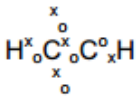
Q1.

2 **(a)** 

(1) **[1]**

(b) $n = \frac{PV}{RT} = \frac{(1515 \times 10^3) \times (76 \times 10^{-3})}{8.31 \times 298}$ **(1)**

$= 46.5$ **(1)** **[2]**

(c) **(i)** $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$ **(1)**

(ii) $n(C_2H_2) = n(CaC_2) = 100 \times 46.5$ **(1)**

mass of $CaC_2 = 100 \times 46.5 \times 64 =$

$= 297\ 570$ g

$= 297.6$ kg (accept 298 kg)

correct units necessary **(1)**

allow e.c.f. on candidate's answer in **(b)** **[3]**

Q2.

2 **(a)** there are no inter-molecular forces present between ideal gas molecules
ideal gas molecules have no volume
collisions between ideal gas molecules are perfectly elastic
ideal gas molecules behave as rigid spheres (any 2) [2]

(b) high temperature (1)
low pressure (1) [2]

(c) **most ideal** ..... neon..... nitrogen..... ammonia..... **least ideal** (1)
nitrogen has stronger van der Waals' forces than argon (1)
ammonia has hydrogen bonding as well as van der Waals' forces (1) [3]

(d) with increasing temperature,
average kinetic energy of molecules increases (1)
intermolecular forces are more easily broken (1) [2]

Q3.

(d) $n = \frac{PV}{RT} = \frac{6 \times 10^5 \times 710 \times 10^{-6}}{8.31 \times 293}$ (1)

$= 0.175$ (1) [2]

(e) $P = \frac{nRT}{V} = \frac{0.175 \times 8.31 \times 278}{710 \times 10^{-6}}$ (1)

$= 569410.5634$ Pa $= 5.7 \times 10^5$ (1)

allow ecf on **(d)** [2]

Q4.

(c) **(i)** for an ideal gas, **any four** from the following

the molecules behave as rigid spheres (1)

there are no/negligible intermolecular forces between the molecules (1)

collisions between the molecules are perfectly elastic (1)

the molecules have no/negligible volume (1)

the molecules move in random motion (1)

the molecules move in straight lines (1)

the kinetic energy of the molecules is directly proportional to the temperature (1)

the pressure exerted by the gas is due to the collisions between the gas molecules and the walls of the container (1)

not an ideal gas obeys $pV = nRT$

(max 4)

(ii) there are intermolecular forces between CO_2 molecules/ CO_2 molecules have volume (1) [5]