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Total No. of Questions: 09] **[Total No. of Pages: 02**

B. Tech. (Sem. – 1st)
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
SUBJECT CODE: BTEE - 101 (2011 Batch)
Paper ID: [A1104]

Time: 03 Hours **Maximum Marks: 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Five** questions from Section - B & C.
3) Selecting at least **Two** from each section - B & C.

Section - A ***(2 Marks each)***

Q1) a) Apply Mesh Analysis to circuit shown in fig. 1 to find the power consumption by 3 ohm resistance.

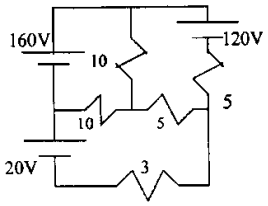

Fig. 1

b) A voltage $v(t) = 170 \sin(377t + 10^o)$ is applied to a RL series circuit with R = 2 ohm and L = 2.5mH. Determine the variation of instantaneous power. Also find the average power delivered to circuit and power factor.

c) What is a thermistor? Give its two applications.

d) What is the difference between crustal diode and zener diode?

e) Do the following operations:
$(101010011.1101)_2 + (11010111.101)_2 = (\_\_\_\_\_)_2$
$(1684)_{16} - (4AE)_{16} = (\_\_\_\_\_)_{16}$
$(367)_8 * (12)_8 = (\_\_\_\_\_)_8$
$(10101011.011)_2 = (\_\_\_\_\_)_{16}$

f) What are advantages of three phase circuit over single phase circuit?

g) Draw the schematic of D type flip flop using universal logic gates?

h) What are different types of DC motors? Give an application of each type?

i) Name the machine used for major industrial applications where controllable speed is required?

j) Define current gain of common emitter configuration of bipolar junction transistor. What is the approximate range of current gain?

Section - B *(8 Marks each)*

Q2) A mild steel ring having a cross sectional area of 500mm^2 and a mean circumference of 400mm has a coil of 200 turns wound uniformly around it. Calculate: (i) the reluctance of the ring (ii) the current required to produce a flux of 800μ Wb in the ring. Permeability of ring material = 3000

Q3) Sketch the labeled constructional diagram of Transformer. Clearly mention the material used for each of the part.

Q4) Show that for delta connections of three phase circuit, the line voltage is equal to the phase voltage whereas line current is equal to 1.732 times phase current. Also draw phasor diagram to support your answer.

Q5) What is series resonance of an RLC circuit? Show that the operating power factor of circuit is unity and maximum current flows through the circuit under resonance. Sketch impedance variation with frequency of an RLC circuit.

Section - C *(8 Marks each)*

Q6) What is digital multi-meter? What is its operating principle? What are the quantities that can be measured by this meter?

Q7) Discuss the operation of mid point configuration of full wave rectifier feeding resistive load. Obtain the average value and rms value of output voltage. Sketch the waveforms of load voltage, voltage across one diode?

Q8) Discuss operation of bipolar junction transistor. Discuss its input and output characteristics. What parameters can be obtained from these characteristics?

Q9) Draw schematic of JK Flip flop and T type flip flop. Write their truth tables. Under what conditions JK flip flop is better than SR flip flop.

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