

VIII Semester B.E. Examination
(Open Elective)
Automotive Electronics(18EECO403)

Duration: 3 hours**Max. Marks: 100**

Note: i) Answer any TWO full questions from UNIT-I, any TWO full questions from UNIT-II and any ONE full question from UNIT-III.
ii) Assume suitable data if necessary with justification

UNIT-I

- 1 a. Elaborate on different segments of automotive industry and also discuss about automotive supply chain. (08marks)
- b. Calculate the fuel quantity for a 4 cylinder fully warmed up engine and very cold engine running at 1000rpm if the MAF(Ma) is 0.004kg/sec. (06marks)
- c. Derive the expression for mass air flow using speed density method. (06marks)
- 2 a. With the case study of engine ECU, explain in detail V model cycle for ECU development. (08marks)
- b. Compare the types of transmission system. (06marks)
- c. Calculate the slip in percentage if the car is traveling at the speed of 80mph, with a wheel radius of 16 inches with 4500 rpm. (06marks)
- 3 a. The air fuel ratio, spark timing and EGR are varied such that it effects the performance of engine. Analyze these performance parameters on engine with a neat graph. (08marks)
- b. Discuss the configuration of hybrid electric vehicle. (06marks)
- c. Explain ignition map with neat sketch. (06marks)

UNIT-II

- 4 a. Identify the sensor used for measuring the engine speed and explain its operation with neat sketch. (08marks)
- b. With the block diagram discuss the flexray node communication. (06marks)
- c. Explain the operation of fuel injector actuator. (06marks)
- 5 a. With the case study of master window lifter controller discuss how the CAN communication happens, illustrate the same with neat diagram. (08marks)
- b. The sensor is employed in clposed loop ignition timing to prevent the desirable knock, identify and explain the operation of the sensor. (06marks)
- c. Explain the operation of EGR actuator. (06marks)
- 6 a. Discuss the addressing schemes used in MOST protocol and describe the frame format of MOST 25. (08marks)
- b. Identify the sensor used for measuring the throlttle anglr and explain its operation. (06marks)
- c. Highlighting the feature of LIN protocol, discuss its opeartion. (06marks)

UNIT-III

- 7 a. Propose a ADAS architecture and solution for
 - i) Traffic sign recognition system
 - ii) Driver status monitoring system. (10marks)
- b. What is ISO 26262 functional safety standard and why functional safety is mandotary for automotive? How functional sfety norms are met using ISO (10marks)

standards, explain with help of ASIL levels.

- 8 a. What is vehicular diagnostics? Explain on board and off diagnostics. Explain various safety norms and standards for automotive system. (10marks)
- b. Discuss the features and frame format of KWP 2000 diagnostic protocol. (10marks)