MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

AUE-702

AUTOMOTIVE ELECTRICAL AND ELECTRONICS SYSTEM

Time Allotted: 3 Hours | Full Marks: 70

The questions are of equal value.
The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP A
(Multiple Choice Type Questions)

1. Answer *all* questions. $10 \times 1 = 10$

(i) The cam angle is the number of degrees that the cam rotates while the contact points are

(A) closing (B) closed
(C) opening (D) opened

(ii) In a open loop control system

(A) the input has control over output (B) input has no control over output
(C) both (A) and (B) (D) none of these

(iii) The substance that strongly oppose the movement of electrons through them are referred to as

(A) insulator (B) semiconductor
(C) plasma (D) super conductors

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(iv) Dead weight tester is used for

(A) testing dead weight (B) measuring pressure accurately
(C) producing high pressure (D) calibrating pressure instruments

(v) In what way you can determine the healthy condition of battery?

(A) electrolyte specific gravity (B) terminal voltage
(C) internal resistance (D) none of these

(vi) During discharging of a battery, the active material in both the plates is charged to

(A) spongy lead (B) lead oxide
(C) lead sulphate (D) none of these

(vii) The heat range of a spark plug is determined by

(A) how hot the insulator of the spark plug can get before it cranks
(B) it's spark intensity
(C) the ability of the spark plug to transfer heat from the tip of the insulator to the water cooling system
(D) none of these

(viii) The armature reaction phenomena happens for

(A) DC motor (B) Generator
(C) Spark plug (D) Starter motor

(ix) The increase in temperature of a conductor results

(A) increase in resistance (B) reduction in resistance
(C) no effect in resistance (D) none of these

(x) While adjusting the ignition timing results

(A) rotation of distributer (B) reposition of crank shaft pulley
(C) both (A) and (B) (D) none of these

GROUP B
(Short Answer Type Questions)

Answer any *three* questions. 3×5 = 15

2. Draw the block diagram of a closed loop control system and explain the same by a suitable example.

3. Discuss the working principle of Stepper Motor. What is it's application in Automobile Industry?

4. Discuss the working principle of LVDT. What are the advantages and disadvantages of this instrument?

5. Discuss the basic principle of Odometer. What are the application areas of Odometer? Explain.

6. Define Transfer function with a generalized example.

GROUP C
(Long Answer Type Questions)

Answer any *three* questions. 3×15 = 45

7. How the speed control mechanism is achieved in case of D.C. motors? What are the use of commutator and brush in operation of a D.C. generator? What is voltage Build-up for a DC shunt generator? Explain. Draw different characteristics of DC motor and explain. 5+2+4+4

8. Define sensor and transducer. Explain the basic principle of a strain gauge pressure transducer by a suitable schematic diagram. What are the advantages and disadvantages of strain gauge transducer over other pressure transducer? 4+7+4

9. Briefly explain the electronic ignition system. Write its advantage. What do you mean by Engine cranking and warm up control? 7+2+6

10. Draw a neat wiring diagram of the modern type of night and day signaling system which prevents dazzling effects on drivers approaching from rear. Label all the parts. 10+5

11. Write short notes on any *three* of the following: 3×5
    (a) RVDT
    (b) Horn Relay
    (c) Head Light and Side Light
    (d) Automobile Starter motor.