B.E./B.TECH Degree Examination, December 2020

Fifth Semester

AE18501 -Automotive Electrical, Electronics and Microcontroller Systems

(Regulation 2018)

Time: Three hours Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. Contact breaker should be set
   (a) just before starting the engine
   (b) before adjustment of dwell angle
   (c) after adjustment of dwell angle
   (d) before setting spark plug gap
2. Common rail injection system uses injection pressures of the order…….
   (a) 100–200 bar
   (b) 200–400 bar
   (c) 400–600 bar
   (d) 1500 bar
3. Why starters are required in a DC motor?
   a) Back emf of these motors is zero initially
   b) These motors are not self-starting
   c) These motors have high starting torque
   d) To restrict armature current as there is no back emf at starting
4. Why 'Bumpers' are used in cars
   a) To reduce the impact in case of low speed collisions
   b) To improve the aerodynamics of a car
   c) To increase the engine performance
   d) None of the mentioned
5. Describe the two styles of stator windings.
6. Under what condition the ballast resistor in an ignition system's primary circuit is bypassed?
7. Explain the purpose of the TPS input in a speed-density fuel injection system.
8. Describe the term passive restraint system.

PART B - (4 X16 = 64 marks)

09. (a) Discuss the most common type of starter motor used today which incorporates the overrunning clutch starter drive. **(16)**

(OR)

(b) Draw the wiring circuit of 'Y' type stator alternator by showing the action of changing alternating current to direct current **(16)**

10. (a) How the PCM fires the spark plugs in the proper firing order of a distributor less ignition system and elaborate with relevant diagrams. **(16)**

(OR)

(b) In Diesel engines, briefly explain how the computer controls the air fuel ratio on a CRDI system. **(16)**

11. (a) (i) Explain the sensor that works on a closed loop function, which monitors the exhaust and changes the input condition for reduced pollution in IC engines. **(10)**

(ii) Explain the operation of a sensor, which monitors the abnormal combustion in SI engine. **(6)**

(OR)

(b) What system that guides the driver to reach the destination without knowing the route and explain its working. **(16)**

12. (a) During emergency braking, explain the system that prevents the wheel locking and act as an active safety in a vehicle. **(16)**

(OR)

(b) Explain an operation of a Passive safety system, which prevents the driver and passenger in hitting the dash board during an accident. **(16)**