KERALA AGRICULTURAL UNIVERSITY

B.Tech (Food Engg.) 2011 Admission

II[nd] Semester Final Examination, July/August 2012

Cat. No Elen.1201 **Marks: 80**

Title: Basic Electrical Engineering (2+1) **Time: 3hours**

I. Answer All Questions (10x1=10)

Fill in the blanks

1. Resistance of a conductor 20m long and 2mm^2 in cross section is 0.346Ω. Its specific resistance is .....
2. In a series RL circuit, the current..... the voltage.
3. In the expression for three phase power ($\sqrt{3}V_L I_L \cos\phi$), ϕ is the angle between .....voltage and .....current.
4. At room temperature, the barrier potential for silicon is.....
5. Hexadecimal system uses a base of.....

State True or False

6. Kirchoff's current law is applicable to only closed loops in a network.
7. Emitter of a transistor is generally doped the heaviest.
8. AND gate implements logic addition.

Define

9. RMS quantity in an AC circuit.
10. Power factor.

II. Answer <u>ANY TEN</u> (10x3=30)

1. State kirchoff's voltage and current laws.
2. Differentiate between self and mutual law of electromagnetic induction.
3. Explain star and delta connection in three phase AC circuits.
4. Explain briefly the accessories used for wiring.
5. Explain a method of power measurement in three phase AC circuit.
6. Derive average value of AC signal.
7. Write short notes on passive components in electronic circuit.
8. What you meant by ripple factor and regulation based on rectifier circuits.
9. Explain the theory of operation of PNP transistor.
10. Write short notes on FET.
11. Why NOR gate and NAND gate are called universal gates.
12. Implement the Boolean expression $\overline{(A+B)(C+D)}$ using logic gates.

III **Answer <u>ANY SIX</u> of the following.** (6x5=30)

1. Explain Superposition theorem. Find the current in resistor R in Fig. 1 using superposition theorem.

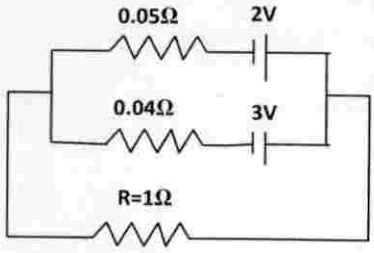

Fig. 1

2. Explain about load estimation in the processing industry.
3. State and prove thevenin's theorem with one example.
4. Explain different types of heaters.
5. Distinguish between extrinsic and intrinsic semiconductors.
6. Explain the operation of zener diodes.
7. Explain any one type of transistor configuration with its charecteristics.
8. State and prove DeMorgan's theorems.

IV **Answer <u>ANY ONE</u> of the following** (10x1=10)

1. a) Draw the phasor diagram of RLC series circuit. Derive equation for impedance and current.

   b) A non-inductive resistor takes 8 A at 100V. Calculate the inductance of a coil of negligible resistance to be connected in series. This series connection is supplied from 220V, 50Hz mains. What will be the phase angle between the supply voltage and current?

2. Explain the operation of Half wave and Full wave rectifier circuits with neat circuit diagram and waveforms. Explain why capacitor filters are used with these circuits?