

V SEMESTER B.TECH. (AUTOMOBILE ENGINEERING) END SEMESTER EXAMINATIONS, NOV/DEC 2018

SUBJECT: AUTOTRONICS [AAE 3151]

REVISED CREDIT SYSTEM (21/12/2018)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitable assumed.
- 1A. Describe torque ripple. Where does it originate from and how can it be (02) reduced?
- 1B. Explain the concept of third harmonics. How does it originate in AC Generators? (03)Suggest a method by which, these can be made beneficial.
- 1C. A DC motor of 8 poles, lap wound, is provided with 240V_{DC} Supply. The back (05) emf generated by the motor is 140V, at a speed of 600 rad/s. Find the Voltage Constant as well as the speed of the motor if a frictional torque of 20Nm acts on it. Torque Constant is 0.5 Nm/A, armature resistance is 1.5 Ω, and armature current is 60 A.
- 2A. State the substantial features while performing wiring harshness of a vehicle. (02)
- **2B.** Write short notes on the following Sensor Characteristics (03)
 - I. Repeatability and Readability
 - II. Bias and Hysteresis
- 2C. Explain the various driving modes of stepper motors with the help of a diagram. (05)
- **3A.** What is wiring harshness? Classify them. (02)
- **3B.** What is the importance of Throttle Screw in TPS? Depict the characteristic **(03)** curves of TPS
- **3C.** What is a Voltage divider? With a neat sketch explain the construction and **(05)** working of the voltage divider. Mention its application in automobiles.

- **4A.** Justify why are Titanium type UEGO sensor better when compared to the **(02)** zirconia type UEGO sensor.
- **4B.** With illustrations explain the various types of wiring harshness layouts. **(03)**
- **4C.** Explain the working of the comparator with positive feedback and justify its **(05)** usage with an engine speed sensor.
- **5A.** Explain the importance of network coupling. (02)
- 5B. What is ISO 9141-2 protocol? Mention its salient features with its (03) disadvantages. Also, mention the baud rates and delivery of J1850 and ISO 9141-2.
- **5C.** Discuss the functioning of Solenoid controlled Fuel Injectors with the aid of a **(05)** schematic picture.