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Sustainability Through Technology

M6X02212

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Q1) a) The three carbon offsetting mechanisms set by the Kyoto Protocol are as follows;

- Emissions Trading
- The Clean development mechanism
- Joint implementation

An example for Emissions Trading would be to trade emissions from one company to another if one company feels as though they will need a higher emissions cap compared to the other. The EU Emissions Trading System would be an example of this.

Next is the clean development mechanism, an example of this would be that emission credits may be given to companies when they do emission reduction projects, an example of this would be to conduct a reforestation project. Finally we have joint implementation, an example of this would be reducing or removing emission in return for emissions credits to be used elsewhere.

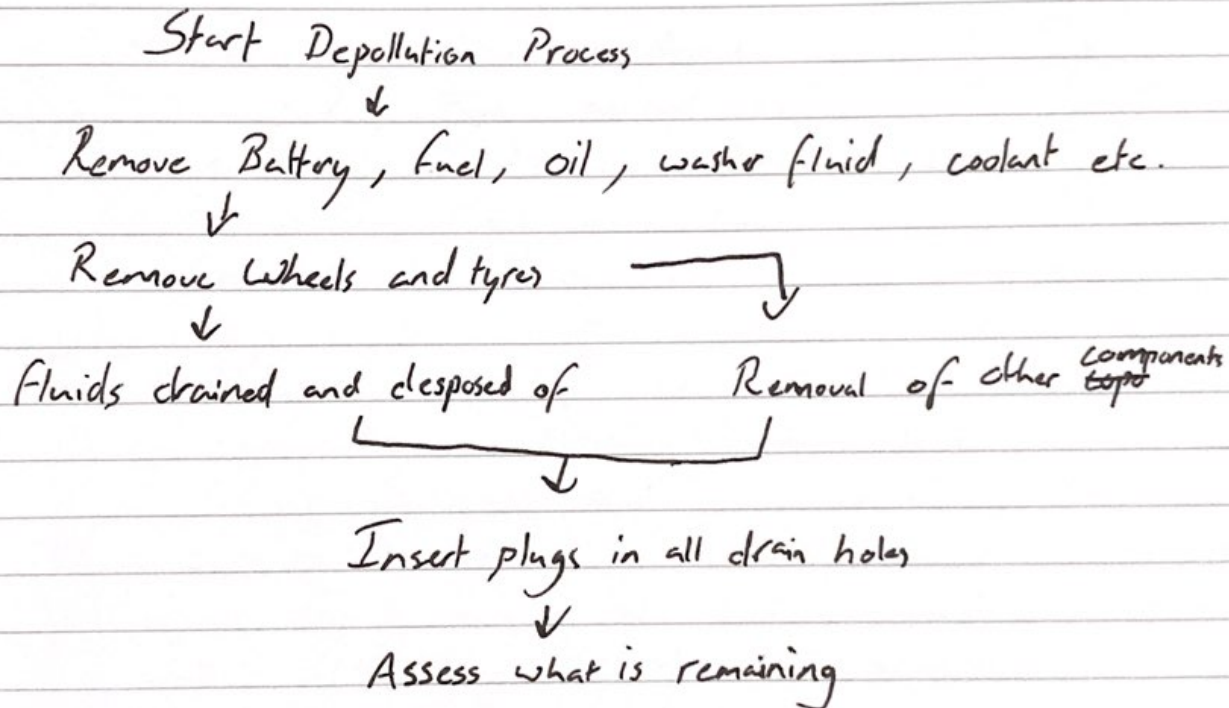
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Q2) a) The typical End of life process for an automotive vehicle are as follows.



This Process removes the polluting components prior to the vehicle being scrapped. Without this process the polluting components could cause further pollution as the fluids etc would end up in the ground and the fumes would go to the atmosphere.

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Q2) b) The five levels of autonomous driving are as follows;

- Level 1, driver assistance
- Level 2, Partial automation
- Level 3, Conditional automation
- Level 4, High automation
- Level 5, Full automation

Driver assistance allows for the functions such as adaptive cruise control and lane assist, these functions can be found on cars such as the VW T-Roc.

The effect of this level of automation on the automotive industry won't be that bad as most manufacturers are already implementing this level of automation.

Partial automation allows for functions such as the automation of steering and speed control, however with this level of automation the driver will still be required to have both hands on the steering wheel, this is to ensure that in the event of the system failing then the driver will still be in control.

Conditional automation allows for the vehicle to take full control and for the driver to sit back and relax whilst the car does all the work for them. However this system will only work when the road conditions are ideal. An issue that could arise from this level of automation may be that the system may not expect a change in the road condition and the driver may be sleeping, this may result in a crash.

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Q2) b) cont.

Level 4 automation allows for full control over the car in ideal conditions. The functions include steering, acceleration, turning and braking without driver input. This system also allows for the vehicle to be autonomous in traffic jams. An issue that may arise from this level of automation may be that the system may react to a situation faster than the car behind may be expecting, thus resulting in the possibility of injury to both drivers and any other occupants of the vehicle.

Level 5 automation means that the vehicle will not require any human input, this would allow for the driver to become more of a passenger as they won't be required to drive the car at all. An issue that may arise from this level may be that in the event of the system failing then the occupants of the vehicle may become stranded.