ANSWER KEY

MCQs:

1-B

2-a

3-A

4-B

5-B

6-D

7-C

8-D

9-B

10-B

11-C

12-A

Assertion-Reason:

13-a

14-C

15-A

16-a

17. Molar conductivity = 124 S cm2 mol−1

18. EMF = 0.34 – (–0.76) – 0.0591/2 log (0.1/1) ≈ 1.15 V

19. fuel cells are the devices which covert the energy produced during combustion of fuels like H2, CH4,etc. directly into electrical energy. The electrde reaction for H2-O2 fuel cell

And correct reactions:

20. Hexacyanoferrate(II); d^2sp^3 hybridization

21.any two methods of preparation

22. $i = 1 + \alpha(n-1) \rightarrow \alpha = 0.75$

23. $\Delta G^\circ = -nFE^\circ = -2 \times 96500 \times 0.78 \approx -150.54$ kJ

24. $k_2/k_1 \approx e[(Ea/R)(1/T_1 - 1/T_2)] \approx 2.0$

25. a). the catalytic activities of transition metals is attributed to the follwing reasons

I) because of their variable oxidation state ,transition metals form unstable intermediate compounds and provides a new path with the lower activation energy for the reaction.

II) In some cases the transition metals provides a sutaible large surface area with free valancies on which reactants are absorbed

B) orbitals of sutaible energy,the small size of cations ,and higher nuclear charge

C) due to the presence of unpaired electrons in d-orbitals which undergoes a d-d transition

26. $[CoCl_2(en)_2]^+ \rightarrow$ dichlorobis(ethylenediamine)cobalt(III); shows optical isomerism

27. SN1 involves carbocation intermediate, e.g. t-butyl chloride

28. Given conversions

29.I). correct answer

Ii) correct answer

Iii)correct answer

30. Use Nernst equation → E ≈ 2.8 V

31.For second order reaction Let [A] = a then Rate = Ka/2

(i) If [A] = 2a then Rate = K (2a)2 = 4 Ka/2

∴Rate of reaction becomes 4 times

(ii) If [A] = a/2 then Rate = K (a/2)2=Ka2/4

∴ Rate of reaction will be 1/4 th .

32. Preparation of $K_2Cr_2O_7$ from chromite ore; properties include oxidizing nature and uses

Preparation of KMnO4 from pyrolucite ore; properties include oxidizing nature and uses

33.I. correct answer

Ii. correct answer

Iii. correct answer