CBSE-2003 CLASS XII CHEMISTRY

General Instructions:

1. All questions are compulsory.
2. Marks for each question are indicated against it.
3. Question numbers **1** to **10** are very short-answer questions each of **1 mark**. Answer them hi about one sentence each.
4. Question numbers **11** to **26** are short-answer questions of **2 marks** each. Answer them in not more than 30 words each.
5. Question numbers **27** to **32** are short-answer questions of **3 marks** each. Answer them in not more than 40 words each.
6. Question numbers **33** and **34** are long-answer questions of **5 marks** each. Answer them in not more than 70 words each.
7. Use Log Tables, If necessary.

Note: Except for the following questions, all the remaining questions have been asked in Set I.

Q. 4. Why is the equilibrium constant K related to only $E0_{cell}\ and\ not\ E_{cell}$? **1**

Q. 6. Write IUPAC name of the complex $[Cr(H_2O)_5\ CI]CI_2$. **1**

Q. 7. How is ammonia molecule a good ligand? **1**

Q. 8. Complete the nuclear equation: **1**
$^{96}_{42}Mo + ^{2}_{1}H \rightarrow ^{97}_{43}Te + ...$

Q. 15. A piece of wood was found to have $^{14}C/^{12}C$ ratio 0.7 times then that in the living plant. Calculate the period when the piece of wood separated from the living plant. **2**
[$t_{1/2}$ for ^{14}C = 5760 years]

Q. 21. Using the valence bond approach, predict the shape and magnetic character of **2**
$[Fe\ (CN)_6]^{3-} - ion.\ [At.\ no.\ of\ = 26]$

Q. 22. Write one chemical reaction each to exemplify the following:
(i) Cannizzaro reaction
(ii) Williamson's synthesis **2**

Q. 25. Account for the following:
(a) Zirconium and Hafnium exhibit almost similar properties.
(b) Zinc salts are white while Cu^{2+} salts are coloured. [At. nos. Zn = 30, Cu = 29] **2**

Q. 29. How is the third law of thermodynamics useful in calculation of the absolute entropies? Calculate the value of ΔS^0 for the following reaction at 400 K:

$2NOCl\ (g) \rightarrow 2\ NO\ (g) + Cl_2\ (g)$

If the value of equilibrium constant for the reaction at 400 K is 1.958 x 10^{-4} and $\Delta H^0 = 77.2\ kj\ mol^{-1}$.[$R = 8.314\ J\ K^{-1}\ mol^{-1}$

Q. 30. Write chemical tests to distinguish between: **3**

(i) Acetaldehyde and Acetone

(ii) Acetic acid and Acetaldehyde

(iii) Phenol and Propanoic acid

Q. 31. Calculate the cell emf at 25° C for the following cell:

$Ni\ (s) \mid Ni^{2+}(0.01M) \parallel Cu^{2+}(0.1M) \mid Cu\ (s)$

[$Given\ E^0_{M^{2+}/Ni} = -0.25\ V,\ E^0_{Cu^{2+}/Cu} = +0.34\ V, 1\ F = 96{,}500\ C\ mol^{-1}$]

Calculate the maximum work that can be accomplished by the operation of this cell. **3**