S Y B Sc
SEM IV
Chemistry paper -1
Sample Questions
Exam Mission 2020

PHYSICAL CHEMISTRY

1. Electrochemistry

1. Quinhydrone electrode gives good result at pH range ----------
   a) 1-8
   b) 1-9
   c) 1-7
   d) 1-10
2. Quinhydrone electrode does not work properly if sample contains----------
   a) Proteins & Amines
   b) Carbohydrates
   C) .Fats
   d) starch

3.) In pH determination with quinhydrone electrode in alkaline media is given by formula _____

   a) pH= Ecell + 0.457/ 0.0592
   b) pH= Ecell - 0.457/ 0.0592
   C) Ecell= pH + 0.457/ 0.0592
   d) Ecell= pH - 0.457/ 0.0592

4) M(Hg) /Mn+ is an example of ---------- type of electrode.

   a) Metal –metal ion electrode
   b) Metal Amalgam electrode
   a) Redox electrode

5) Pt /Mn+(aq) ,Mn+ is an example of ---------- type of electrode.

   a) Metal –metal ion electrode
   b) Metal Amalgam electrode
   b) Redox electrode

6) Two main classes of concentration cells are -1) Electrode Cells 2)----------
   a) Electrolytic cells
   b) Chemical cells
   c) Galvanic cells

7) If cell is represented as –
   Cd/ Cd+2 // Ag +/Ag If $E^0_{Ag+/Ag} = 0.799$ $E^0_{Cd+2/Cd} = 0.403$
   a) 1.202
   b) 1.203
   c) 1.204

8) Calculate the Potential of the electrode, Ag/AgCl(a) , Cl^- (a= 0.01)
   a) 0.3407 V
   b) 0.3402V
   c) 0.3400V
   d) 0.3300V

9) Gibb's phase rule is given by –

a) F= P-C +2
b) F= C-P +2
c) F= C+P -2
d) F= C+P

10) The In condensed Phase rule **F=C-P +1,** The term F is called as----------

a) Phase
b) Degree of freedom
c) Component
d) constituents

11) In Claperyon equation $\frac{dp}{dT} = \frac{\Delta H(or\ L)}{T(VB-VA}$ the term Δ H is ------

a) Molar enthalpy change
b) Molar entropy change
c) Molar Volume
d) Molar Gibb's free energy

12) The no of components in system CaO (s) ---------.>CaO(s) + Co (g) is ---------

a) 1
b) 2
c) 3
d) 4

13) The no of components in system CaO (s) ---------.>CaO(s) + Co (g) is ---------

a) **1**
b) 2
c) 3
d) 4

14) The degree of freedomof system NaCl (solid) → NaCl(soln) → H_2O (vapour) is-

a**) 1**
b) 2
c) 3
d) 4

15) In phase diagram of sulphur system there are ------ areas& 6 Curves and 4triple poin

a) **4**
b) 5
c) 6
d) 7

16) Zinc melts at 420 ^{o} and Magnesium at 600^{0} and their compound melts at temperature ----------degrees

a) **590**
b) 591
c) 592
d) 593

17) A solution containing completely dissolved solid is considered to be------- phase.

a) Single

b) Double

c) Triple

d) Multiple

18) ---------- is defined physically distinct and mechanical inseparable part of system.

a) Phase

b) Component

c) degree of freedom

d) none

INORGANIC CHEMISTRY (Unit II)

Chapter: 2.1 Comparative chemistry of transition Metals

2.2 Coordination chemistry

19 Valence shell electronic configuration of Fe is _____

a) $3d^6,4s^2$

b) $3d^5,4s^2$

c) $3d^7,4s^2$

20 _____ is stable oxidation state for Titanium

a) +2

b) +4

c) +6

d) Zero

21 Patronite is important ore of _____

a) Scandium

b) Titanium

c) Vanadium

d) Chromium

22 Spin only magnetic moment value of $Cr^{+3}$is _____ B.M.

a) 1.73

b) 2.83

c) 3.87

d) 4.90

23 Transition metal ions with _____ electronic configuration are coloured.

a) d^3

b) d^0

c) d^{10}

d) None of these

24 $[Cu (NH_3)_4] SO_4$ is an example of _____

a) anionic complex

b) Cationic complex

c) neutral compound

d) organic compound

25 Denticity of Ethylene diamine tetra acetic acid is _____

a) Zero

b) One

c) two

d) Six

26 _____ is an example of polydentate ligand

a) EDTA
b) H_2O
c) NH_3
d) Cl^-

27 Name of $[Co(NH_3)_6]Cl_3$ complex _____

a) Hexammine cobalt (III) chloride
b) Trichloro hexammine cobaltate (III)
c) Hexamine trichloro cobalt(III)
d) Trichloro cobaltate (III) hexamine

