| Question | Answer | Extra information | Marks | AO /  Spec. ref. |
| --- | --- | --- | --- | --- |
| **01** | A – salt water  B – steam  C – distilled water  D – iced water |  | 1  1  1  1 | AO3  C10.1.2 |
| **02.1** | 2400 (%) | accept 2350–3200 | 1 | AO3  C10.1.2  MS1c |
| **02.2** | 30 | accept 20–40 | 1 | AO3  C10.1.2  MS4a |
| **02.3** | Idea ofincreased demand. | Accept more cars/transport/uses for chemicals/polymers. | 1 | AO2  C10.1.2 |
| **02.4** | Idea ofeasily accessible oil already discovered/used up. | Accept most oil discovered/used up. | 1 | AO2  C10.1.2 |
| **02.5** | Any **two** from uncertainties about:   * future demand for oil products * amount of oil remaining * success of replacement by renewable energy. |  | 2 | AO2  C10.1.1 |
| **03.1** | 13 (%) |  | 1 | AO1  C10.2.1  MS1c |
| **03.2** | Description:   * useful materials recycled * unrecyclable parts to landfill   Explanation:  Any **two** from ideas that recycling:   * conserves raw materials * reduces energy use * reduces landfill * reduces pollution. | Allow copper/iron/glass/ plastic recycled;  allow some parts cannot be/are difficult to recycle. | 1  1  2 | AO1×1  AO2×3  C10.2.2 |
| **04.1** | Idea ofmanufacturing and packaging;  idea ofuse/maintenance/and operation during lifetime. | Allow distribution;  either order. | 1  1 | AO1  C10.1.1 |

| Question | Answer | Extra information | Marks | AO /  Spec. ref. |
| --- | --- | --- | --- | --- |
| **04.2** | **Level 3 (5–6 marks):** Reasonably detailed comparison of extraction/processing **and** disposal. | | 6 | AO1×4  AO2×2  C10.2.1 |
| **Level 2 (3–4 marks):** Basic comparison of extraction/processing **and** disposal. | |
| **Level 1 (1–2 marks):** Basic comparison of extraction/processing **or** disposal. | |
| **Level 0 (0 marks):** No relevant content. | |
| **Indicative content:**  Extraction/processing poly(ethene):   * (crude oil) is finite * drilling/processing (oil)/distribution requires a lot of energy * processing (oil)/and sometimes distribution in oil tankers causes pollution.   Extraction/processing paper:   * (wood) is renewable * (wood) is more sustainable * risk of pollution in rivers at paper mills * land usage to grow trees is high/can’t be used for growing food crops.   Disposal of poly(ethene):   * non-biodegradable * visual pollution/pollutes sea/harming wildlife * could be recycled * could be burned * releases energy if burned * not carbon neutral * uses landfill space.   Disposal of paper:   * biodegradable * is recycled * (ignoring processing) carbon neutral.   This indicative content is not exhaustive, other creditworthy responses should be awarded marks as appropriate. | |
| **05.1** | Because large amounts of energy would be needed to extract the copper. | Accept because it is labour-intensive to extract copper from this land;  accept because copper would have to be extracted from a large area of land (or words to that effect). | 1 | AO2  C10.2.2 |
| **05.2** | Any **one** from:   * produces large amounts of solid waste * atmospheric pollution from carbon dioxide/sulfur dioxide * more lorries/traffic. |  | 1 | AO1  C10.2.2 |
| **05.3** | Iron is cheap/scrap iron has reached the end of its useful life. | Accept iron is much more abundant than copper. | 1 | AO2  C10.2.2 |
| **05.4** | Iron displaces copper from solutions of its salts. | Accept iron is more reactive than copper. | 1 | AO1  C10.2.2 |
| **05.5** | Any **two** from:   * less expensive (or less energy) to extract the small amounts of copper * plants will remove carbon dioxide from the atmosphere as they grow * less air pollution/sulfur dioxide released. | Acceptcan release energy when plants are burned that could be used usefully/does not scar the landscape like a tradition open cast mine. | 2 | AO2  C10.2.2 |
| **05.6** | Not continuous as it takes a long time for plants to grow/burning plants releases carbon dioxide/ contributes to climate change. | Accept supply not continuous as plants only harvested once / twice a year. | 1 | AO2  C10.1.4 |