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[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