B.TECH(AUTOMOBILE ENGG.), 2014

AUTOMOTIVE ELECTRONICS & MICROCONTROLLERS

PAPER CODE: AE 310

PAPER ID:[A0723]

MAXIMUM MARKS: 60 **TIME ALLOWED: 3 HOURS**

SECTION – A

Q 1. Answer the following. Each part carries **2 marks**.

(a) Why is an operational amplifier used in inverting mode? How does its gain differ from that of an non-inverting amplifier?

(b) A microprocessor uses eight address lines for accessing memory. What is the maximum number of memory locations that can be addressed?

(c) What is the purpose of ALE pin connection in 8051 microcontroller?

(d) *What is the difference between 'direct injection' and 'indirect injection' in SI* engines?

(e) Why does an electronic ignition system have a longer life than the conventional electrical systems?

(f) What are the advantages of using electronic transmission management system in automobiles?

(g) How is variable damping achieved in electronically controlled shock absorbers?

(h) How does ABS prevent skidding of automobiles? Does it ensure proper braking during turning also?

(i) List the various common components of antilock braking system and traction control system.

(j) What is the role of an immobilizer in an automobile security system?

SECTION – B

Note: Attempt any **four** questions. Each question carries **5 marks**.

Q 2. With the help of a neat sketch explain the construction and operation of a typical oxygen sensor used in vehicles.

Q 3. Write a short note on CAN bus communication usage in automobiles.

Q 4. Discuss the construction and working of a diode and a thyristor. What is the difference between the two devices?

Q 5. What is an injection timer? Explain its functioning in diesel fuel supply systems.

Q 6. Discuss the advantages of electric vehicles over the conventional vehicles running on fossil fuel.

SECTION – C

Note: Attempt any **two** questions. Each question carries **10 marks**.

Q 7. Discuss the components and working of traction control system? How is it different from anti-lock braking system?

Q 8. Explain the working of electronic petrol injection systems used in modern cars, discussing the roles of sensors, injectors and engine control unit.

Q 9. What are the various modern shift control techniques available in modern cars? How do they differ from automatic transmission systems?