



B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2009)

Sixth Semester

AUTOMOBILE ENGINEERING

AUE116 : Advanced Automotive Systems

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Microprocessor based diagnostic testers can:
 - a) only read fault codes
 - b) read fault codes and perform actuator tests via the serial port of the vehicle
 - c) reset the values stored in a mask programmable ROM
 - d) only read out diagnostic data from CAN systems
2. A Hall effect sensor
 - a) Gives an increase in the signal current as the speed increases
 - b) Shuts off current in the Hall element so that the signal voltage is zero when the magnetic field is blocked
 - c) Is only used in ignition systems
 - d) Generates electricity
3. The purpose of exhaust gas recirculation is:
 - a) To return the exhaust gases
 - b) To reduce combustion temperature and reduce NOx emissions
 - c) To increase power output
 - d) To give better fuel economy
4. The main ECU 'input' parameters for calculating ignition timing and injector duration are:
 - a) speed and temperature
 - b) speed and load
 - c) pressure and temperature
 - d) pressure and load
5. In standardized fault codes:
 - a) digit 1, at the left-hand end, identifies the vehicle system
 - b) The digit at the far-right hand end identifies the system
 - c) all computer controlled vehicle systems must use them
 - d) the identifying digits can appear in any order

6. OBD II is mainly concerned with:
 - a) emissions related problems
 - b) vehicles fitted with traction control systems
 - c) making it easier for owner drivers to service their own vehicles
 - d) reducing the fuel consumption of vehicles
7. Which of the following is considered to be an active safety feature:
 - a) Good road holding
 - b) Side airbags
 - c) Seat belt tensioner
 - d) All of the above
8. To prevent the risk of accidental deployment of an airbag:
 - a) remove the SRS fuse and wait 10 minutes
 - b) remove the SRS fuse and discharge the capacitors manually
 - c) wait 10 seconds and remove the SRS fuse
 - d) wait 10 seconds and discharge the capacitors manually
9. Remote keyless entry systems has the following features:
 - a) Unidirectional code transmission
 - b) Frequency range lies between 315-900 MHz
 - c) Both a and b
 - d) Bidirectional code transmission
10. An inertial navigation system incorporates the following sensors
 - a) radio receivers
 - b) Doppler radar
 - c) gyros and accelerometers
 - d) All of the above

PART B (10 x 2 = 20 Marks)

11. State the significance of electronics in automobiles.
12. Write short notes on Crash sensors.
13. Draw the characteristic curve of excess-air-factor (λ) on pollutant composition in untreated exhaust gas. Also comment on conditions: $\lambda < 1$ and $\lambda > 1$.
14. Give the advantages of electronic ignition system compared with the normal contact breaker system.
15. What are the diagnostic methods available for obtaining fault codes?
16. What is anti slip regulation?
17. Mention some of the active and passive safety systems.
18. State four advantages of an intelligent airbag.
19. What is driver assistance system? List some of the driver assistance systems.
20. List the basic components used in automotive vision system.

PART C (5 x 14 = 70 Marks)

21. a) Explain the role of Electronic Control Unit (ECU), sensors and actuators that are

being used in a vehicle. Illustrate the process how data is being acquired from a sensor and is being processed to an actuator through ECU with neat block diagram stating the functions of each block.

(OR)

- b) Identify the components of the electronic Engine Management System and explain the working of the same stating the different modes of operation of EMS.

22. a) Describe the single point and multi point injection system with neat sketch.

(OR)

- b) List the types of solid state ignition system and state the purpose and working of each component with necessary diagrams.

23. a) Give the different systems available to stabilize a vehicle. Elaborately explain any two of them.

(OR)

- b) (i) Write short notes on: On board diagnosis system. (6)
(ii) Briefly explain collision avoidance system with an aid of adaptive cruise control (8) and also compare with that of cruise control.

24. a) Write short notes on:
a) Airbags
b) Seat belt pretensioner systems with relevant diagram.

(OR)

- b) Elaborately explain the driver monitoring system.

25. a) Elaborate on:
a) Power Windows
b) Remote keyless entry systems
c) lane departure warning system.

(OR)

- b) (i) Explain how GPS is used as an infotainment system in automobiles. (7)
(ii) Write short notes on Navigation systems (7)
