
| | (b) | What is deforestation ? Write any three effects of deforestation. | **4** |