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K 4407

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Seventh Semester

Mechatronics Engineering

MH 1402 — AUTOMOTIVE ELECTRONICS

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Name the main pollutants emitted by the automobile engines.
2. Why are alternators preferred over D.C. generators in the charging system of automobiles?
3. Briefly explain the operating principle of a spark ignited internal combustion engine.
4. What is the need of a condenser in a Battery coil ignition system?
5. Why is coolant temperature constantly monitored in an electronically managed engine control system?
6. What is the principle of operation of a Hall effect sensor?
7. Distinguish open loop control and feedback control system, as used in engine management.
8. What is meant by on board diagnostic system in automobiles?
9. What are the differences between traction control and antilock braking system?
10. What is EMI suppression in automobiles?

PART B — (5 × 16 = 80 marks)

11. (a) Discuss the evolution of electronics in automobiles and justify the cost involved in automotive electronics.

Or

- (b) With the aid of a circuit diagram explain a typical charging system of a vehicle having a three phase alternator.
12. (a) Sketch and explain the different types of cylinder arrangements for multicylinder internal combustion engines.

Or

- (b) Explain different types of non contact type triggering devices used in Electronic ignition system.
13. (a) Give the theory of operation and construction of the following sensors used in automobile
- (i) Mass Air flow sensor
 - (ii) Throttle position sensor
 - (iii) Coolant temperature sensor
 - (iv) Exhaust gas oxygen sensor.

Or

- (b) Explain different types of actuators used in the engine management system of an electronically controlled petrol engine.
14. (a) List out and explain the different engine operating modes for an electronically controlled engine management system for a petrol engine car.

Or

- (b) With the aid of block diagram explain the fuel control and ignition control of a typical electronically controlled engine management system of a spark ignited engine.

15. (a) Explain Cruise control system and Adaptive Cruise control system in vehicles.

Or

(b) Write notes on the following :

- (i) CAN standard
- (ii) Electronic suspension system
- (iii) Air bags in passenger cars
- (iv) Climate control in cars.

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