Chemistry Exam (A)

1) The role of coke in a blast furnace is similar to that of natural gas in a Midrex furnace. Which of the following explains this statement?

a) Both of them are used as catalysts to reduce time consumed in reduction process.

b) Both of them are used to prepare the reducing agent.

c) Both of them are used as a reducing agent.

d) Both of them are used as fuel to operate the furnaces at high temperatures.

2) Calculate the degree of dissociation for a weak monoprotic acid with concentration 0.01 M and pH=5

a) 0.05 b) 0.001 c) 0.01 d) 0.005

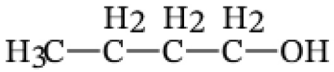
3) If 3 Faradays are required to deposit 1 mole of metal (X^{+x}). What is the chemical formula of metal oxide?

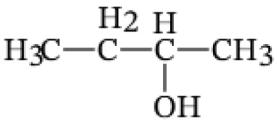
a) XO_2 b) XO c) X_2O_3 d) No suitable answer

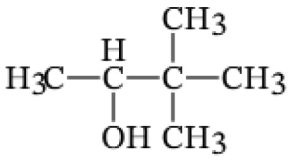
4) Dilute Hydrochloric acid added to a solution containing equal concentrations of Fe^{2+}, Ca^{2+}, Pb^{2+}, and Cu^{2+}.Which one of these cations would precipitate.

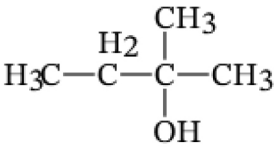
a) Cu^{2+} b) Fe^{2+} c) Pb^{2+} d) Ca^{2+}

5) Which of the following considered a tertiary monohydric alcohol.

a) 

b) 

c) 

d) 

6) Which of the following happens upon closing the Galvanic cell circuit.

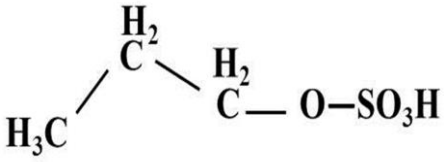
a) Anions move toward the Anode through the porous septum

b) Cations move toward the Anode through the porous septum

c) Electrons move through the external wire from the + rode toward the r –ve rod

d) Electrons move through the external wire from the cathode toward the anode

7) What is the product of thermal cracking for the following compound:



a) C_2H_4 b) C_3H_8

c) C_3H_7 d) C_3H_6

8) Study the following table:

Acid	HU	HW	HY	HX
Ionization degree	2.8%	5.9%	13.4%	9.2%

Which acid has the highest conductivity…….

a) HU b) HW c) HY d) HX

9) Which analytical group can be precipitated* by *acidic Hydrogen sulphide.

a) The third analytical group

b) The second analytical group

c) The fifth analytical group

d) The first analytical group

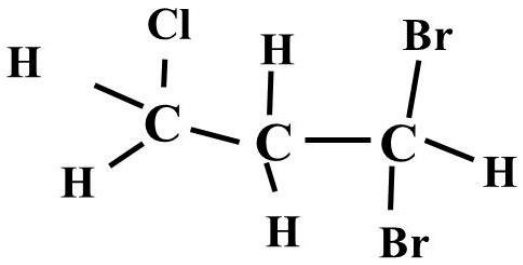
10) What is the IUPAC name of the following formula of a halogenated alkane……

