Scheme of Examination

B. Sc. (Electronics) Semester I & II w.e.f. 2011-12

Semester-I

Paper No.	Title	Total Marks	Internal Assessment	Max. Marks
EL-101	Basic Electronics	50	10	40
EL-102	Network Theory	50	10	40
EL-103	Practical-I	50	--	50

Semester-II

Paper No.	Title	Total Marks	Internal Assessment	Max. Marks
EL-201	Electronic Devices and Circuits-I	50	10	40
EL-202	Digital Principles and Applications	50	10	40
EL-203	Practical-II	50	--	50

B.Sc. ELECTRONICS
Semester-I
Paper I- EL 101
Basic Electronics

Max. Marks : 40
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I
Classification of Solids on the basis of energy band diagram, conductors, Insulators, Semi-conductors, Types of semi-conductors, current in semi-conductors, ideal diode, V-I Characteristics of ideal diode, PN junction diode, Diasing of PN junction diode, junction-capicitance, Current in PN junction diode. Application of PN junction diode as a switch as rectifiers-Half wave rectifier, Full wave rectifier and bridge rectifier, Clamper and clipping circuits, Filter circuits, L,C, L-C, PIE section filters, Zener diode, Multiplier circuits.

Unit II

Bipolar Junction Transistor (BJT), Four regions of operation of BJT, Transistor current component, Transistor as an amplifier, BJT in CE, CB, CC configurations, I/P and O/P characteristics, I/P resistance, O/P resistance, Current gain, Voltage gain, Power gain.

Unit III
Transistor at low frequencies, Graphical analysis of CE configuration, Transistor hybrid model, conversion formulate for the parameters of the three transistor configuration.

References

1. Electronics for Scientist and Engineers by Vishwanathan, Mehta and Rajaraman (Prentic-Hall, India)
2. Electronics Fundamentals and Applications (5th addition) by John, D. Ryder (Prentice-Hall, India)
3. Introduction to Electronics by L.K.Brauson (Prentice-hall, India).
4. Digital Principles and Application by Malvine and Leach (Tata MC Graw hill)
5. Electronic Devices and Circuits by Motershed.
6. Electronic Devices and Circuit-Discrete and Integrated by Y.N. Bapat.
7. Semiconductor Electronics by A.K.Sharma (New Age Internationals Pvt. Ltd., India)

B.Sc. ELECTRONICS
Semester-I
Paper II- EL 102
Network Theory

Max. Marks : 40
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I
Ideal voltage source, Open circuit, voltage, Short circuit current, Thevenin's theorem, Norton's Theorems, Super Position Theorem, Reciprocity Theorem, Millman's Theorem, Equivalent network analysis using Kirchoff's laws by Node method and Loop method. Maximum Power Transfer Theorem.

Unit II
Sinusoidal Voltage applied across a combination of circuit elements, Low pass filter, High pass filter, Band pass and Band Rejection filters, step impulse and ramp functions, Differentiating and integrating circuits.

Unit III
Characterization of two ports, Impedence, Admittance and Hybrid parameters, Transformation of parameters, Dependent sources, Voltage and current amplifier, ideal transformer reciprocity, Impendence Convertor.

References

1. Electronics for Scientist and Engineers by Vishwanathan, Mehta and Rajaraman (Prentic-Hall, India)
2. Electronics Fundamentals and Applications (5th addition) by John, D. Ryder (Prentice-Hall, India)
3. Introduction to Electronics by L.K.Brauson (Prentice-hall, India).
4. Digital Principles and Application by Malvine and Leach (Tata MC Graw hill)
5. Electronic Devices and Circuits by Motershed.
6. Electronic Devices and Circuit-Discrete and Integrated by Y.N. Bapat.

Max. Marks : 50
Time : 3 Hrs.

Note for Practical papers:-
　　　　The practical examination will be of 3 hours.
　　　　Distribution of marks:
　　　　Experiments　　　　　　　　30 marks
　　　　Lab. Record　　　　　　　　8 marks
　　　　Viva-Voce　　　　　　　　　12 marks
The laboratory record will be assessed by both the external examiners. Distribution of marks of each experiment, Lab record and Viva-voce, oral examination, concerning the experiments in the syllabus are indicated above.
Use of simple (non-programmable) calculator is permissible.

1.　　Familiarization with CRO, Multi-meter, Bread board etc.
2.　　Measurement of time period, Voltage and phase shift using CRO
3.　　Electronic Volt-ohm meter, measurement of peak average and r.m.s. values of given signal, effect of wave form and signal frequency.
4.　　Junction transistor characteristics for Common Base configuration $V_e I_e$ and $V_E I_E$ and to calculate transistor parameters from graph.
5.　　Junction transistor parameter to measure common Emitter, h-parameter using various circuit arrangements.
6.　　Transistor amplifier configuration comparison of a Common Base Common Emitter and Common Corrector configuration of a given transistor.
7.　　Transistor bias stabilization, familiarization method for stabilization of transistor.
8.　　Study of half wave and full wave rectifier, Measurement of ripple factor.
9.　　Measurement of resistance, Using a multi-meter, Fabrication of potential divider circuit.

