Total No. of Questions : 8]

SEAT No. : ____

P6101

[Total No. of Pages : 3

[5559]-120
S.E. (Mechanical/Mechanical Sandwich/Automobile)
ELECTRICAL AND ELECTRONICS ENGINEERING
(2015 Pattern)

Time : 2 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of electronic pocket calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Draw the schematic of three point starter used for DC shunt motor. Indicate following components of three point starter and write their functions during operation. **[6]**

i) No - Volt Coil

ii) Overload release

b) The power input to a three phase induction motor is 40 KW. The stator losses are 1 KW and the friction and windage losses are 2 KW. If the motor operates at slip of 4%, find **[7]**

i) Mechanical power developed

ii) Rotor copper loss per phase and

iii) Efficiency of motor

OR

Q2) a) Explain the operation of star - delta starter used for three phase induction motor with the help of neat schematic. **[6]**

b) A 250 V DC shunt motor has armature resistance of 0.25 Ω. It takes an armature current of 50A on certain load while running at 750 rpm. If the flux of the motor is reduced by 10% without charging the load torque, find the new speed of the motor. **[7]**

P.T.O.

Q3) a) Describe construction and working of Universal motor with the help of suitable diagrams and state its any two applications in practice. **[6]**

b) State any six features of Arduino IDE. **[6]**

OR

Q4) a) Describe construction and working of shaded pole Induction motor with the help of suitable sketches and state its any two applications in practice. **[6]**

b) Draw the block diagram of Data Acquisition system and briefly explain the function of each block. **[6]**

Q5) a) Explain the following functions along with their syntax.

i) Serial. print ( )

ii) Serial . print ln ( )

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

b) Draw a neat sketch showing the interfacing of Atmega 328P based Arduino board with 16 × 2 Liquid crystal display (LCD) and write algorithmic steps to continuously blink the message written on the display on two rows with a delay of 1 second. **[6]**

OR

Q6) a) Explain the following functions used to handle GPIO in ATmega 328P based Arduino board with the help of syntax. **[6]**

i) Pin Mode ( )

ii) Digital Read ( )

iii) Digital Write ( )

b) It is desired to blink three LEDs simultaneously for ON/OFF period of 10 msec. The LEDs are connected to digital pins 3, 5 and 7 of port B of ATmega 328P based Arduino board. Draw the interfacing diagram and write the algorithmic steps to execute program. **[6]**

Q7) a) Explain the principle of operation of LVDT and draw the interfacing diagram of LVDT with Arduino board. **[6]**

b) Explain the following characteristics of analog to digital converters (ADC) briefly and specify these in case of ADC in ATmega 328P based Arduino board. **[7]**

i) Resolution

ii) Absolute accuracy

iii) Conversion time

iv) Data rate

OR

Q8) a) Explain the concept of Pulse Width modulation (PWM). Draw the interfacing circuit showing DC motor interface with Arduino. **[6]**

b) What is LM 35? How can LM 35 be interfaced with ATmega 328P based Arduino board? Draw relevant interfacing diagram. **[7]**