Total No. of Questions—**8**] [Total No. of Printed Pages—**2**

Seat No.	

[5352]-520

S.E. (Mechanical, Mech. Sandwich & Automobile)
(II Sem.) EXAMINATION, 2018
ELECTRICAL AND ELECTRONICS ENGINEERING
(2015 PATTERN)

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

N.B. :— (*i*) Attempt 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.

Q.1 **(a)** Derive an expression for torque developed in three phase induction motor under running conditions. **6**

(b) The input power supplied to a 500 V, DC shunt motor is 8776 W. It is desired to reduce the speed of the motor by 30% by inserting a resistance in the armature circuit; keeping the shunt field and armature current unchanged. The resistances of the field and armature windings are 400 Ω and 0.25 Ω respectively. Calculate the value of the inserted resistance. **7**

(OR)

Q.2 **(a)** Derive an expression for armature torque developed in a DC motor. **6**

(b) A 6 pole, 50 Hz, 3-phase induction motor runs at 960 rpm when the torque on the shaft is 200 N-m. if the stator losses are 1500 W and friction and windage losses are 500 W, find (i) rotor copper loss and (ii) efficiency of the motor. **7**

Q.3 **(a)** Explain construction and working principle of Universal Motor. Mention it's any two applications. **6**

(b) Distinguish between a microprocessor and a microcontroller considering *any six* significant points. **6**

P.T.O.

(OR)

Q.4 **(a)** Explain construction and working principle of AC and DC Servo motors with the help of suitable diagrams. **6**

(b) State *any six* significant features of ATmega 328P microcontroller. **6**

Q.5 **(a)** Explain the following functions used to handle GPIO in ATmega 328P based Arduino board with suitable examples:
(i) pinMode( )
(ii) digitalWrite( )
(iii) digitalRead( ) **6**

(b) Draw interfacing circuit diagram of LCD module to Arduino board. Write the basic algorithm followed for this interfacing. **6**

(OR)

Q.6 **(a)** Explain the interfacing of LED with Arduino board with the help of diagram and write an algorithm to blink an LED. **6**

(b) Draw interfacing circuit diagram of 4 x 4 matrix keypad to Arduino board and write the algorithm for interfacing. **6**

Q.7 **(a)** Enlist *any six* significant features of ADC in ATmega 328P based Arduino board. **6**

(b) Draw interfacing circuit diagram of LVDT to Arduino board and explain the algorithm for interfacing. **7**

(OR)

Q.8 **(a)** Explain concept of PWM and draw interfacing circuit diagram of DC Motor to Arduino board in order to control speed of motor. **6**

(b) What is the function of LM35? Explain it's interfacing with Arduino board with the help of circuit diagram. **7**