References

1.　　Experiments in electronics, by W.H. Events (Prentice-Hall, India)
2.　　Methods of Experimental Physics Vol.2, Electronic Method (Academic Press).

B.Sc. ELECTRONICS
Semester-II
Paper I- EL 201
Electronic Devices and Circuits-I

Max. Marks : 40
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I

Emitter follower, comparison of transistor amplifier configuration, Linear analysis of CE transistor amplifier configuration, Liner analysis of CE transistor circuit, Miller's Theorem, Cascading transistor amplifier.

Unit II

Transistor biasing and thermal stabilization, the operating point, stability, Self bias of emitter bias, stabilization against variations of ICE, VEB & Beta, Bias compensation, Thermal runway, Thermal stability.

Unit III

Junction Field Effect Transistor (JFET), Pinch off voltage, JFET V-I characteristics and transfer characteristics, FET small signal model, Low frequency common source and common drain amplifier, Biasing of FET, FET as voltage variable resister, MOSFET, depletion and Enhancement mode.

References:-
1. Semiconductor Electronics by A.K.Sharma (New Age Internationals Pvt. Ltd., India)
2. Electronic Devices and Circuits by Motershed
3. Electronic Devices and Circuit – Discrete and integrated by Y.N.Bapat
4. Electronics Fundamentals and Applications (5th Edition) by John D. Ryder (Prentice-Hall, India)

B.Sc. ELECTRONICS
Semester-II
Paper II- EL 202
Digital Principles and Applications

Max. Marks : 40
Internal Assessment : 10
Time : 3 Hrs.

NOTE :
1. The syllabus is divided into 3 units. Eight questions will be set up. At least two questions will be set from each unit and the student will have to attempt at least one question from each unit. A student has to attempt five question in all.
2. 20% numerical problems are to be set.
3. Use of Scientific (non-programmable) calculator is allowed.

Unit I
Binary numbers, Decimal to binary conversion, Binary to Decimal conversion, Binary addition, Subtraction, Multiplication, Division, 1's 2's, 9's, 10's compliments. 2's compliment addition and subtraction, Octal numbers octal to binary conversion, Vice-Versa, Hexa-Decimal number and conversion.

Unit II

BCD Code, 8-4-2-1, 2-5-2-1, excess three codes, Cyclic codes, Gray codes. Digital logic, +ve and –ve logic, Basic Logic gates – AND OR NOT gates, Boolean functions Duality Principle.
Unit III
Demorgans laws, Laws and theorems of Boolean Algebra, Precedence of Operators, Venn diagram, Truth table, Simplification of Boolean's function by Voolean algebra, K-map and its application (Four variables).

References

1. Electronics for Scientist and Engineers by Vishwanathan, Mehta and Rajaraman (Prentic-Hall, India)
2. Electronics Fundamentals and Applications (5th addition) by John, D. Ryder (Prentice-Hall, India)
3. Introduction to Electronics by L.K.Brauson (Prentice-hall, India).
4. Digital Principles and Application by Malvine and Leach (Tata MC Graw hill)
5. Electronic Devices and Circuits by Motershed.
6. Electronic Devices and Circuit-Discrete and Integrated by Y.N. Bapat.

B.Sc. ELECTRONICS
Semester-II
Paper III- EL 203
Practical-II

<div align="right">Max. Marks : 50
Time : 3 Hrs.</div>

Note for Practical papers:-

    The practical examination will be of 3 hours.

    Distribution of marks:

Experiments	30 marks
Lab. Record	8 marks
Viva-Voce	12 marks

The laboratory record will be assessed by both the external examiners. Distribution of marks of each experiment, Lab record and Viva-voce, oral examination, concerning the experiments in the syllabus are indicated above.

Use of simple (non-programmable) calculator is permissible.

1. Draw the characteristics of a PN Junction diode for various voltages.
2. Junction field effect transistor characteristic. T plot V and I characteristics of JFET.
3. To study the effect of R.C. Time constant when various driving voltages (Square, Triangular and rectifier sine wage) are applied across a series of RC Circuits.
4. To study the performance of a diode as clipper and sketch the output wave form using a calibrated oscilloscope.
5. To study the performance of a diode as clamper and sketch the output wave form using a calibrated oscilloscope.
6. To design a basic logic gate and verify its truth table.
7. To design a battery eliminator having the given specifications.
8. To design a low pass RC and high pass RC filter of given specifications.
9. Study of RC circuit as differentiator and trace the o/p at different values of i) frequencies ii) R and C
10. Study of RC circuit as Integrator and trace the o/p at different values of (i) frequencies (ii) R and C.

References

1. Experiments in electronics, by W.H. Events (Prentice-Hall, India)
2. Methods of Experimental Physics Vol.2, Electronic Method (Academic Press)