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]

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]