

NB: - Question No.1 is compulsory.
Solve **any three** questions from remaining.
Assume suitable data wherever necessary.

Q.1 Answer **any four** questions:

- a) An 8-bit D/A converter has $V_{ref}=5V$. What is the output voltage when $B_{in}=10110100$? Also find V_{LSB} . 05
- b) Explain term Sensor and Actuator with examples. 05
- c) Explain PID Control with reference to Automotive Electronics. 05
- d) Compare microprocessor and microcontroller. 05
- e) What do you understand by Onboard Diagnostic system? 05

- Q.2 a) What do you understand by term Electric Vehicle? Explain the main components of Electric vehicle in detail. 10
- b) Explain Hybrid Electric vehicle architecture in detail. 10

- Q.3 a) Explain in detail electronically controlled Automatic transmission system. 10
- b) Explain basic sensor arrangement in automobiles? Also explain Lambda sensor and Throttle position sensor in detail with neat sketch. 10

- Q.4 a) Explain different parameters to be controlled in SI and CI engine with reference to Automotive Electronics. 10
- b) Explain acceleration and full load enrichment. Also explain deceleration fuel cutoff with reference to Digital Engine control. 10

- Q.5 a) Explain engine exhaust gas components and engine cooling system with diagram. 10
- b) Explain in details any three actuators used in Automobiles with neat diagram. 10

Q.6 Write short notes on following with neat labeled diagrams :

- a) Interfacing with Sensors in Automobiles 05
- b) Different types of memories in microprocessor 05
- c) Different methods of Analog to Digital Convertor. 05
- d) Vehicle speed sensor 05
