3-1-110

SUBJECT: ELECTRONICS

SEMESTER-I

Paper- I : BASIC CIRCUIT THEORY

UNIT I

A.C CIRCUIT FUNDAMENTALS

The sinusoidal voltage and current-Average and R.M.S values- phasor representation-_j' operator, polar and rectangular forms of complex numbers, A.C applied to RC, RL and RLC circuits -phasor diagrams-concept of impedance-power factor in a.c circuits, numerical problems.

PASSIVE NETWORKS

Concept of ideal as well as practical voltage and current sources, Regulation Kirchhoff's current law - Kirchhoff's voltage law - Method of solving A.C and D.C circuits by Kirchhoff's laws

Loop analysis - Nodal analysis - numerical problems.

UNIT II

NETWORK THEOREMS

Maximum power transfer theorem -Super position theorem - Thevenin's theorem - Norton's theorem - Thevenising a circuit-Thevenin Norton conversion -Milliman theorem-Reciprocity theorem- problem solving applications for all the theorems.

UNIT III

RC and RL CIRCUITS

Transient response of RL and RC circuits with step input, Time constants, Frequency response of RC and RL circuits, their action as low pass and high pass filtersPassive differentiating and integrating circuits ,numerical problems.

UNIT IV

RESONANCE IN ELECTRIC CIRCUITS

Resonance in series and parallel R- L- C circuits ,Resonant frequency, Q-factor, bandwidth, selectivity. Comparision of series and parallel resonance .Tank circuit-LC oscillations, numerical problems.

UNIT V

CATHODE RAY OSCILLOSCOPE

CRT and its working ,Electron gun, electrostatic and magnetostatic deflections. Deflection sensitivity, Fluoscent screen, CRO block diagram, Measurement of voltage, frequency and phase, Function generator-Block diagram and its description.

Signature of the Chairman (B.O.S.) (20.....Exams)

TEXT BOOKS:

1.Electric circuits by David A.Bell 7TH edition Oxford higher education

2. Robert L Boylestad, —Introductory circuit analysisl,Universal BookStall Fifth edition,2003

3.Circuit analysis byP.Gnanasivam-Pearson education

4.Networks,lines&fields by Ryder-PHI

5.Circuits and Networks-A.Sudhakar and Shyam mohan-TMH

PRACTICALS - 1

(At least Seven experiments should be done)

1. Measurement of D.C&A.C voltage , frequency using CRO.
2. Thevenin's theorem - Verification.
3. Norton's theorem - Verification.
4. Maximum power transfer theorem - Verification.
5. CR Circuits - Frequency response (Low pas and High pass)
6. LR Circuits - Frequency response (Low pas and High pass)
7. LCR Series resonance circuit - frequency response , Determination of Q and Band width
8. LCR parallel resonance circuit - frequency response , Determination of Q and Band width

LAB MANUAL

1. Zbar, Malvino and Miller, Basic Electronics, A Text Lab Manual, Tata McGraw Hill.

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Signature of the
Chairman (B.O.S.)
(20.....Exams)

3-1-110

MODEL PAPER

B.Sc (THREE YEAR) DEGREE EXAMINATIONS.

SEMESTER – I- ELECTRONICS

Paper - I:Basic Circuit theory

Time: 3Hrs Max. Marks:75

PART – A

Answer any FIVE questions 5X5= 25 Marks

1. Explain Polar & rectangular forms of Complex numbers.
2. Explain Node-voltage method for analyzing an electrical network.
3. State and prove Maximum power transfer theorem.
4. State and prove superposition theorem.
5. Discuss passive integrating and differentiating circuits.
6. Distinguish between series & parallel resonance circuits.
7. Explain transient response of RL circuit with time constant and step input.
8. Explain measurement of Voltage & frequency using a CRO.

PART – B

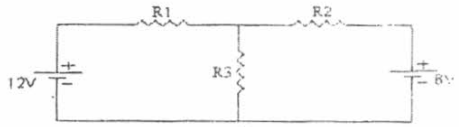
Answer ALL Questions 5X10=50 Marks

9. (A) Define and derive the relation for Average and RMS value of an ac voltage source.

or

(B) Explain loop current method. Determine the currents I_1,I_2 and I_3 for the Network shown below.[R1=8Ω, R2=6Ω, R3=2Ω]

Signature of the Chairman (B.O.S.) (20.....Exams)



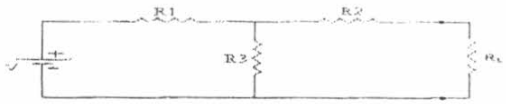
10. (A) State and prove Maximum power transfer theorem and Nortons theorem

or

(B) State and prove Thevenin's theorem and

Draw Thevenin's equivalent circuit to find the load current for the network shown below.

[V= 6Volts, R1= 2 Ω, R2=2 Ω, R3= 4Ω , R_L= 4Ω]



11. (A) Discuss the frequency response of C-R circuit as Low pass filter &High pass filter

or

(B) Explain the Transient Response of RC circuits with step input and time constant

12. (A) Define resonance and Q factor of a LCR series circuit. Obtain the resonance Frequency of a Series LCR circuit.

or

(B) Derive the resonant frequency of LCR parallel circuit and find the relation between bandwidth and resonance frequency.

13. (A) Explain the working of a Function generator using a block diagram. What is the Use of a Function generator?

or

(B) Give the block diagram of a CRO and explain the working of each block

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Signature of the Chairman (B.O.S.) (20.....Exams)