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

Seat No.	

[5152]-520

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

(II Sem.) EXAMINATION, 2017

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.

1. (*a*) The power input to 500 V, 50 Hz, 6 pole, 3-phase induction motor running at 975 rpm is 40 kW. The stator losses are 1 kW and friction and windage losses are 2 kW. Calculate :

(*i*) slip

(*ii*) rotor copper losses and

(*iii*) efficiency of motor. [6]

(*b*) Why is a starter necessary for operating DC motors ? Draw neat diagram of three point starter for DC shunt motor and explain the working. Write the function of no-volt coil and overload release. [7]

P.T.O.

Or

2. (*a*) Differentiate between slip ring and squirrel cage induction motor. [6]

(*b*) A 250 V DC shunt motor has an armature resistance of 0.5 ohm and field resistance of 125 ohm. It drives a load at 1000 rpm and takes a current of 25 A. The field circuit resistance is then increased to 150 ohm. Calculate new speed assuming load torque to be constant. [7]

3. (*a*) Write any *six* important features of ATmega 328P micro-controller. [6]

(*b*) Elaborate the construction of variable reluctance stepper motor with the help of suitable sketches and hence explain its Full-step and Half-step modes of operations. [6]

Or

4. (*a*) Describe the constructional details and operation of shaded pole induction motor with the help of appropriate diagrams. [6]

(*b*) Draw bit pattern of status register of ATmega 328P and explain the significance of all bits. [6]

5. (*a*) Explain various timers in ATmega 328 microcontroller. [6]

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

Or

6. (*a*) Explain the following Arduino functions used for serial communication :

(*i*) Serial.begin( )

(*ii*) Serial.end( )

(*iii*) Serial.available( ). [6]

(*b*) Draw interfacing circuit diagram of Arduino board and LCD. Also write basic algorithm used for this interfacing. [6]

7. (*a*) List any six features of in-built ADC in ATmega 328P microcontroller. [6]

(*b*) Explain temperature measurement scheme using LM35 temperature sensor and ATmega 328P microcontroller with the help of interfacing diagram. [7]

Or

8. (*a*) Explain the format of ADCSRB and DIDRO registers mentioning the function of each bit. [6]

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