

Roll No.

Total No. of Questions : 09]

[Total No. of Pages : 02

B. Tech. (Sem. – 6th)

AUTOMOTIVE ELECTRONICS AND MICROCONTROLLERS

SUBJECT CODE : AE – 310

Paper ID : [A0723]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 × 2 = 20)

- a) Draw a labelled schematic symbol of a common emitter transistor and briefly discuss its voltage-current characteristics?
- b) A memory chip has 8 data lines and 16 address lines. What will be its size.
- c) What is the purpose of PSEN pin connection in 8051 microcontroller?
- d) What is the difference between 'continuous injection' and 'pulsed injection' in SI engines?
- e) Why is the electronic ignition system better suited especially for modern automotive engines?
- f) List the various sensors employed in electronic transmission management system?
- g) What are the advantages of using electronically controlled shock absorbers in automobiles?
- h) What is the difference between three-channel and four-channel ABS?
- i) Differentiate between antilock braking system and traction control system.
- j) What do you understand by key-less entry in cars?

Section - B**(4 × 5 = 20)**

- Q2)** With the aid of sketch explain the construction and working of Mass Air Flow sensor.
- Q3)** Discuss the microcontroller based control of a stepper motor.
- Q4)** Discuss the function and working of a Hall-effect type timer used in electronic ignition systems.
- Q5)** Discuss the main system components of modern common rail fuel injection system.
- Q6)** What are the functions performed by electric motor in hybrid vehicles? List the various types of hybrid vehicles.

Section - C**(2 × 10 = 20)**

- Q7)** What do you understand by anti-lock braking? Draw a schematic diagram showing major components of an ABS in a car. Discuss the role of the different components in the functioning of ABS.
- Q8)** Compare electronic petrol injection technique with carburettor method. Classify the types of petrol injection systems based upon the location and number of injectors.
- Q9)** Discuss the various components of an electronic transmission control system. What are its advantages and disadvantages over manual transmission systems?

