

B.E./B.Tech. Degree Examination, September 2020

Semester - VIII

**EE16022 AUTOMOTIVE ELECTRONICS AND ELECTRIC VEHICLES**

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. A piece of safety equipment that prevents the wheels of a vehicle from locking up under emergency, panic, or harsh braking conditions is (a) EMS (b)ABS (c)ICL
2. Suitable ignition system for high engine RPM is (a) Battery operated (b) Electronics Based
3. According to weight which motor can be chosen for EV applications  
(a)DC motor (b) PM DC Motor (c)Induction motor (d)SRM
4. Which one is having high temperature sensitivity? (a) RTD (b) Thermistor.
5. How will you assess the performance of vehicle?
6. Could decoupled field and torque control be achieved in Induction motor? How?
7. List out the functions of Electric Equipment ECU.
8. What is hot wire air flow sensor?

**PART B - (4 X16 = 64 marks)**

09. (a) (i) Explain steps involved in Electric vehicle power train sizing. **(8)**  
(ii) Briefly Explain about EMS and ABS. **(8)**  
**(OR)**  
(b) Discuss Environmental conditions based Electrical and operating-key requirements of automotive systems in detail. **(16)**
10. (a) Describe the vector control of induction motor in detail by deriving dq model from the basics. **(16)**  
**(OR)**  
(b) (i) Compare Fuel Cell and Ultra Capacitors in various aspects. **(8)**  
(ii) How will you choose a motor for an Electric Vehicle? Discuss with respect to different requirements of EV. **(8)**
11. (a) (i) Compare Battery, Magneto and Electronics ignition systems. **(8)**  
(ii) Describe architecture of an ECU which controls the motor drive to develop the desired torque. **(8)**  
**(OR)**  
(b) (i) Draw and explain starting system of a vehicle in detail. **(8)**  
(ii) Express the importance of ignition advance and Firing order in producing number of spark in a petrol Engine with examples. **(8)**

12. (a) (i) Mention Four Electric Vehicle variants available in the market with basic specifications. (4)
- (ii) Explain all actuators available in any one of the variants above. (12)
- (OR)**
- (b) (i) Mention Four Electric Vehicle variants available in the market with basic specifications. (4)
- (ii) Explain all sensors available in any one of the variants above. (12)