AU 701 - ENGINE AND VEHICLE MANAGEMENT SYSTEM
QUESTION BANK

PART A (2 marks)

UNIT I: FUNDAMENTALS OF AUTOMOTIVE ELECTRONICS

1. Define velocity estimation. (Nov/Dec 2012)
2. Figuratively represent fuzzy estimator. (Nov/Dec 2012)
3. How does a microcontroller differ from a microprocessor? (Nov/Dec 2011)
4. List out different actuators used in electronic engine management and mention where they are used. (Nov/Dec 2011)
5. Define open and closed loop control strategies.
6. Explain briefly about PID control
7. What is meant by Look up tables?
8. Explain briefly about Fuzzy logic and adaptive control.
9. List the Parameters to be controlled in SI and CI engines.
10. List the Parameters to be controlled for the overall vehicle.

UNIT II: SENSORS

1. Give a list of the various types of sensors used in the MPFI petrol engine. (Nov/Dec 2012)
2. What is lambda sensor? Write use of it in vehicles. (Nov/Dec 2011)
3. Define magnetostriction phenomenon. (Nov/Dec 2012)
4. List 4 variables sensed in engine control system. (Nov/Dec 2011)
5. Explain briefly the Hall Effect.
6. Explain briefly the principle of thermistor
7. Explain the piezo electric effect.
8. What is the need to know the throttle position?
9. How air mass flow is calculated?
10. Why crank shaft position and cam position is to be known?
11. Explain briefly about tire pressure sensor.
12. What is closed loop control using EGO sensor?
13. What is the necessity for measuring the crank, cam shaft positions and engine speed in S I engine management system?
14. What is the need for measuring steering torque and steering position?
15. How the tyre pressure and brake pressure are measure in automobiles control systems?
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UNIT III: SI ENGINE MANAGEMENT
1. Define open loop control for fuel ignition system. (Nov/Dec 2011)
2. List the SI engine fuel system components. (Nov/Dec 2012)
3. Write the differences between throttle body injection and MPFI system. (Nov/Dec 2012)
4. Plot conversion efficiency versus lambda of a 3 way catalytic converter.
5. List the various types of Bosch injection systems.
6. What is meant by Group injection technique?
7. List the various fuel system components.
8. List the various phases of electronic engine control.
9. Explain briefly about Fuel control maps.
10. List the advantages of Electronic ignition systems.
11. What do you meant by engine knock?
12. What is the need for cold start and warm up phases in fuel injection system?
13. What is ignition advance?
14. Why the ignition advance required in S I Engines?
15. What is knocking in S I Engine? What is the system we have for controlling the knock?

UNIT IV: CI ENGINE MANAGEMENT
1. What is meant by Electronically controlled Unit Injection system? (Nov/Dec 2011)
2. What is meant by Pilot injection? (Nov/Dec 2011)
3. What do you understand by post injection. (Nov/Dec 2012)
5. List Fuel injection system parameters affecting combustion
6. What are the emissions in CI engines?
7. What is meant by advanced post injection and retarded post injection?
8. List the components of the common rail fuel injection system.
9. What are the parts used in the C R D I?
10. Explain the Term E G R?
11. What is Rail Pressure Limiter?
12. What are the advantages of C I Engine management system?
13. What is a flow limiter and how it controls the flow?

UNIT V: VEHICLE MANAGEMENT SYSTEMS
2. Write a brief note on vehicle tracking system. (Nov/Dec 2012)
3. List the applications of vehicle tracking system. (Nov/Dec 2011)
4. What is the advantage of ABS system
5. What is meant by damping control?
6. What are the advantages of Electric power steering?
7. What is meant by Supplementary Restraint System?
8. List the types of crash sensor.
9. What do you meant by Cruise control?
10. List the various Vehicle security systems
11. What is meant by On board diagnostics?

PART B (16 marks)

UNIT I: FUNDAMENTALS OF AUTOMOTIVE ELECTRONICS

1. Explain the architecture of a microprocessor. (Nov/Dec 2011)
2. Discuss in detail the parameters of to be controlled in SI and CI engines. (Nov/Dec 2011&2012)
3. Explain about open loop and closed loop control in an automobile.
4. Explain PID controller in detail.
5. Explain about fuzzy logic and adaptive control technique.
6. What is meant by a look up table and how it is used in engine control?

UNIT II: SENSORS

1. Explain the EGO sensor construction and operation. (Nov/Dec 2011&2012)
2. Write short notes on a) Throttle angle sensor b) Air Flow sensor (Nov/Dec 2011)
3. Write short notes on a) EGO sensor b) knock sensor (Nov/Dec 2011)
4. Explain the construction and working of a sensor based on Hall Effect and its application in a car.
5. Explain the construction and working of a sensor based on piezo electric effect and its application in a car. (Nov/Dec 2011 & Nov/Dec 2012)
6. Explain the hot wire anemometer operation with neat sketches.
7. Explain the various types of crash sensors.
8. How engine and wheel speed sensor works.
9. How crank shaft position sensor works?
10. How the throttle position is identified by the engine control system?
11. What is the necessity for measuring the Steering position and Steering torque and how they are measured?

UNIT III: SI ENGINE MANAGEMENT

1. Explain the working of Bosch electronic systems.
2. Explain about electronic ignition system. (Nov/Dec 2012)
3. Explain the working of 3 way catalytic converter. (Nov/ Dec 2012)
4. Explain a simple fuel injection system.
5. Discuss the various components of any one electronic engine management system of SI engine in detail. (Nov/Dec 2011)
6. Explain the construction and working principle of a three way catalytic converter with neat sketch and discuss the efficiency versus lambda with a suitable graph. (AU2008)
7. I. Explain the layout and working of group and sequential injection system
   II. Explain the fuel system components and their appropriate work in the fuel system
8. What are the various phases used in S I Engines to meet out the various speed and load conditions.
9. Explain the control systems used in fuel system and what is the function of lambda sensor in closed loop control system
10. Briefly explain, How the ignition control system works in an engine management system and what is the function of knock sensor in engine management system?

UNIT IV: CI ENGINE MANAGEMENT

1. Explain about Pilot, main, advanced post injection and retarded post injection.
2. Explain about Electronically controlled Unit Injection system. (Nov/Dec 2011 & 2012)
3. Draw the Layout of the common rail fuel injection system and the working of its components. (Nov/Dec 2011 & 2012)
4. Discuss the Fuel injection system parameters affecting combustion, noise and emissions in CI engines. (Nov/Dec 2011)
5. a) What is a unit injector? How does it differ from common rail system? (AU2008)
   b) Discuss in detail the various components of an electronically controlled common rail fuel injection system with a neat sketch. (AU2008)
6. Write short notes on the following (AU2008)
   i) Noise emission in CI engines
   ii) Pilot fuel injection
   iii) Fuel injection parameters affecting combustion.
7a) Explain the common rail fuel injection system with a neat diagram
   b) Explain the working method of fuel injector with neat sketch.
8. What is the requirement of E G R in the CI Management system and how it controls the Emission from The C I Engine?

UNIT V: VEHICLE MANAGEMENT SYSTEMS

1. Explain ABS system, its need, layout and working. (Nov/Dec 2011 & 2012)
3. a) Explain the working of Electric power steering, (Nov/Dec 2011)
   b) Explain working of air bag system
4. Explain seat belt tightening system.
5. Explain cruise control system.
6. Explain vehicle tracking system.
7. Explain On board diagnostics (OBD I & II). (Nov/Dec 2011)
8. Explain Collision avoidance Radar warning system.