SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
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COIMBATORE-641 035, TAMIL NADU

DEPARTMENT OF AUTOMOBILE ENGINEERING

19AUE402 – Intelligent Vehicle Technology

Question Bank – Answers and reference materials

2 Marks

1. **List any four autonomous vehicles launched globally after 2019**

Ans:

a. Waymo One - Alphabet Inc. (Google's parent company)
b. Cruise Origin
c. Aptiv and Hyundai's Autonomous Vehicles
d. Zoox (Amazon)

2. **List any four autonomous vehicles technologies**

Ans:

a. Lidar (Light Detection and Ranging)
b. Radar (Radio Detection and Ranging)
c. Computer Vision
d. Sensor Fusion
e. Artificial Intelligence and Machine Learning
f. High-Definition Maps
g. V2X Communication (Vehicle-to-Everything)
h. Simulators

3. **Mention the role of Oxygen sensor in "Lambda Control"?**

Ans:

The oxygen sensor, specifically the lambda sensor or air-fuel ratio sensor, plays a crucial role in Lambda control. In general, the oxygen sensor in Lambda control acts as a feedback device that helps the engine control unit maintain the optimal air-fuel mixture for efficient and clean combustion. It plays a crucial role in modern vehicle emissions control systems and is essential for achieving better fuel economy and reduced environmental impact

4. **State "Doppler" effect**

Ans:

The Doppler effect is a phenomenon where the perceived frequency or wavelength of waves changes due to the relative motion between the source of the waves and the observer. This effect has significant applications in various fields, including astronomy, meteorology, and automotive safety.

5. What are the major components for "Air Induction System"?

Ans:

The major components of an air induction system typically include:

a. Air Filter
b. Mass Airflow Sensor (MAF)
c. Throttle Body
d. Intake Manifold
e. Intake Air Temperature (IAT) Sensor
f. Vacuum Lines and Hoses
g. Resonators and Silencers
h. PCV (Positive Crankcase Ventilation) System
i. Air Intake Ducts and Tubes
j. Air Cleaner Housing or Airbox
k. Turbochargers and Superchargers

6. What are the major components for "Fuel Delivery System" in vehicles?

Ans:

The major components of a typical fuel delivery system in vehicles include:

a. Fuel Tank
b. Fuel Pump
c. Mechanical / Electric Fuel Pump
d. Fuel Filter
e. Fuel Lines
f. Fuel Pressure Regulator
g. Fuel Injectors
h. Fuel Rail
i. Fuel Pressure Sensor
j. Fuel Tank Ventilation System
k. Fuel Pump Relay and Control Circuit
l. Fuel Pressure Damper (if equipped)
m. Fuel Filler Cap

7. What is the application of Catalytic Converter in vehicles?

Ans:

The application of a catalytic converter in vehicles is primarily focused on reducing the harmful emissions produced during the combustion process, making vehicles more environmentally friendly and compliant with emissions regulations while also contributing to better air quality and reduced health risks.

8. Write short notes on ABS

Ans:

ABS is a safety system in vehicles that prevents wheel lockup during braking, improving steering control, reducing stopping distances, and reducing the risk of accidents. It is an integral part of modern vehicle safety technology and has become a standard feature in many automobiles.

9. Write short notes on sensors and actuators

Ans:

Sensors are devices that sense and measure physical properties, providing input data to control systems, while actuators are devices that act on this data to produce physical motion or perform actions. Both sensors and actuators are essential components in various applications, including automotive, industrial automation, healthcare, and consumer electronics.

14 Marks

1. **Discuss about autonomous vehicles with suitable case study.**

Reference Link: https://onlineethics.org/cases/three-scenarios-self-driving-vehicles

Reference Link: https://www.123helpme.com/essay/Self-Driving-Cars-Case-Study-751565

2. **Discuss about the role of control in Autonomy in vehicles**

Reference Link: https://tinyurl.com/3rdtjfnm

3. **Discuss on Fuel control with appropriate illustrations**

Reference Link: https://tinyurl.com/bdd9eap5

Reference Link: https://tinyurl.com/ykbp5cav

4. **Discuss on Ignition control with appropriate illustrations**

Reference Link: https://themechanicalengineering.com/electronic-ignition-system/

5. **Elaborate on the working of Lambda control with relevant sketch**

Reference Link: https://www.elprocus.com/lambda-sensor-working-applications/

6. **Explain any two autonomous vehicle technologies**

Reference Link: https://www.techtarget.com/searchenterpriseai/definition/driverless-car

7. **Review the role of sensors and actuators used in vehicles with suitable case.**

Reference Link: https://tinyurl.com/bdfzs24d

Reference Link: https://www.linkedin.com/pulse/sensors-actuators-key-technology-intelligent-engine-control-tharad/