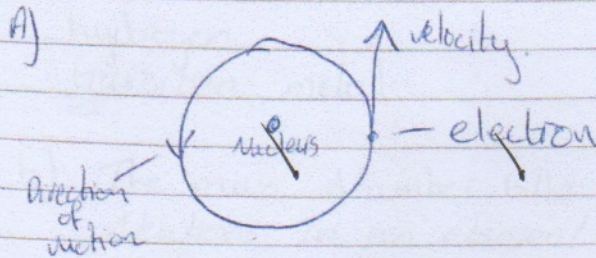


Scott Ling 1810357

Question 1



(2)

B) ① Negative electron moves around the positive Nucleus (proton) in circular motion. all electrons orbits are centered

② Allowed electron orbits ~~allow~~ allow the first quantization condition in angular momentum.

(2)

③ Electron is allowed to make transitions from one orbit to another ~~as~~ when an atom absorbs a photon, the electron will make a transition to a higher energy orbit

c) Lines in the emission or absorption ~~of~~ spectrum for hydrogen will arise as the energy is emitted or absorbed when an electron moves from one orbit to another.

(4)

Question 2

a) Alkali metal	Poor Metal	(1)
Alkaline earth metal	Non Metal	
hydrogen	Noble gases	
transition metal	Rare earth Metals	

b) The mass Number is the total number of Protons + Neutrons in an element.

The atomic Z number is the number of Protons found in the Nucleus.

(2)

c)

Nitrogen - 5

Oxygen - 6

Fluorine - 7

Neon - 8

(4)

d) Oxygen - 2
Nitrogen - 3, 5
Fluorine - 1
Neon - 0

(3)

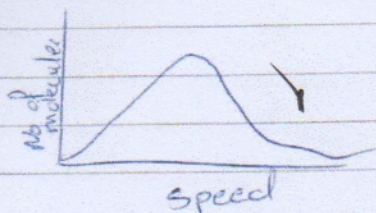
(10)

Question 3

a) The ability of an to store an explosive without any deterioration.

B) ~~The distribution of an amount of energy~~
the distribution of speeds for a gas at a certain temperature.
a Number of molecule at a specific velocity to temperature.

$$P = e^{-\frac{E}{KT}}$$



c) activation energy is the energy required for the reaction to proceed.

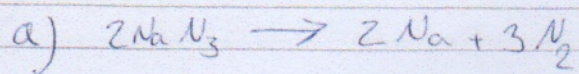
d)

Question 4

- a) This law states the enthalpy change on going from reactants to products is independent of the reaction path taken.



Question 5



(2)

B

Question 6

a) Cellulose Nitrate,

(1)

B) Boiling, pulping, peaching Screening drying
Nitration?

(1)

c)

d)

e) ~~Set~~ Low nitrogen is soluble in acetone and an ether-alcohol mix and used in intz ~~cont~~ to high nitrogen explosive is soluble in acetone but not an ether alcohol mix. Low nitrogen is not considered an explosive if Nitrogen is below 12.3% high Nitrogen nitrocellulose above 12.6% is considered explosive.

(1)

f) Single base - Nitrocellulose is the only explosive ingredient.
double base - Nitroglycerine and Nitrocellulose is
triple base - Contains Nitroglycerine, Nitrocellulose and Nitroguanidine.

single base - small arms and artillery (all platforms)
double base - Restricted to ammo for pistol and submachine guns due to erosive effect. ^x

triple base - Artillery weapons / large guns due to difficult ignition characteristics. ^x

(5)

Question 6)

- g) erosive effect of hot propellants x
contains Nitroglycerine.
highly flammable

Hazard : sensitiveness / vulnerability
unstable

8

7/a sensitivity - ~~what level of initiation~~
what level of degree an explosive
can be initiated by impact heat or friction.

7/b) military applications
is easily obtainable
used worldwide

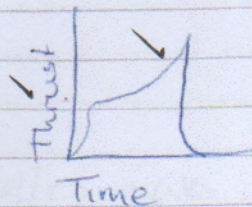
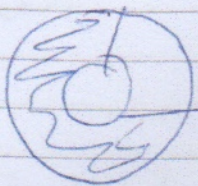
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Question 3

- a) ✓ chamber geometry
 ✓ chemistry of propellant
 ✓ geometry of propellant

(3)

b)



(3)

- c) vielle's law
 $R = \beta P^a$

(4)

- ✓ r = burning rate (mm s^{-1})
- ✓ β = burning rate coefficient (specific to a given Propellant)
- ✓ P = Pressure (MPa)
- ✓ a = Pressure Index

d)

Log Pressure	Log (Burn Rate)
1.397	1.857
1.698	2.143
1.875	2.313
2	2.436
2.096	2.528
2.176	2.606
2.243	2.671
2.30	2.727

(1)

(11)