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[4957]-1020

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

(II Sem.) EXAMINATION, 2016

ELECTRONICS AND ELECTRICAL ENGINEERING

(2012 PATTERN)

Time : Two Hours

Maximum Marks : 50

- N.B. :—**
- (i) Answer 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) State the following about each register in the register set of 8051 microcontroller : [6]
- (i) Size and
 - (ii) Function.
- (b) What is serial communication ? Explain the interfacing of 8051 microcontroller to PC. [6]

Or

2. (a) Explain addressing modes of 8051 microcontroller with the help of one example each. [6]
- (b) What is function of TCON register ? Mention significance of each bit of TCON. [6]

P.T.O.

3. (a) A 6-pole, 50 Hz, 3-phase induction motor running at full load with 4% slip develops a torque of 149.3 N-m at the shaft. The friction and windage losses are 200 W and the stator copper and iron losses amounts to 1620 W. Calculate :
- (i) output power
 - (ii) rotor copper loss and
 - (iii) efficiency at full load. [6]
- (b) State methods of speed control of DC shunt and series motors. Explain any *two* methods in each case. [7]

Or

4. (a) A 220 V DC series motor takes 40 A while running at 700 rpm. Calculate current taken from supply and the speed at which the motor will run if the field is shunted by a resistance equal to the field resistance and the load torque is increased by 50%. Given : armature resistance is 0.15 Ohm, field resistance is 0.1 Ohm, flux per pole is proportional to the field current prior to magnetic saturation. [6]
- (b) Discuss the torque-slip characteristics of three phase induction motor. Explain the effect of change in rotor resistance on this characteristic curve. [7]

5. (a) Explain measurement of voltage, current and frequency of small signals using cathode ray oscilloscope. [6]
- (b) What are advantages of digital voltmeters over analog voltmeters ? State limitations of digital voltmeters. [6]

Or

6. (a) Explain working of cathode ray oscilloscope with the help of block diagram. [6]
- (b) Discuss working of frequency counter with the help of neat diagram. [6]

7. (a) What is the principle of operation of electrostatic instruments ? State their merits and demerits. [6]

- (b) A 7.46 kW induction motor runs from a 3-phase, 400 V supply. The motor takes a line current of 4 A at a power factor of 0.208 lagging on no load condition. This motor operates at a power factor of 0.88 lagging and an efficiency of 89% while delivering full load. Determine the readings on each of the two wattmeters connected to measure the total power on :
- [6]

- (i) no load and
- (ii) full load.

Or

8. (a) Explain the working of Maxwell's Inductance Bridge for measurement of unknown inductance. [6]
- (b) Discuss two wattmeter method for measuring active and reactive power in three phase balanced load with the help of connection diagram and phasor diagram. [7]

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