MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : AUE-702

AUTOMOTIVE ELECTRICAL SYSTEMS AND ELECTRONICS

Time Allotted : 3 Hours | *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) Increase in the plate area of a battery cell increases
      a) the current
      b) the voltage
      c) the internal resistance
      d) none of these.

   ii) The liquid used in a battery which is a mixture of sulphuric acid & water is called
      a) electrolyte b) electro-liquid
      c) electro-chemicals d) none of these.

   iii) Megger is used for
      a) testing the insulation resistance of a circuit
      b) measuring the resistance of the order of mega ohms
      c) testing the voltage & current
      d) both (a) & (b).

   iv) The increase in temperature of a conductor results
      a) increase in resistance
      b) reduction in resistance
      c) no effect in resistance.

   v) While setting the spark-plug electrode gap, one should
      a) use only a round wire gauge
      b) use only a flat feeler gauge
      c) use none of these.

   vi) It is common practice to test ignition coils with the help of
      a) spark-gap tester
      b) neon-tube tester
      c) high-frequency coil tester
      d) oscilloscope.

   vii) Transducer means
      a) the device that converts one type of signal to others
      b) the device that consumes any type of signal
      c) the device generates signal
      d) none of these.

viii) Stain gauge is
- a) a device that measure stress
- b) a device that measures strain
- c) a device that measures stress and strain
- d) none of these.

ix) Thermistor means
- a) thermally sensitive resistor
- b) temperature does not have any influence on it
- c) this is not a resistor
- d) none of these.

x) Capacitive transducer means
- a) it works on the principle of capacitance change
- b) it does not have any influence of capacitance
- c) it has the influence of inductance
- d) none of these.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What are the basic types of d.c. machines ? Discuss self-excited d.c. machines by suitable diagram.
3. What is headlight dazzle ? Discuss the various causes of dazzle.
4. Discuss the various troubles of the ignition system which are likely to be encountered while running a vehicle and their remedies.
5. What do you mean by LVDT ? Draw the suitable circuit diagram for LVDT and explain its operation.
6. Give one suitable example of resistive transducer. Then draw the suitable circuit of that one and explain its operation.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. With a neat diagram explain the principle & construction of an automobile starter motor. Briefly explain the function of starter switches. 10 + 5
8. Briefly explain the electronic ignition system. Write its advantages. What do you mean by Engine cranking & warm up control. 7 + 2 + 6
9. How do you control the Head light beam ? Explain with schematic diagram. What is ignition warning light ? Explain the same with diagram. 4 + 4 + 3 + 4
10. What do you mean by integrated engine .control system ? Draw the block diagram of this system and explain its operation. Why do we need emission control ? Explain the process of exhaust emission control. 2 + 6 + 2 + 5
11. Write short notes on any *three* of the following : 3 × 5
    - a) Speedometer
    - b) Head light & side light
    - c) Wiper system
    - d) Electronic Ignition system
    - e) Feedback carburetor
    - f) Thermocouple.