a) 3,3-Bromo-1-Chloropropane

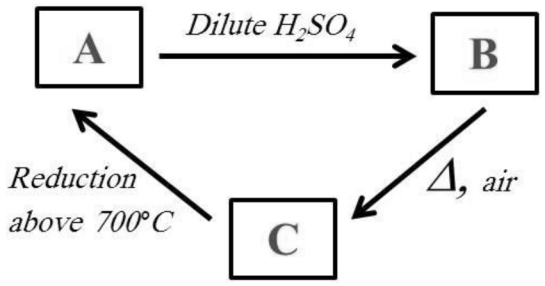
b) 1,1-Dibromo-3-chloropropane

c) 1,1-Bromo-3-chloropropane

d) 3,3-Dibromo-1-chloropropane



11) Study the following diagram , then Find out A, B and C



a) A: Fe , B: $FeSO_4$, C: Fe_2O_3

b) A: Fe , B: $Fe_2(SO_4)_3$, C: Fe_2O_3

c) A: $FeCl_3$, B: $FeSO_4$, C: Fe_2O_3

d) A: Fe_2O_3 , B: $FeSO_4$, C:Fe

12) Dilute Hydrochloric acid could be used to distinguish between……..

a) Na_2CO_3 and $NaHCO_3$ b) Na_2SO_4 and NaCl

c) Na_2SO_3 and NaCl d) Na_3PO_4 and NaI

13) During the reversible reaction, Which of the following represents the graph relating concentration and time ?

a) The concentration of reactant decreases until it completely consumed.

b) The concentration of product increases and concentration of reactant decreases until they reach a constant concentration.

c) The concentration of both reactants & products increase until they reach equilibrium.

d) There is no change in the concentration of both reactants & products since the beginning of the reaction.

14) How many hours for a current of 5 Ampere strength is needed to precipitate 6.35 g of Copper from Copper sulphate solution, the cathode reaction is:

$$Cu^{+2}_{(aq)} + 2e \rightarrow Cu^{\circ}_{(s)} \quad (Cu = 63.5g).$$

a) 0.5 h b) 1.07 h c) 1.5 h d) 2.3 h

15) The standard electrode potential, E, is measured under standard conditions. Which of the following is not a standard condition when measuring these values.

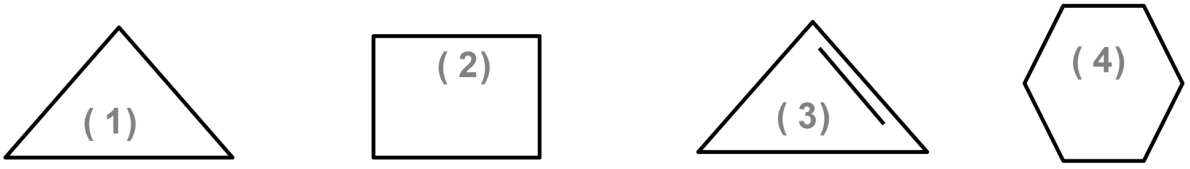
a) Temperature of 298 K (25 C)

b) Concentration of solution is 1 M

c) KNO_3 solution in the salt bridge

d) Measuring against standard Hydrogen electrode

16) These are four cyclic aliphatic hydrocarbons:



The correct arrange of stability of these compounds: (From less stable to more stable)

a) (2) , (1) , (3) , (4).

b) (3) , (1) , (4) , (2)

c) (1) , (3) , (2) , (4)

d) (3) , (1) , (2) , (4)

17) Calculate the solubility product (K_{sp}) of $Al(OH)_3$ giving that its degree of solubility equals 10^{-6} mole/liter.

a) 2.7×10^{-23}

b) 5.9×10^{-11}

c) 13.5×10^{-10}

d) 8.5×10^{-8}

18) Which of the following has the largest number of paired electrons.

a) $_{29}Cu^{2+}$

b) $_{23}V^{5+}$

c) $_{29}Cu^{1+}$

d) $_{24}Cr^{2+}$

19) Dry distillation of Sodium Propanoate forms…….

a) C_3H_8

b) C_2H_6

c) C_4H_{10}

d) C_3H_6

20) Consider the following observation of the qualitative analysis of two samples, A and B, of unknown sodium salts.

