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

Seat No.	

[5252]-520

S.E. (Mechanical, Mech. Sandwich and Automobile) (Second Semester) EXAMINATION, 2017

ELECTRICAL AND ELECTRONICS ENGINEERING

(2015 PATTERN)

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

N.B. **:—** (*i*) Attempt question Nos. **1** *or* **2**, **3** *or* **4**, **5** *or* **6**, **7** *or* **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*) Derive expression for torque in a 3-phase induction motor and hence obtain equation for standstill condition. [6]

(*b*) A DC shunt motor has armature resistance of 4 ohm. On full load, it runs at 1600 rpm drawing armature current of 10 A from 200 V dc supply. Find full load torque and starting torque assuming that flux is maintained constant. [7]

Or

2. (*a*) The power input to a 3-phase induction motor is 60 kW. The net stator losses are 1 kW. Find the total mechanical power developed and rotor copper loss per phase if motor is running with a slip of 3%. [6]

(*b*) Draw a neat sketch of 4 pole DC machine. Label main parts of it. State the function and material used for construction of any four parts. [7]

P.T.O.

3. (*a*) Differentiate between a microprocessor and a microcontroller. [6]

(*b*) Explain the construction and working of linear induction motor with the help of suitable diagram. Also state its applications. [6]

Or

4. (*a*) Write advantages, disadvantages and applications of Brushless DC motor. [6]

(*b*) Draw the block diagram of typical data acquisition system. Write function of each block. [6]

5. (*a*) Explain the various operating modes of timers in ATmega 328P microcontroller. [6]

(*b*) Explain serial communication using Arduino IDE. Also explain the functions Serial.print() and Serial.printin() with example. [6]

Or

6. (*a*) Draw the diagram of general purpose Arduino board. [6]

(*b*) Explain the interfacing of LED with Arduino board with required functions and write an algorithm to blink an LED. [6]

7. (*a*) Draw ADMUX register and explain the function of each bit in it. [6]

(*b*) Draw and explain the interfacing diagram of ATmega 328P microcontroller to control operation of DC motor using PWM. [7]

Or

8. (*a*) Draw the schematic showing ADC Control and explain each bit of Status Register A. [6]

(*b*) Discuss the working of accelerometer and explain the interfacing of ADXL335 Acceloremeter with ATmega 328P microcontroller with diagram. [7]