Answer for Q1

The sensors are

- Camera

  Advantages:
  - Cameras are relatively very cheap.
  - Vehicles are capable of maintaining a 360° view, thereby providing a broader picture of the traffic conditions around them.
  - With CVI, it is possible to detect all the surroundings with accuracy depending on the effectiveness of the code.
  - Using CVI, the cameras can easily identify other cars, pedestrians, cyclists, traffic signs and signals, road markings, bridges, and guardrails.
  - It is possible to gather 3D information about the environment if we use multiple cameras.

  Disadvantages:
  - Poor weather conditions such as rain, fog, or snow can prevent cameras from clearly seeing the obstacles.
  - We yet have not reached perfection in determining the stuff the camera sees which increases the likelihood of errors.

- Lidar

  Advantages:
  - The data gathered by Lidars is very accurate as it is an active sensor.
  - Used for 3D scans.
  - It is used to find distance between the sensor and the environment.

  Disadvantages:
  - They are crazy expensive.
  - Snow or fog can sometimes block lidar sensors and negatively affect their ability to detect objects in the road.

- Radar

  Advantages:
  - Radar works best at detecting objects made of metal.
  - It can accurately tell you the distance to a detected object.
  - Short range (24 GHz) radar applications enable blind spot monitoring.

    - Long range (77 GHz) radar sensors include automatic distance control and brake assistance.

  Disadvantages:

    - Its accuracy is less than Lidar.
    - widely-used 2D radars are not able to accurately determine an object's height, as the sensors only scan horizontally, which can cause a variety of problems when driving under bridges or road signs.

- Accelerometer
- Gyroscope
- GPS (or more accurately, GNSS)

  Advantages: GNSS is Global navigation satellite systems.
  It will help us in the situation when most of the cars on road will be autonomous.
  As we move towards the autonomous future, it will become essential for cars to communicate with each other.This totally eliminates the factor of two cars crashing with each other.

- Ultrasonic sensors