PAPER 2

CHEMISTRY

Form 4

Paper 2

MARKING SCHEME

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1.

a) Noble gases

b) K and W

c) Q, it has lowest nuclear charge hence electrons in the energy level are least pulled towards the nucleus

d) Q_3M_2 or Mg_3N_2

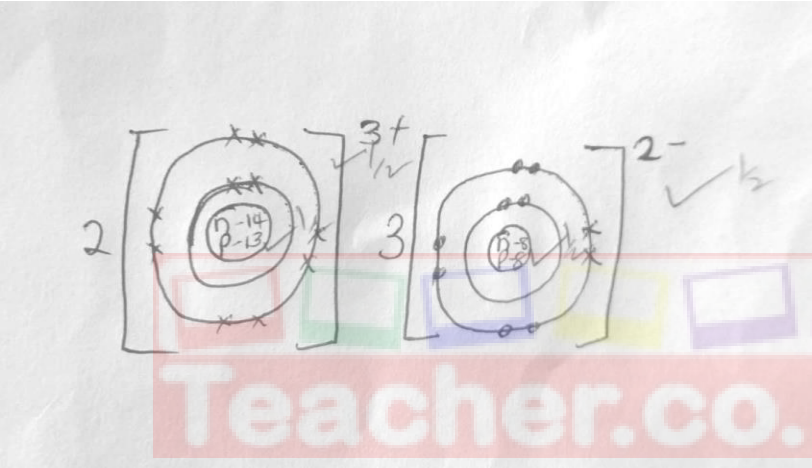
e)

i. Used for making sufuria /cooking pan
Property – good conductor of heat

ii. Used for making overhead cables

Property – not easily corroded / good conductor of electricity (**penalize electrical cables**)

f)



g) It has molecular structure with weak van der waals forces of attraction between the molecules which require little energy to break.

2.

a)

(i) Butanoic acid

(ii) 2,5 _ dibromo -4-methylpent-1,3-diene

(iii) Enthyl propanoate

b)

(i) P-soapy detergent
Q – soaplesss detergent

(ii) Q – does not form scum with hard water or it lathers easily

(iii) It is biodegradable

(iv) It is non-biodegradable hence pollutes the environment

c)

(i) Ethene

(ii) Ethanol and concentrated sulphuric (VI) acid

(iii)

3.

a)

i. Top pan balance
ii. Electronic balance
iii. Beam balance

b)

i. Due to incomplete combustion, it produces white hot carbon particles that emittes a lot of light
ii. It produces soot that makes apparatus dirty
iii. It does not produce much heat

c)

i. Nitrogen and oxygen
ii. It can be separated by physical means
Components of air are not chemically combined
iii. Pass air through lime water (Ca(OH)2) the lime water forms white precipitate indicating presence of carbon(IV)oxide

4.

a)

i. Frasch process
ii. A – hot compressed air
C – super heated water
iii. It has low boiling point
It is insoluble in water

b)

i. Sulphur (IV)oxide
ii. Catalytic chamber
iii. Concentrated sulphuric (VI)acid
iv. Water

c)

i. $H_2S_2O_{7(l)} + H_2O_{(l)} \longrightarrow H_2SO_{4(l)}$
ii. To remove impurities which may poison the catalyst

d)

i. Manufacture of fertilizer
ii. Manufacture of detergent
iii. Manufacture of dyes and paints
iv. Used in lead acid accumulators
(**any one correct**)

5.

a)

i. Zinc blende (penalize zinc sulphide)
ii. ZnO
iii. Reduction using carbon or carbon (II) oxide
iv. It is converted to zinc sulphate and electrolyzed

{b}

- ✓ Sulphur {IV} oxides/SO_2
- ✓ Carbon {IV} oxide /CO_2

{c}

- ✓ Sulphur {IV} oxide leads to formation of acid rain
- ✓ Carbon oxide causes global warming

{d}

- ✓ Zinc is used to galvanise iron to prevent it form rusting
- ✓ To make brass an alloy of copper and zinc {any one correct}

6. {a}

- ✓ Electrolysis is the chemical decomposition of an electrolyte using electrical energy

{b}

- ✓ Complete the circuit by making contact between the two solutions
- ✓ Maintains balance of charges in electrolytes by providing ions to replace those that are used up or those that are formed

{c} {i} M – it has the most negative E^{θ} value

{ii} M and N

{iii} $E\varphi = E\varphi$ R-h-s

$+0.52 - [-2.69]$

$=+3.21v$

{ii} Q = 1 t

$=0.25 \times 130 \times 60$

$=1950C$

{iii} 1950C ⟶ deposits 0.9g

⟵ 84g

$$\frac{84 \times 1950}{0.9}$$

$=182,000C$

1 F ⟶ 96,500C

⟵ 182,000C

$$\frac{182000 \times 1}{96500}$$

$1.88 = 2F$

Charges is 2+

7. [a]

- ✓ Add magnesium oxide to HNO_3/HCL/H_2SO_4 till in excess

- ✓ -Filter to obtain the filtrate
- ✓ -Add Na2CO3[any soluble carbonate] solution
- ✓ -Filter to obtain insoluble magnesium carbonate
- ✓ -Rinse and dry between filter papers
- ✓

{b}

{i} $NaHSO_4$ /$KHSO_4$

{ii} Solid A – $NaNO_2$/Sodium nitrate
Gas B – O_2/oxygen

{iii} Mixed with helium is used by mountain climbers and deep sea divers

- ✓ Air enriched with oxygen is used in hospitals by patients with breathing difficulties

{c}

- ✓ Availability
- ✓ Cost of fuel
- ✓ Heating value

{any two correct}