VIT
Vellore Institute of Technology

Final Assessment Test – November 2019

Course: MEE1035 - Automotive Electricals
Class NBR(s): 2005
Time: Three Hours
Slot: B1+TB1
Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS EXAM MALPRACTICE

General Instructions:
i) Make the sketches neatly
ii) Avoid writing irrelevant answers
iii) Assume suitable data if required

Answer any TEN Questions
(10 X 10 = 100 Marks)

1. A resistor of 80 Ohms resistance, having a temperature coefficient of 0.0021 per degree C is to be constructed. Wires of two materials of suitable cross-sectional area are available. For material A, the resistance is 80 Ohm per 100 meters and the temperature coefficient is 0.003 per degree C. For material B, the corresponding figures are 60 Ohm per meter and 0.0015 per degree C. Calculate suitable lengths of wires of materials A and B to be connected in series to construct the required resistor. All data are referred to the same temperature.
2. With a neat sketch explain the construction and working principle of Sodium Sulphur battery. What are the limitations of these batteries? (10) 300-350, Sulphur is dangerous. Sodium can burn.
3. With relevant graphs, explain the internal resistance of typical lead acid battery? (5)
4. With neat sketch explain the construction and working of inertia starters used in the automotive vehicles. (10)
5. Explain with neat sketch, the working of current-voltage regulator used in the automotive vehicles.
6. Explain with neat sketch the mechanisms that are used to adjust the spark timing depending on the speed and load in automotive engines. (10)
7. Self-discharge is one of the major problems associated with any batteries. Explain the factors that contribute for the self-discharge and methods to overcome it. (7)
8. With neat sketch explain the various head lamp systems used in vehicles. Also explain the need for the head lamp levelling in a vehicle and how it is done with neat sketch. (5)
9. With neat sketch explain the construction and working of halogen lamps used in automotive vehicles. 10
10. Explain with neat sketches the rectification process employed in an alternator used in automotive applications. (8)
11. Electromagnetic interference is one of the problems associated with automotive vehicles. Explain how it can be suppressed in a typical vehicle? Looping, Bypass Capacitor, Shielding (5)
12. With neat sketch and equations Explain the operating principle of Lead Acid battery during charging and discharging. (5)

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