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

Seat No.	

[5152]-120

S.E. (Mechanical, Mech. Sandwich and Automobile) (II Sem.)

EXAMINATION, 2017

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**, Q. No. **7** *or* Q. No. **8**.

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

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

(*iv*) Assume suitable data, if necessary.

1. (*a*) Write important features of architecture of 8051 micro-controller. [6]

(*b*) Explain TMOD register along with operating modes provided by it. [6]

Or

2. (*a*) Explain asynchronous and synchronous data transfer formats. [6]

(*b*) Explain addressing modes supported by 8051 microcontroller; quoting *one* example each. [6]

3. (*a*) Obtain generalized expression for torque in a dc motor with usual notations. What is lost torque ? [6]

P.T.O.

(*b*) The useful full load torque of 3-phase, 6-pole, 50 Hz induction motor is 162.84 N-m. The rotor emf is observed to make 90 cycles per minute. Calculate : [7]

(*i*) motor output

(*ii*) rotor copper loss

(*iii*) motor input and

(*iv*) efficiency if mechanical torque lost in windage and friction is 20.36 N-m and stator losses are 830 W.

Or

4. (*a*) Draw and explain the torque -slip characteristics of an induction motor. [6]

(*b*) A dc series motor drives a load : the torque of which varies as the square of the speed. The motor takes a current of 15A when the speed is 600 rpm. Calculate the speed and the current when the motor field winding is shunted by a diverter of the same resistance as that of the field winding. The armature and field voltage drops are negligible. [7]

5. (*a*) What are advantages of digital voltmeters over analog voltmeters ? State limitations of digital voltmeters. [6]

(*b*) Explain the working of Cathode Ray Oscilloscope (CRO) with the help of block diagram. [6]

Or

6. (*a*) Explain the working of digital frequency counter with the help of block diagram. [6]

(*b*) Discuss measurement of voltage, current and phase by using Cathode Ray Oscilloscope (CRO). [6]

7. (*a*) Discuss the working of Maxwell's Bridge for measurement of unknown inductance. [6]

(*b*) Draw the connection diagram for two wattmeter method used to measure active power in a three-phase circuit.

In an industrial application, the total power is 100 kW and power factor is 0.66 leading for a certain load. Calculate the reading of each wattmeter. For what power factor will one of the wattmeters read zero ? [7]

Or

8. (*a*) Discuss one wattmeter method for measurement of reactive power with the help of connection diagram and phasor diagram. [6]

(*b*) Explain the use of Sphere Gaps for measurement of peak value of high voltages. State merits and demerits offered by this method. Mention precautions to be taken while working with Sphere Gaps. [7]