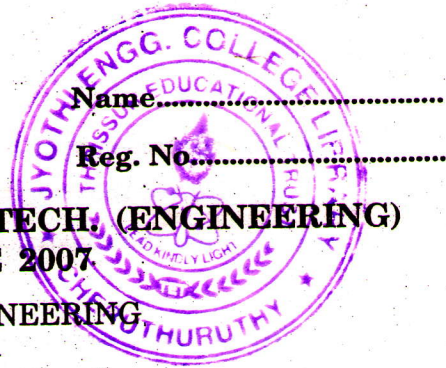


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Name.....

Reg. No.....

**COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)
DEGREE EXAMINATION, JUNE 2007**

ME 04 108—BASIC ELECTRICAL ENGINEERING

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

- I. (a) Explain what is meant by linearity.
(b) Explain what is meant by damping torque.
(c) Explain the concepts of conductance and susceptance.
(d) What is meant by balanced three phase system ? Explain.
(e) Explain the principles of operation of step-down and step-up transformer.
(f) Discuss about autotransformer.
(g) Calculate the e.m.f. generated by a 4-pole wave-wound armature having 45 slots with 18 conductors per slot when driven at 1200 r.p.m. The flux per pole is 0.016 Wb.
(h) Explain the characteristics of series motors.

(8 × 5 = 40 marks)

Part B

- II. (a) Define and explain the following terms :—

- | | |
|-------------------|---------------------|
| (i) Permeability. | (ii) Magnetic flux. |
| (iii) m.m.f. | (iv) reluctance. |

Or

- (b) (i) Explain moving coil instruments for electrical measurements. (8 marks)
(ii) Explain eddy current losses in ferromagnetic materials. (7 marks)

- III. (a) (i) Derive an expression for resonant frequency of parallel resonant circuit. (8 marks)
(ii) A series RLC circuit has a Q of 80 and a bandwidth of 160 Hz. Calculate the resonant frequency and the two half-power frequencies. (7 marks)

Or

- (b) (i) Explain voltages and currents in star and delta connections. (8 marks)
(ii) Compare single and 3-phase supply systems. (7 marks)

- IV. (a) (i) Explain the theory of an ideal transformer. (7 marks)
(ii) Explain open circuit test of a single phase transformer. (8 marks)

Or

Turn over

- (b) (i) Explain copper loss in a transformer. (7 marks)
- (ii) Derive the condition for maximum efficiency of a transformer. (8 marks)
- V. (a) Explain the construction and working principle of a simple d.c. generator. (15 marks)

Or

- (b) (i) A 250-V series motor has an armature resistance of 0.08Ω and field resistance of 0.02Ω and produces full load torque when running at 500 r.p.m. taking a current of 40 A. Calculate (1) armature current ; (2) the speed when producing half full-load torque. Neglect effect of armature reaction and saturation.

(8 marks)

- (ii) Compare shunt and series motors.

(7 marks)

[4 × 15 = 60 marks]