B.Tech. Degree I& II Semester (Combined) Examination June 2014

IT/CS/CE/SE/ME/EE/EB/EC/EI/FT 1107 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(2012 Scheme)

Time : 3 Hours   Maximum Marks : 100

SECTION A – ELECTRICAL ENGINEERING

### PART A
(Answer ALL questions)

(4 × 5 = 20)

I   (a)   Explain (i) Circuit breakers   (ii) GFCI   (iii) Fuses
    (b)   State and explain Kirchhoff's laws for an electric circuit.
    (c)   Define RMS and average value of a waveform. What do you mean by form factor?
    (d)   Distinguish between star and delta connection in three phase circuits.

PART B

(2 × 15 = 30)
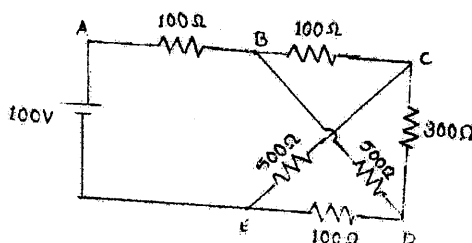
II.   (a)   Explain resistor color coding.   (5)
      (b)   Find the effective resistance and current through each resistance.   (10)
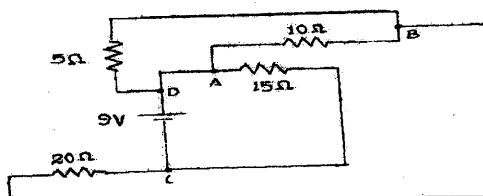
OR

III.   (a)   Derive capacitance equation   (5)
       (b)   Determine the current supplied by the battery in the given circuit by using Kirchhoff's   (10)
             law. Also find out the current through 300Ω resistance.

IV.   (a)   With the aid of a Phasor diagram obtain the relationship between the line and phase   (7)
            values of voltage and current in a three phase star connected system.
      (b)   Two impedances $z_1 = 6 - j8$ ohms and $z_2 = 16 + j12$ ohms are connected in parallel.   (8)
            If the total current of the combination is $(20 + j10)$ amperes, find the branch currents.

OR

V.   (a)   Explain the working principle of an energy meter with a neat diagram.   (6)
     (b)   Write short notes on hydro electric power station. Explain with figure.   (9)

(P.T.O.)

SECTION B – ELECTRONICS ENGINEERING

PART A
(Answer *ALL* questions)

(4 x 5 = 20)

VI.   (a)   What is the working principle of varactor diode? Give one application?

      (b)   Explain the operation of transistor as a switch.

      (c)   What is frequency modulation? Explain with relevant waveforms.

      (d)   What is the concept of frequency reuse in mobile communication?

PART B

(2 × 15 = 30)

VII.   (a)   Explain the working of a bridge rectifier with a neat circuit diagram. Also derive the   (10) equations for rms value of current and ripple factor. What PIV rating is required for diodes in a bridge rectifier that produces a peak o/p voltage of 50V?

      (b)   Explain the working principle of capacitor filter.   (5)

OR

VIII.   (a)   Explain how a zener diode can be used as voltage regulator. Define line regulation   (6) and load regulation.

      (b)   Draw the common emitter configuration of a transistor and explain its operation.   (9) Sketch i/p and o/p characteristics and show how dynamic resistance and current gain is calculated.

IX.   (a)   Explain the working principle of CRO with the help of block diagram.   (10)

      (b)   Give one example of a force sensor and explain its working.   (5)

OR

X.   Explain satellite communication with the help of block diagram.   (15)

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