28 $[CoCl(H_2O)(en)_2]Cl_2$ and $[Co Cl_2 (en)_2] Cl. H_2O$ are_____ isomers of each other

a) ionization
b) coordination
c) optical
d) hydrated

29 Primary valency of Cu in $[Cu(NH_3)_4]SO_4$ complex is _____

a) 2
b) 3
c) 0
d) 4

30 The oxidation state of metal ion in $[Mn(CN)_6]^{4-}$ is _____.

a) Zero
b) +2
c) +3
d) +4

31 Ni^{2+} forms scarlet red precipitate with _____ in presence of ammonia.

a) Dimethylglyoxime
b) ethylenediamine
c) EDTA
d) diethylene triamine

32 The Coordination number of metal ion in $[Cu(NH_3)_4]SO_4$ is _____

a) 6
b) 2
c) 3
d) 4

33 Among the following, which compounds follow the EAN rule - .

A) $K_4[Fe(CN)_6]$ B) $[Fe(H_2O)_6]^{2+}$ C) $[Ni(CO)_4]$

a) A and B
b) A and C
c) B and C
d) all A,B and C

34 $[Ni(CO)_4]$ complex shows _____ hybridization

a) sp^2
b) dsp^2
c) sp^3
d) sp

35 _____ is an example of low spin complex

a) $[Ni(CN)_4]^{2-}$
b) $[CoF_6]^{3-}$
c) $[Fe(H_2O)_6]^{3+}$
d) $[CoF_6]^{3-}$

36 Which of the following shows paramagnetic property?

a) $[Ni(CN)_4]^{2-}$
b) $[NiCl_4]^{2-}$
c) $[Ni(CO)_4]$
d) Cr(CO)6

37 Haemoglobin in the red blood cells contains _____ prophyrin complex

a) Fe
b) Mg
c) Cu
d) Co

38 When a molecule of $[Co(NH_3)_6]Cl_3$ is dissolved in water, the number of ions formed are _____

a) 1
b) 2
c) 3
d) 4

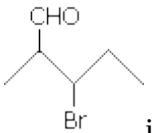
Organic Chemistry Carboxylic acid & sulphonic acid

39. Common name of o- Hydroxy benzoic acid is……..

a. Cinnamic acid
b. Crotonic acid
c. 2- hydroxy -1- benzoic acid
d. Salicylic acid

40. The benzyl alcohol can be directly oxidised into a….. by using $KMnO_4$

a. Cinnamic acid
b. Benzoic acid
c. Benzaldehyde
d. Salicylic acid

41. The IUPAC name of 

is _____

a. 2- methyl-3-bromohexanal
b. 2- methyl-3-bromobutanal
c. 3- bromo-2-butanal
d. 3-bromo-2-methylpentanal

42. Carboxylic acid is prepared from Toluene by action of….

a. Dry ether
b. Dry ice
c. Air Oxidation
d. Alcohol

43. Formation of α- halogen acid from carboxylic acid is called…..
    a. Dieckmann Condensation
    b. HVZ reaction
    c. Claisen condensation
    d. Hell-Volhard-Zelinskii reaction

45. Benzene is heated with sulphuric acid gives…….
    a. Nitrobenzene
    b. Benzene sulphonic acid
    c. Cyclohexane
    d. Cyclohexyl sulphonic acid

46. acetic acid is a weaker acid than 2-chloro acetic acid due to ……effect.
    a. Electron withdrawing inductive effect (-I effect)
    b. Electron withdrawing inductive effect (+I effect)
    c. Electron donating inductive effect (-I effect)
    d. Electron donating inductive effect (+I effect)

47…….. is prepared from phenol by Nitration reaction
    a. benzene
    b. Phenol
    c. Nitrobenzene
    d. Picric acid

48. Strength of trichloroacetic acid (A), trifluoroacetic acid(B) strength of acetic acid (C) and Formic acid(D) is……
    a. A > B > C > D
    b. A > C > B > D
    c. B > A > D > C
    d. B > D > C > A

49. …….. reagent used to distinguished Benzaldehyde and acetone .
    a. Hydrazine
    b. Tollens reagent
    c. Sodium hydroxide solution 2,4-DNP
    d. In the following sequence of reactions, the alkene affords the compound 'B'

50. Which of the following is not correct correct?
    a. Any aldehyde gives secondary alcohol on reduction
    b. Reaction of vegetable oil with H_2SO_4 gives glycerin
    c. C_2H_5OH, iodine with NaOH gives iodoform
    d. Sucrose on reaction with NaCl give invert sugar