Roll No _____ **Examination May-2014** Total no of page-2

B. Tech.

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

BTEE-101

Paper ID-A1104

Time allowed: 3.00 hrs. **Max Marks: 60**

Note: (i) Question no. 1 is Compulsory.

(ii) Attempt five questions from part A and part B with at least two questions each from part A and part B.

(iii) Assume missing data if any and clearly indicate it.

Q1 (a) A coil of Stranded copper wire having a resistance of 12Ω at 25^0C is embedded in the core of a large transformer supplied at 230V. After the transformer has been in service for several hours, the resistance of the coil is found to be 13.4 ohms, What is the temperature of the core? Also find power rating of the resistance. Assume temperature coeffient of wise as 0.00125/^{0}C **(10*2=20)**

(b) A series RL circuit with R= 30 ohm and L= 15H is supplied from a constant voltage source of 60V and is switched on at t= 0. Determine the current in the circuit, voltage across resistor and voltage across inductor.

(c) A voltage $v(t) = 170 \sin(377t+10^0)$ is applied to a circuit. It causes a steady state current to flow which is described by $i(t) = 14.14 \sin(377t - 20^0)$. Determine the variation of instantaneous power, Also find the average power delivered to circuit and power factor.

(d) What is full form of LVDT? Give its two applications.

(e) Sketch circuit symbol of PNP transistor, Zener Diode, Field effect Transistor, Crystal diode.

(f) Do the following conversions:
$(101010011.1101)_2$ to $(-------)_8$
$(1684)_{16}$ to $(------)_2$

(g) Draw the schematic of JK flip flop using universal logic gates.

(h) What are two different types of three phase induction motors? Give an application of each type.

(i) Name the machine used at major power generating stations in India.

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

Part – A

Q2 Determine the current delivered by the source in the circuit shown in fig. 1 **(8)**

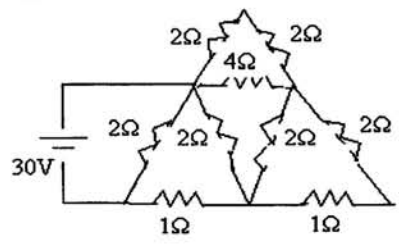

Fig. 1

Q3 Show that emf induced in transformer winding is proportional to flux present in core, number of turns and frequency of source applied. **(8)**

PTO

Q4 Sketch the labeled constructional diagram of DC generator. Clearly mention the material used for each of the part. (8)

Q5 Show that for star connections of three phase circuit, the line voltage is equal to 1.732 times the phase voltage whereas line current is equal to phase current. Also draw phasor diagram to support your answer.

Part-B

Q6 What is strain gauge? What is its operating principle? (8)

Q7 Discuss the operation of bridge 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. (8)

Q8 Draw functional diagram of regulated power supply. What are the considerations of regulated power supply? Give its applications. (8)

Q9 Draw schematic of SR Flip flop and D type flip flop. Write their truth tables. Under what conditions SR flip flop is unstable. (8)

End