B. Tech. Degree I & II Semester (Combined) Examination June 2013

IT/CS/EC/CE/ME/SE/EE/EI/EB/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 x 5 = 20)

I.   (a)   Determine the potential difference to be applied across a conductor of resistance 12Ω, so that a current of 15A may flow through it.

       (b)   A coil consists of 2000 turns of copper wire having a cross sectional area of 0.8 mm^2. The mean length per turn is 80cm, and the resistivity of copper is 0.02 $\mu\Omega m$. Find the resistance of the coil.

       (c)   Explain the working principle of transformer.

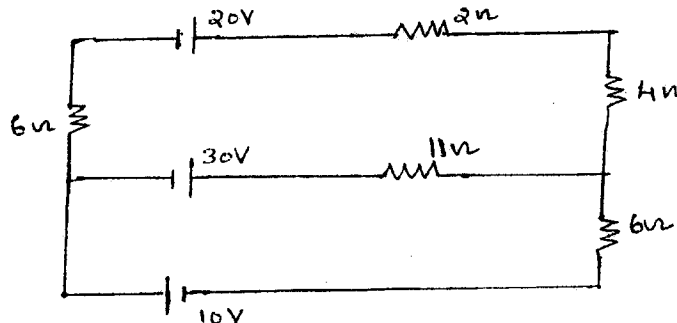   (d)   Find the form factor for half wave rectified alternating current.

PART B

(2 x 15 = 30)

II.   (a)   Explain voltage division rule for series circuit..   (5)

       (b)   Calculate the current through 'R' in the network   (10)
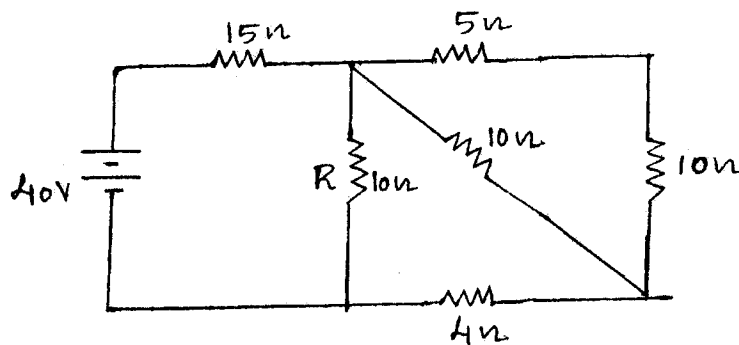
OR

III.   (a)   For the circuit shown find the direction and value of current flowing in each of the batteries.   (9)

       (b)   Explain the following terms: (6)
             (i) Resisitivity (ii) Power (iii) Inductance

IV. (a) Draw the layout of a thermal power plant and explain. (10)

(b) A 10Ω resistor and $400\mu F$ capacitor are connected in series to a 60 V sinusoidal supply. (5) The circuit current is 5A. Calculate the supply frequency and phase angle between the current and voltage.

OR

V. (a) A choke coil takes a current of 2A lagging 60° behind the applied voltage of 200V at 50Hz. (7) Calculate the inductance, resistance and impedance of the coil. Also, determine the power consumed when it is connected across 100V, 25 Hz supply.

(b) Explain the working principle of energymeter. (8)

SECTION B: ELECTRONICS ENGINEERING

PART A
(Answer *ALL* questions)

(4 x 5 = 20)

VI. (a) Explain the VI characteristics of PN junction diode.

(b) What are photodiodes? What are its applications?

(c) Explain the bandwidth and information capacity of a communication system.

(d) Explain frequency reuse in cellular telephone system.

PART B

(2 x 15 = 30)

VII. (a) Briefly explain the advantages of full wave rectifier over half wave rectifier. (5)

(b) Explain the operation of transistor as amplifier in CE configuration. (10)

OR

VIII. (a) Explain the operation of zener diode as voltage regulator with the help of VI characteristics. (5)

(b) Discuss the operation of a centre tap full wave rectifier with the help of waveforms. (10) Determine its ripple factor.

IX. (a) Enumerate any one application for each of the following sensors: (6)

(i) temperature (ii) light (iii) force (iv) sound

(b) Briefly explain the principles of amplitude moderation and angle modulation. (9)

OR

X. (a) What is the need for modulation in communication systems? (5)

(b) Explain an optical fibre communication system using block diagram. (10)

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