(Pages : 4) **1807**

Reg. No. : .....

Name : .....

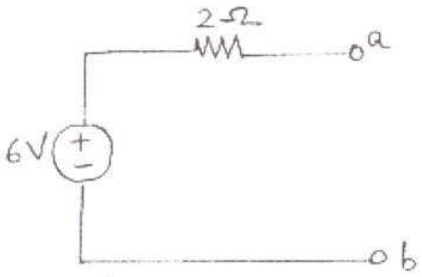
Combined First and Second Semester B.Tech. Degree Examination, April 2014
(2013 Scheme)
13.108 : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (FR)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. Explain Kirchoff's law.
2. Convert the given voltage source circuit to current source circuit.



3. State and explain Reciprocity theorem.
4. Define the bandwidth of a series resonant circuit.
5. If the current through a coil having an inductance of 0.5H is reduced from 5A to 2A in 0.05s, calculate the mean value of emf induced in the coil.
6. Three resistor 10Ω , 20Ω and 25Ω are connected in star. Find their equivalent delta circuit.
7. Plot the VI characteristics of a zener diode.
8. Obtain the relationship between α and β of a transistor.
9. Explain briefly about the losses in a transformer.
10. Draw the block diagram of SMPS. **(2×10=20 Marks)**

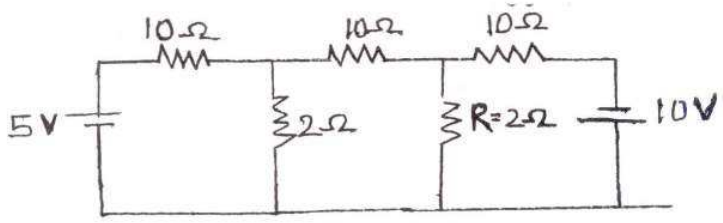
P.T.O.

PART – B

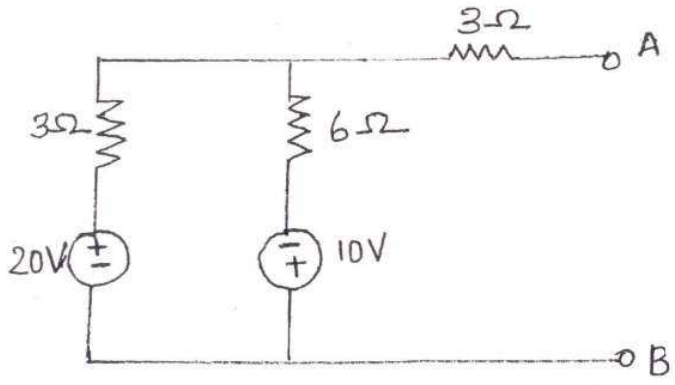
Answer **one full** question from **each** Module.

Module – I

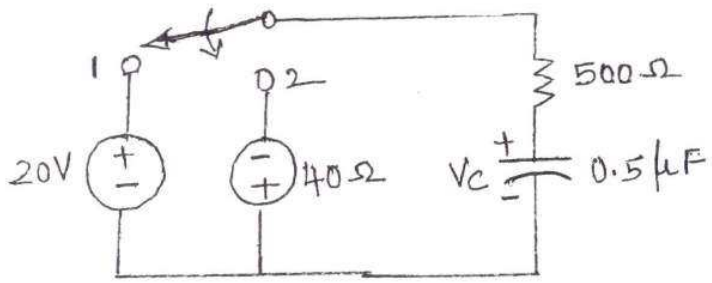
11. a) Find the voltage aross resistor R, in the network by mesh analysis. **10**



b) Obtain the thevenin and Norton equivalent circuit for the active network given below in figure **10**



12. a) The switch in the circuit is closed one position 1 at t = 0 and moved to position 2 after 1 time constant, at t = τ = 250 μ s. Find the expression for current at t > 0 and plot the current wave form. **10**



b) A series RLC circuit has R = 2Ω and C = 200μ F. Applied voltage = 10 v at a frequency of 1000 rad/sec. The inductance is varied so that circuit is in resonance.

Find the value of

1) inductance at resonance

2) quality factor and

3) bandwidth. 10

Module – II

13. a) Explain the following terms with respect to magnetic circuit.

1) mmf

2) flux density

3) field strength

4) reluctance. 10

b) A circular iron ring of mean diameter 25 cm and cross sectional area 9 cm^2 is wound with a coil of 100 turns and carries a current of 1.5 A. The relative permeability of iron is 200. Calculate the amount of flux produced in the ring. 6

c) Express the admittance of the circuit having the following impedances in rectangular notation

a) $(3 + j5)\Omega$

b) $20\angle -30^\circ$ 4

14. a) Explain the following terms w.r.t. a waveform

1) RMS value

2) Average value

3) Form factor. 8

b) Draw the block diagram of a CRO. 5

c) Explain the working principle of a moving coil ammeter. 7

Module – III

15. a) Derive the emf equation of a transformer. 5

    b) A 125 kVA transformer having primary voltage of 2000 V at 50 Hz has 182 primary and 40 secondary turns. Neglecting losses calculate

    1) full load primary and secondary current

    2) no load secondary emf. 5

    c) Explain the working of a single phase induction motor. What are the different methods for starting single phase induction motor ? Explain any one method. 10

16. a) Explain the necessity of earthing. Explain any one method of earthing with the help of a neat diagram. 10

    b) Explain the working of ELCB with the help of a neat circuit. 10

Module – IV

17. a) With the help of a neat diagram explain the working of a half wave rectifier. Also plot the input and output waveform. 10

    b) Compare the three different configuration of bipolar junction transistor. 10

18. a) Explain the following :

    a) SCR

    b) Photodiode

    c) Solar cell

    d) LED 10

    b) Explain the construction and working of an n-channel. JFET using a neat diagram. 10
