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**M.E. / M.TECH. DEGREE EXAMINATIONS, DEC 2019**

Third Semester

**MS18018 – AUTOMOTIVE ELECTRONICS***(Mechatronics)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**Answer **ALL** questions**PART A - (10 X 2 = 20 Marks)**

	<b>CO</b>	<b>RBT</b>
1. Describe the purpose of Ignition system.	<b>1</b>	<b>U</b>
2. What is the need of altitude and ambient temperature compensation in an electronically managed engine?	<b>1</b>	<b>R</b>
3. Give a list of the various types of sensors used in the MPFI petrol engine.	<b>2</b>	<b>R</b>
4. State the information provided by a throttle potentiometer.	<b>2</b>	<b>U</b>
5. How deceleration leaning of the mixture is achieved in an engine having a closed loop control system?	<b>3</b>	<b>R</b>
6. Differentiate Throttle body Injection and Multi port fuel injection system.	<b>3</b>	<b>U</b>
7. Describe the purpose of on-board diagnostics (OBD).	<b>4</b>	<b>U</b>
8. Define the term, 'driver information'.	<b>4</b>	<b>R</b>
9. Write about bus system and network in vehicles.	<b>5</b>	<b>R</b>
10. List five typical outputs of a trip computer and the inputs required to calculate each of them.	<b>5</b>	<b>R</b>

**PART B - (5 X16 = 80 Marks)**

11. (a) (i) Explain the working principle of four-stroke cycle of S.I Engine. **(8)** **1** **U**
- (ii) With the help of a diagram, define parameters of an internal combustion engine: **(8)** **1** **U**
- a) Cylinder Bore.
  - b) Piston area.
  - c) Stroke
  - d) TDC and BDC.

**(OR)**

- (b) With aid of sketch explain the various components of an electronic engine management system. **(16)** **1** **U**

12. (a) (i) Sketch and explain the working of solenoids and stepper motors as actuators in vehicle. **(10) 2 R**
- (ii) Explain in detail about variable valve timing. **(6) 2 R**
- (OR)**
- (b) Write notes on the following: **(16) 2 R**
- i) Manifold Air pressure sensor
  - ii) Crank shaft position sensor
  - iii) Oxygen sensor
  - iv) Knock Sensor.
13. (a) With the aid of block diagram and flow charts explain the starting and acceleration enrichment of the Fuel Injection system of a petrol car having electronic engine management. **(16) 3 U**
- (OR)**
- (b) (i) Describe in detail about Electronic stability program (ESP). **(8) 3 U**
- (ii) What is the use of Secondary Air? With the help of a diagram explain how the secondary air is controlled. **(8) 3 U**
14. (a) Describe, with the aid of a block diagram, the operation of an Autonomous Cruise Control (ACC) system. **(16) 4 U**
- (OR)**
- (b) (i) Explain in detail about the safety system **(10) 4 U**
- a) Supplemental Restraint System (SRS)
  - b) Blind Spot Avoidance
- (ii) Write short notes parking assist system. **(6) 4 U**
15. (a) (i) Explain the use of CAN PROTOCOL in vehicles. **(8) 5 U**
- (ii) Write short notes on Telematics. **(4) 5 U**
- (iii) State the advantages of GPS navigation and Telematics in automotive. **(4) 5 U**
- (OR)**
- (b) (i) Describe in detail about the GPS navigation and its system structure. **(10) 5 U**
- (ii) Write short notes on computer-based instrumentation display devices in automotive. **(6) 5 U**