Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[4857]-1020

S.E. (Mechanical/Mechanical Sandwich, Automobile)

(Second Semester) EXAMINATION, 2015

ELECTRONICS AND ELECTRICAL ENGINEERING

(2012 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Answer Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6** and Q. No. **7** *or* Q. No. **8**.

(*ii*) Figures to the right indicate full marks.

(*iii*) Neat diagrams must be drawn wherever necessary.

(*iv*) Use of non-programmable scientific calculator is allowed.

(*v*) Assume suitable data wherever necessary and state the same clearly.

1. (*a*) Write the function of each register in the register set of 8051 microcontroller. [6]

(*b*) Explain the function of TMOD register along with significance of mode bits. [6]

Or

2. (*a*) Distinguish between serial and parallel data transfer schemes. State special function registers used for such communication in 8051 microcontroller. [6]

(*b*) Draw architectural block diagram of 8051 microcontroller. [6]

P.T.O.

3. (*a*) Derive the expression for torque developed by three phase induction motor. [6]

(*b*) A 250 V DC shunt motor has armature resistance of 0.25 Ω. It takes armature current of 50 A while running at 750 rpm on certain load. If the flux of the motor is reduced by 10% without changing the load torque, find the new speed of the motor. [7]

Or

4. (*a*) Explain the working of three point starter for DC Shunt motor with the help of neat schematic. [6]

(*b*) Deduce the relationship between : [7]

(*i*) Rotor copper loss and rotor input

(*ii*) Rotor gross output and rotor input

(*iii*) Rotor copper loss and rotor gross output in case of three phase induction motor.

5. (*a*) Explain the operation of basic digital multimeter with the help of block diagram. [6]

(*b*) Describe the measurement of frequency and phase by using cathode ray oscilloscope. [6]

Or

6. (*a*) Explain the working of audio signal generator with the help of block diagram. [6]

(*b*) Mention typical specifications of the following instruments used in electronics and electrical engineering laboratories : [6]

(*i*) Digital voltmeter

(*ii*) Frequency counter.

7. (*a*) Obtain the condition of bridge balance for frequency measurement using Wien's Bridge. [6]

(*b*) Discuss two wattmeter method for the measurement of active power drawn by three phase star connected balanced inductive load with the help of connection diagram and phasor diagram. [7]

Or

8. (*a*) Describe measurement of peak value of voltage using Sphere Gap with the help of neat schematic. [6]

(*b*) Three choke coils each with a resistance of 10 Ω and a reactance of 10 Ω are connected in star across a 3-phase, 400 V, ac supply. Calculate line current and readings of the two wattmeters connected to measure the power. What is the total power drawn by the load ? [7]