**ACHARYA NAGARJUNA UNIVERSITY :: NAGARJUNANAGAR-522 510**

**ELECTRONICS SYLLABUS (CBCS) SEMESTER-WISE**

# B.Sc. ELECTRONICS COURSE STRUCTURE

| Semester | Part | Subject | Hrs. | Credits | IA | ES | Total |
|---|---|---|---|---|---|---|---|
| **FIRST YEAR** | | | | | | | |
| Semester-I | Part-II | Basic Circuit Theory | 4 | 4 | 25 | 75 | 100 |
| | | Electronics Lab-I | 3 | 2 | 25 | 75 | 100 |

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**B.Sc. ELECTRONICS – SYLLABUS**
**SEMESTER-I**

**PAPER-1- BASIC CIRCUIT THEORY (60 Hours) (w.e.f. 2015-I6)**

**UNIT-I (14 hrs)**

**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 Kirchhoffs 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 (12 hrs) NETWORK THEOREMS**

Maximum power transfer theorem - Super position theorem – Thevenin's theorem – Norton's theorem – The venishing 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 filters Passive differentiating and integrating circuits, numerical problems.

**UNIT-IV (10 HRS) RESONANCE IS ELECTRIC CIRCUITS**

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

**UNIT-V (12 hrs) 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.

**TEXT BOOKS:**

1. Electronic circuits by David A.Hell 7$^{th}$ edition, Oxford higher education
2. Robert L Boylestad. "Introductory circuit analysis", Universal Book Stall Filth edition.2003.

2.A.P. Malvino, “Principles of Electronics”, TMH. 7th edition
3. T.F. Bogart, Beasley, “Electronic Devices and circuits”, Pearson Education. 6th Edition
4. T.N. Bhargava, D.C. Kulshreshta and S.C Gupta, ”Basic Electronics and Linear Electronics and Linear Circuits, TMH.
5. T L.FIoyd. “Electronic Devices and circuits”, PHI, fifth edition
6 V.K.Mehta, “Principle of Electronics”, S. CHAND Co. New edition
7 Godse A.P., Bakshi U.A (Ist edition). Electronics Devices. Technical Publications Pune.

**REFERENCE BOOKS**

1.Sedha, R.S. A Text Book of Applied Electronics, S. Chand & Company Ltd.
2 Jacob Millman and Christos C. Halkias (2008). Integrated Electronics, Tata McGraw-Hill
3.Robert L. Boylestad, Louis Nashelsky ($10^{th}$ edition). Electron Devices and circuit Theory. Dorling Kindersley (India Pvt. Ltd.)

**ELECTRONICS LAB - 2**
**(ELECTRONIC DEVICES & CIRCUITS LAB)**
**(All experiments should be done)**

1.V-I Characteristics of Junction Diode.
2 V-I Characteristics of Zener Diode.
3. Regulated Power Supply using Zener Diode.
4. IC Regulated Power Supply
5. BJT input and output Characteristics (CE Configuration) and determination of h-parameters
6 Characteristics of UJT.
7 Characteristics of JFET
8 LDR characteristics

**LAB MANUAL**

1. Zbar, Malvino and Miller, Basic Electronics. A Text Lab Manual. Tata McGraw Hill.
2. Sugaraj Samuel R., Horsley Solomon, B.E.S. Practicals.

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**MODEL PAPER**

**B.SC. (THREE YEAR) DEGREE EXAMINATIONS**

**SEMESTER-I, ELECTRONICS**

**Paper-I Basic Circuit Theory**

Time: 3 hrs Max. Marks: 75

**PART-A**

Answer any **FIVE** questions 5 X 5 = 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**

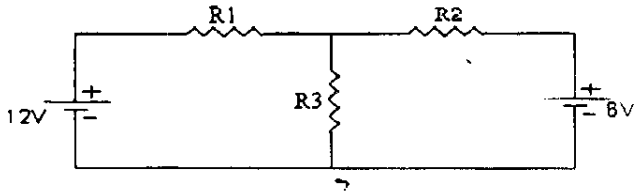
Answer ALL Questions 5 X 10 = 50 Marks

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 $l_1$, $l_2$ and $1_3$ for the

Network shown below.[R1=8Ω, R2=6Ω, R3=2Ω)



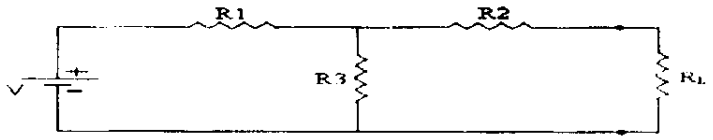

10. (A) State and prove Maximum power transfer theorem and Nortons theorem

or

(8) State and prove Thevenin's theorem and

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

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