



Reg. No. :

Name :

**Combined First and Second Semester B.Tech. Degree
Examination, April 2014
(2013 Scheme)**

13.108 : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (FR)

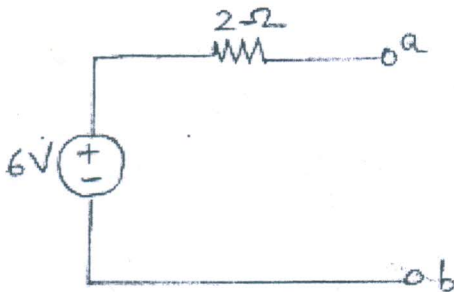
Time : 3 Hours

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 $10\ \Omega$, $20\ \Omega$ and $25\ \Omega$ 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.

(2x10=20 Marks)



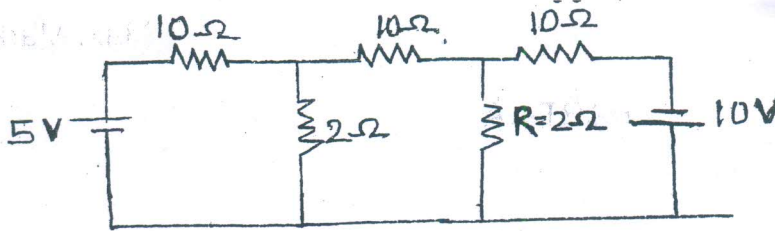
PART - B

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

Module - I

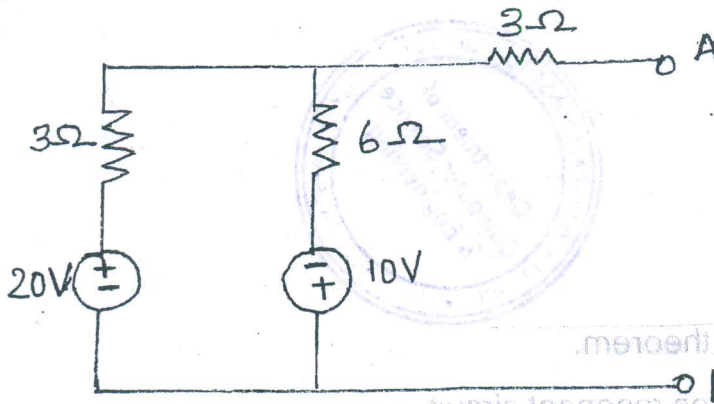
11. a) Find the voltage across resistor R , in the network by mesh analysis.

10



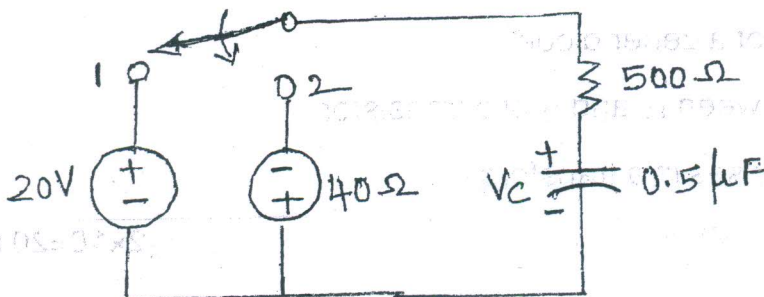
b) Obtain the thevenin and Norton equivalent circuit for the active network given below in figure

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 $t = \tau = 250 \mu\text{s}$. Find the expression for current at $t > 0$ and plot the current wave form.

10

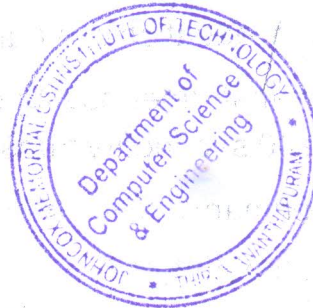




b) A series RLC circuit has $R = 2\Omega$ and $C = 200\mu F$. Applied voltage = 10 v at a frequency of 1000 rad/sec. The inductance is varied so that circuit is in resonance.

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