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2007 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

II B.TECH I SEMESTER REGULAR EXAMINATIONS
ELECTRICAL AND ELECTRONICS ENGINEERING
(AUTOMOBILEENGINEERING)

SET NO -4
NOVEMBER 2007

Time: 3 hours
Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. 1. (a) Explain active and passive elements.

(b) Explain practical voltage source and practical current source.

(c) Determine the current I in the circuit . All resistances are in ohms. *[3+3+10]*

2. (a) Write down the similarities and dissimilarities between motors and generators.

(b) A d.c. machine develops an open circuit e.m.f of 250V at 1500rpm. Find the developed torque for an armature current of 20 A. *[8+8]*

3. (a) Derive the EMF equation of a single Phase Transformer.

(b) The maximum flux density in the core of 240/2400 volts, 50 Hz single Phase Transformer is 1.0 weber/sq.m.If the EMF per turn is 8 volts, determine

i. The primary and secondary turns and
ii. Area of core *[8+8]*

4. (a) A 4 pole synchronous generator runs at 1500 RPM. What is the frequency of Emf induced in the alternator. If the number of poles are doubled what will be the Frequency of Emf induced at the above speed?

(b) Discuss the constructional features of the rotor of a
i. Slip ring type and
ii. Squirrel cage type of 3 phase induction motors. *[6+10]*

5. (a) Explain with a neat sketch the constructional details of a permanent magnet moving Coil instrument.

(b) Derive the expression for deflecting torque in the above type of instruments. *[6+10]*

6. (a) Define rectifier efficiency? Find the maximum value of it for Full wave rectifier?

(b) The primary voltage on transformer in center tap full wave rectifier is 120Vrms, 50 Hz and N1: (N2/2) is 15:1. Diode voltage drops are 0.7 V.
i. What should be the value of RL if the average current in Rl must be 0.5A?
ii. What power is dissipated in RL ?
iii. What minimum piv rating is required for the diodes ?
iv. What is the output frequency? *[8+8]*

7. (a) Explain why is collector wider than emitter and base?
(b) Why collector current is slightly less than emitter current?
(c) Calculate IE in a transistor for which ß = 50 and IB = 20 µA. [6+6+4]

8. (a) A cathode ray tube has X-plates defection sensitivity of 0.5mm/v. An alter-nating voltage of 40sin2 p×50t volts is applied to X-plates. What trace will you observe on the screen? Give the dimensions of the trace.

(b) Derive an approximate expression giving the deflection produced by a long deflection coil in a CRO. Coil runs for the entire length from the final anode to the screen