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2007 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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

SET NO -3  
NOVEMBER 2007

Time: 3 hours  
Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

- 1.(a) What are the different types of elements that constitute an electric circuit?  
(b) Find the current through the 10 resistor in the circuit Also, calculate total current? [6+10]
2. (a) What are the different types of d.c. generators according to the way in which fields are excited? Show the connection diagram of each type?  
(b) A 4 pole wave wound armature has 720 conductors and is rotated at 1000revolution per minute. If the useful flux is 20 mwb, calculate the generated voltage. [10+6]
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) Discuss in detail, the Pre determination of voltage regulation of an alternator from the open circuit and short circuit test data.  
(b) A 120 KVA , 3,000 V , single Phase alternator has the following armature parameters. Resistance = 0.5 Synchronous Reactance =10  
(c) Calculate the % Voltage regulation at full load  
i. 0.8 pf lag  
ii. 0.9 pf lead  
iii. unity pf
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) Why are diodes not operated in the breakdown region in rectifier service?  
(b) Why is capacitor filter is preferred than inductor filter in rectifiers?

(c) What are the limitations of center tap transformer in full wave rectifier?

[4+6+6]

7. (a) Why the transistor named as Bipolar Junction type transistor?

(b) Draw and explain the circuit of biasing the npn transistor.

(c) The emitter current in a certain npn transistor is 8.4mA. If 0.8% of the minority carriers injected into the base recombine with holes and the leakage current is  $0.1\mu\text{A}$ , Find

i. the base current

ii. the collector current

iii. the exact value of  $\alpha$  and

iv. the approximate value of  $\alpha$ , neglecting ICBO.

[4+4+8]

8. (a) How is the electron beam focused to a fine spot on the face of the cathode ray tube?

(b) Why is an attenuator probe used for measurements with oscilloscope?

(c) What is delayed sweep? Why it is used in oscilloscopes?

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