Carbon and its compounds

1. *a) – making of pencil*
- As a lubricant[1m]
b) Graphite has delocalized in its structure hence it conducts electricity. Carbon uses all the four valency electrons to form covalent bonds hence do not have delocalized elect conduct electricity [2m]

[Total 3m]

2. *a) Carbon (IV) oxide (CO_2) 1*
b) $2NaHCO_3(s) \longrightarrow Na_2CO_3(s) + H_2O(l) + CO_2(g)$ 1
c) – Paper manufacture 1
- Manufacture of glass.
- Softening of hard water.

3. *Magnesium has a higher affinity for combined oxygen that carbon./Mg is more reactive than carbon thus displaces it from its oxide.*

4 *a) Carbon (iv) Oxide*
b) Blue flame. Carbon (iv) oxide burns in air with a blue flame 1

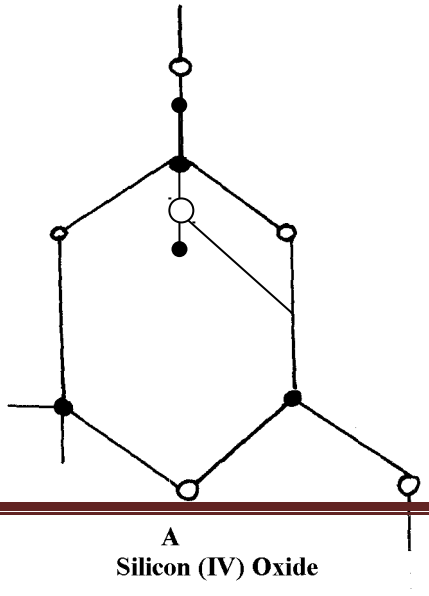
5. *a) A brown solid is formed*

b) $CuO_{(g)} + C_{(g)}$ _____ $Cu_{(g)} + CO_{(g)}$

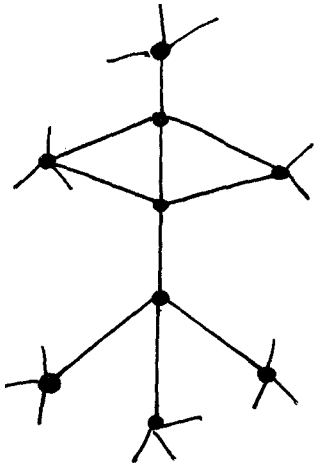
c) As a fuel in water gas

6. *(a) Covalent bond is bond between non-metal atoms where shared electrons are donated equally by all the atoms involved.*
Dative bond is a bond in which shared electrons are donated by one atom.
(b) The presence of triple bond in nitrogen requires very high temperatures to break ✓½

7. *(a) Reduction by using carbon*
b) J, carbon and H
decreasing order of reactivity 7. Study the structures **A** and **B**:



A
Silicon (IV) Oxide



B
Diamond

8. *(i) Have giant atomic structure* ✓1
(ii) To make drill bits or used in jewellery (any one)

9. *(a) Allotropy is the existence of an element √1 in more than one form without change of state.* ✓1
(b) Graphite contains delocalized √1 electrons between the layers while diamond has no free √1 electrons. Its atoms are strongly bonded. 3

10. *(a)* $C_{(s)} + CO_{2(g)} \longrightarrow 2CO_{(g)}$ *√1 (1 mk)*
(b) Burn charcoal in sufficient √1 oxygen Carbon (II) oxide (being a reducing agent) is easily oxidized to carbon (IV) oxide.√1 (1 mk) 3