Test	Sample A	Sample B
Addition of dilute $HCl(aq)$ to salt solid	No gas evolved	No gas evolved
Addition of concentrated $H_2SO_4(aq)$ to salt solid	No gas evolved	No gas evolved
Addition of $BaCl_2(aq)$ to salt solution	White precipitate insoluble in dilute HCl	White precipitate soluble in dilute HCl

It can be concluded that sample (A) is …….. and sample (B) is ……

a) Na_2S and Na_2SO_3 b) Na_3PO_4 and Na_2SO_4

c) Na_2SO_4 and Na_3PO_4 d) $Na_2S_2O_3$ and Na_2SO_3

21) Organic compound obtained from dropping water on Calcium carbide then catalytic hydration of the produced gas:

a) Ethanol. b) Ethanal c) Acetaldehyde d) Both (b) , (c)

22) Steel, is a solid mixture consisting of Carbon atoms get into the holes of an Iron atom structure, is an example of

a) An Intermetallic alloy b) Brass alloy

c) A substitutional alloy d) an interstitial alloy

23) Which of the following is correct about the solution obtained by mixing 10 ml of 0.2 M KOH with 20 ml of H_2PO_4 0.1 molar,

a) The obtained solution will be acidic and turns methyl orange yellow.

b) The obtained solution will be alkaline and turns methyl orange yellow.

c) The concentration of the obtained solution will be 4 M.

d) The obtained solution will be acidic and turns Bromothymol blue yellow.

24) Considered the following equilibrium system

$$Br_{2(aq)} + H_2O_{(l)} \leftrightarrow Br^-_{(aq)} + 2H^+_{(aq)} + OBr^-_{(aq)}$$

The aqueous Bromine is characterized by a yellowish-brown colour but the Br^- and OBr^- are colourless. Thus it is expected that the colour of Bromine will be fade upon the addition of ……

(a) H_2SO_4 (b) KOBr (c) $AgNO_3$ (d) KBr

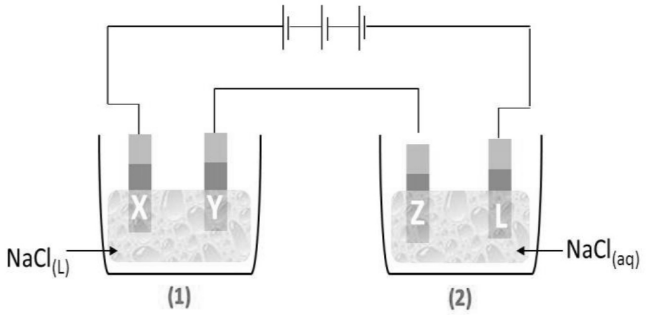
25) Which indicator is not used to differentiate between distilled water and acetic acid solution.

a) Litmus b) Phenol Phethalein c) Methyl orange d) Bromothymol blue

26) <u>In the opposite diagram</u>:

Cell (1) contains molten Sodium chloride

Cell (2) contains aqueous solution of Sodium chloride



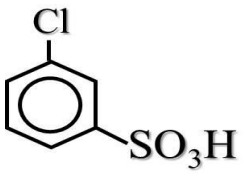
An electrolysis process is made for both of them, the substances formed at the electrodes (X, Y, Z, and L) are ……

	X	Y	Z	L
a	Cl_2	Na	Cl_2	H_2
b	H_2	Cl_2	Na	Cl_2
c	Cl_2	Na	Na	Cl_2
d	Cl_2	Na	Na	O_2

27) Which of the following occurs upon the addition of 3 moles of Bromine dissolved in CCl_4 to one mole of 2-Butene.

a) The intensity of red colour of Bromine decreased
b) The red colour of Bromine water discharged.
c) The red colour changed into green.
d) The intensity of red colour remains unchanged.

