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[5252]-120

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

(Second Semester) EXAMINATION, 2017

ELECTRONICS AND ELECTRICAL ENGINEERING

(2012 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :— (i) Answer Questions 1 or 2, 3 or 4, 5 or 6, 7 or 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) Draw the block diagram of 8051 microcontroller to showcase its architecture. [6]

(b) Explain the special function registers of 8051 microcontroller in brief. [6]

Or

2. (a) Explain parallel data transfer scheme in detail. [6]

(b) Draw and explain the serial interface of 8051 microcontroller with computer. [6]

3. (a) Explain any *two* types of starters for three phase induction motor. [6]

P.T.O.

- (b) A 250 V, 4 pole lap wound DC shunt motor takes no-load current of 4 A when running at 1200 r.p.m. The resistance of armature winding is $0.1\ \Omega$ and shunt field winding is $125\ \Omega$. The brush drop is 2 V. If it takes current of 61 A on full-load, calculate its full load speed. Assume that flux gets weakened by 5% on full-load condition due to armature reaction.

[7]

Or

4. (a) Explain the necessity of starter for DC motor. Draw and explain three-point starter. [6]
- (b) A 3-phase, 4-pole, 50 Hz induction motor is supplied by 400 V supply. Its full load slip is 4%. At full load, stator copper losses are same as rotor copper losses. Stator iron losses are 25% of stator copper losses. Neglecting rotor iron losses, mechanical losses are one-third of no load losses. Full load output is 50 HP. Calculate the efficiency on full load. [7]
5. (a) Write difference between analog and digital instruments. [6]
- (b) With the help of neat diagram explain digital frequency counter. [6]

Or

6. (a) Explain working of digital multimeter with the help of block diagram. [6]

- (b) Explain audio oscillators with the help of diagram. [6]
7. (a) Explain two wattmeter method for measuring three-phase power with the help of neat circuit diagram and phasor diagram. Explain effect of power factor on wattmeter readings. [7]
- (b) Explain Wien's bridge for frequency measurement. [6]

Or

8. (a) Explain Maxwell's Induction-Capacitance bridge with neat diagram [7]
- (b) Three coils each having resistance of $10\ \Omega$ and inductance of $0.02\ \text{H}$ are connected in star across $440\ \text{V}$, $50\ \text{Hz}$ supply. If two wattmeters are connected to measure power, determine (1) phase voltage (2) line current (3) reading of both wattmeters. [6]