

- N.B.:** 1. Question No: 1 is compulsory.
 2. Solve any three questions from remaining questions.
 3. Assume Suitable data where necessary.

- Q 1] (a) Explain different classes of Multiplexing Communication Protocol. 05M
 (b) Explain the features of PWM. 05M
 (c) Define system bus and explain its types. 05M
 (d) Explain working of Manifold Absolute Pressure (MAP) Sensor. 05M
- Q 2] (a) Explain the features of MC9S12XD family. 10M
 (b) What is embedded system? Discuss the classification of embedded system with one example each. 10M
- Q 3] (a) Explain modes of operation of MC9S12XD family. 10M
 (b) Enlist sensors used in automobiles? Explain any two with neat sketch, principle of operation and location. 10M
- Q 4] (a) Draw and explain the block diagram of SCL. 10M
 (b) What is ECU? Explain ECU algorithm, Engine maps and Lookup tables. 10M
- Q 5] (a) Explain the modes of operation of SPI. 10M
 (b) What do you mean by X-by Wire Technology? Explain Drive by wire, Brake by wire and Throttle by wire with suitable example each. 10M
- Q 6] Write short notes on:-
- (a) Code Warrior IDE 05M
 (b) Actuators used in automobiles. 05M
 (c) CAN 05M
 (d) I2C module 05M