28) Which of the following choices suitable to prepare the following compound:



a) Chlorination of benzene then Sulphonation

b) Sulphonation of Chlorobenzene

c) Chlorination of benzene sulphonic acid

d) No suitable answer

29) Calculate the Pressure of Nitrogen for the following equilibrium:

$$N_{2(g)} + 3H_{2(g)} \leftrightarrow 2NH_{3(g)} \quad [K_p=25x10^{-5}]$$

Giving: pressure of Hydrogen and Ammonia are 6.8 and 0.4 atm.

a) 10 atm b) 20 atm c) 30 atm d) 40 atm

30) Which of the following pairs used to detect Lead acetate …….

a) S^{2-} and PO_4^{-3} b) Fe^{2+} and SO_4^{-2}

c) S^{2-} and SO_4^{-2} d) NO_2^{1-} and Cl^{-1}

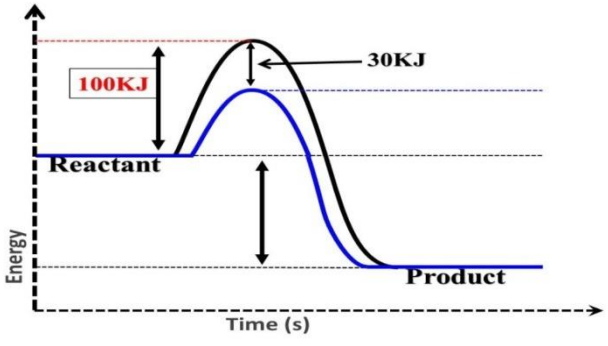
31) In which of the following compounds the oxidation number of Iron not changed when heated in air:

a) Iron II oxalate b) Iron II sulphate

c) Siderite. d) Limonite

32) Study the figure below that show the activation energy before and after using Transition element as catalyst, what's the value of activation energy after using catalyst.

a) 130 kJ b) 30 KJ c) 50 kJ d) 70 kJ



33) The chemical equilibrium in ……. ….. reactions is a ……..… system that takes place when rate of forward equals the rate of backward

a) Irreversible , static

b) Reversible , static

c) Irreversible , dynamic

d) Reversible , dynamic

34) Which one of the following is <u>not</u> a purpose of the salt bridge.

a) Keep the liquid levels the same

b) Neutralizes excess of ions in both half cells

c) Keep the solutions separated

d) Complete the circuit

35) A Magnesium halide salt has the formula MgX_2. A 0.415 g sample of MgX_2 was dissolved in 100 ml of pure water, followed by the addition of excess NaOH. The precipitate of $Mg(OH)_2$ was filtered, washed, and dried. The precipitate was found to have a mass of 0.131 g. What is the identity of X.

[Mg=24 g/mol, O=16g/mol, H=1g/mol, F=19g/mol, Br=80g/mol, Cl=35.5g/mol, I=127g/mol]

a) Al

b) Br

c) Cl

d) F

36) Which of the following compounds used as a cleaner of electronic sets.

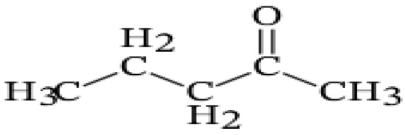
a) $CHBrClCF_3$

b) C_2H_4

c) CF_2Cl_2

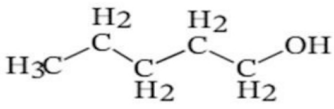
d) CH_4

37) The following product produces from the oxidation of an alcohol:

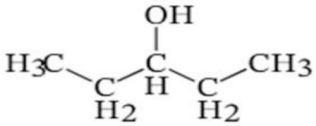


Which of the following alcohols could be the reactant.

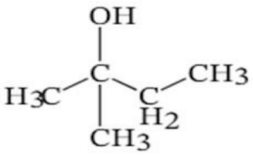
A



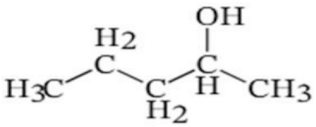
C



B



D



38) The following table represents the standard reduction potential of four elements A,B,C and D. The galvanic cell produces the highest e.m.f is …….

