Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech/(AUE-NEW)/SEM-7/AUE-702/2013-14

2013

AUTOMOTIVE ELECTRICAL AND ELECTRONICS SYSTEMS

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) Which of the following is the flow sensor ?

a) Thermocouple b) Nozzle

c) Strain gauge d) Pyrometer.

ii) In an open loop control system

a) the input has control over output

b) input has no control over output

c) both are true

d) none is true.

iii) A transducer is a device which

a) converts energy from one form to another

b) when actuated by energy in one transmission system, supplies energy in the same form or in another form to a second transmission system

c) both (a) & (b)

d) none of these.

iv) Increase in the plate area of a battery cell increases

a) the current

b) the voltage

c) the internal resistance

d) none of these.

v) 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.

vi) 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) its spark intensity

c) the ability of the spark plug to transfer heat from the tip of the insulator to the water cooling system.

vii) Dead weight tester is used for

a) testing dead weight

b) measuring pressure accurately

c) producing high pressure

d) calibrating pressure instruments.

viii) A resistor in a spark plug

a) exerts an excessive strain on the ignition coil & on the rest of the ignition system

b) describes the spark plug life

c) increases spark plug electrode life & suppresses radio interferences.

ix) During discharging of a battery, the active material in both the plates in charged to

a) spongy lead b) lead oxide

c) lead sulphate d) none of these.

x) 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.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

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

3. Discuss the working principle of LVDT. What are the advantages & disadvantages of this instrument ?

4. Why are transformers used in Automobile systems ? Discuss the basic principle of transformer.

5. What are the basic types of d.c. machines ? Discuss self-excited d.c. machines by suitable diagram.

6. Discuss the Torque equation of a d.c. machine.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. With a neat diagram explain the principle & construction of an Automobile starter motor. Briefly explain the function of starter switches. 10 + 5

8. Define sensor & transducer.

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

9. What is transfer function ? Find the transfer function for the given electrical system & also find the condition of stability for the given system. What is the utility of using frequency domain in control system analysis ? 4 + 7 + 2 + 2

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

11. Write short notes on any *two* of the following : $2 \times 7\frac{1}{2}$

a) Speedometer

b) Horn Relay

c) Trafficator

d) Head Light & Side Light.