Element	*A*	*B*	*C*	*D*
Standard reduction potential (Volt)	*- 2.711*	*-0.28*	*+1.2*	*+2.87*

a) (B) as an anode , (D) as a cathode b) (D) as an anode , (A) as a cathode

c) (A) as an anode , (D) as a cathode d) (D) as an anode , (C) as a cathode

39) Which of these reactions leads to producing Hydrogen gas with faster rate:

a) Zinc powder with (2M) HCl. b) Zinc strip with (2M) HCl.

c) Zinc powder with (1M) HCl. d) Zinc strip with (1M) HCl.

40) Which of the following statements compare between two d-block elements is correct.

a) Titanium is denser than Nickel but has a smaller atomic radius.

b) Titanium is less dense than Nickel but has a larger atomic radius.

c) Titanium is denser than Nickel and has a larger atomic radius.

d) Titanium is less dense than Nickel and has a smaller atomic radius.

41) Which of the following is the preferred Iron ore for extraction in a blast furnace.

a) Siderite b) Magnetite c) Limonite d) Hematite

42) The number of alcoholic isomers of the molecular formula $C_4H_{10}O$ equals ……..

a) 2 isomers b) 3 isomers c) 4 isomers d) 5 isomers

43) From the properties of fuel cells…….

a) Consumed by time.

b) Supplied with external source of electricity.

c) Store electrical energy as chemical anode and cathode material.

d) Oxygen gas reduced at cathode of fuel cell.

44) Oils and fats could be hydrolyzed using…….. to produce glycerol and ……

a) NaOH, detergent

b) HCl, detergent

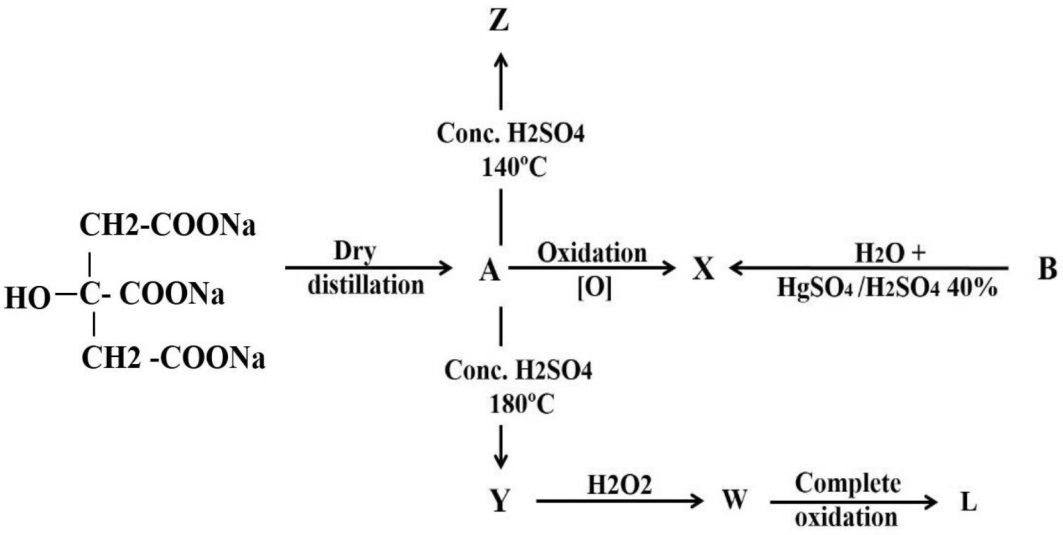
c) HCl, soap

d) NaOH, soap

45) Arrange the following compounds according to their magnetic moment:

$Fe_2(SO_4)_3$, $CuCl_2$, $ScCl_3$, $Ni_2(SO_4)_3$

46) Essay*:* Study the following diagram*:*



- ***Write the names of: X , B and A***
- ***Arrange A, W, L, Z according to boiling point.***