B.Sc. ELECTRONICS
Semester-III
Paper-I EL 301
Electronic Devices and Circuits-II

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 IC's (mono-lithic and Thin Film Imonolithic Fabrication techniques; crystal growth diffusion, epitaxy, Photolithography, metallization isolation, crossovers (detailed discussions). Monolithic devices BJT (npn. pnp), JFET MOSFET, Diodes Resistors, Capacitors (simple idea only)

Unit-II
Differential amplifier, Differential gain, Common mode gain, CMPR, ideal operational amplifier, Feed back in Op-Amp in inverting and non-inverting configuration, Buffer, summer, input bias current input offset voltage. Error introduced by offset voltage, integrating and Differentiating circuits using Op-Amp, difference, Multiplication, division, Threshold discrimination.

Unit-III
Principle of voltage regulation, shunt regulators, Zener diode Shunt regulator, BJT shunt regulator, Series Voltages regulator, feed back regulator, Power Supply regulation, using Op-Amp, Load regulation Stability, Zener diode regulator, short circuit protection, current regulation, using Op-Amp, regulators (IC 723 and three terminal regulators)

References:
1. Electronics for Scientists & Engineers by Vishwanathan Mehta and Rajaraman (Prentice hall India.
2. Electronic instrumentation and measurement techniques by WD Copper and AD Halfrick
3. Electronic Fundamental and applications IVth Edition by John D.Ryder.
4. Integrated Electronics by Millman & Halkias.
5. Electronic Devicies & circuit by Mottor shed.
6. Semiconductor Electronics by A.K.Sharma (New Age Internationals Pvt. Ltd., India)

B.Sc. ELECTRONICS
Semester-III
Paper – II EL 302
Combinational and Sequential Circuits

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
Saturated and non-saturated logics, Resistor, Transistor Logic (RTL), Diode transistor logic (DTL), Transistor-Transistor logic (TTL), Emitter Coupled Logic, (ECL), integrated Injunction logic (IIL), Complimentary Metal Oxide Semi-conductor (CMOS), Logic, current sinking and sourcing, logic circuit Parameters-Propagation delay, number of levels, Fan in, Fan out, Loading Noise margin, Combination circuit design procedure analog to digital converter, realization of Boolean expression with NAND/NOR gate, Design of a railway track switching system.

Unit-II
Half adder, Full adder, a parallel binary adder 8-4-2-1 adder or excess 3 adder, half substractor, full substractor, 2's compliment adder/substractor, multiplexer and their use in combinational logic design, Demultiplexer, Decoder and their use in combinational design, Parity generator/Checker, Code convertor.

Unit-III
Basics of sequential circuits, Asynchronous & synchronous sequential circuits, flip-flops, R-S, J-K-M, asterslave JK, T&D type flip-flops, Counters binary counter, Ripple counter and synchronous counter, Up and down counters.

References:
1. Electronics for Scientists & Engineers by Vishwanathan Mehta and Rajaraman (Prentice hall India.
2. Electronic instrumentation and measurement techniques by WD Copper and AD Halfrick
3. Electronic Fundamental and applications IVth Edition by John D.Ryder.
4. Integrated Electronics by Millman & Halkias.
5. Electronic Devicies & circuit by Mottor shed.

B.Sc. ELECTRONICS
Semester-III
Paper-III EL 303
Practical-III

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. To study & design Hartley oscillator & measure its frequency.
2. To study & design colpits oscillator & measure its frequency for two values of inductance & with ferrite core.
3. To study and design of phase shift oscillator and measure its frequency.
4. To study the condition for sustained oscillation for Wein bridge oscillator.
5. Operational amplifier
    1. Unity gain buffer 2. Inverting amplifer 3. Non-inverting amplifier
6. Operational Amplifier
    1. Summing amplifier   2. difference amplifier.
7. Measurement of offset voltage and bias currents & CMPR of an operational amplifier
8. Integrating & differentiating circuits using Op-amp.
9. To study the 555 IC timer and its application as monostable and astabel multivibrator.
10. To study the working of Schmitt trigger using operational amplifier.

B.Sc. ELECTRONICS
Semester-IV
Paper-I EL 401
Amplifier and Oscillator Circuits

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
Feedback-positive and negative feedback, Effect of negative feedback on gain, Non-linear distortion, input resistance, Frequency response, Voltage series and shunt feedback, Current series feedback. Active filters using Op-Amp (Lowpass and highpass Band pass and Band reject).

Unit-II
Principle of oscillators, condition for sustained oscillation, RF Oscillators, Hartley, Colpit, Crystal Oscillator (Principle of working and frequency of oscillation), AF Oscillators; Wein Bridge, Phase shift Oscillators.

Unit-III
Multivibrator (Astable, Bistable, Monostable, Schmitt Trigger, Unijunction transisitor, (UJT), Sillicon controller, Rectifier (SCR), Triac, Diac Sillicon Controller Switch (SCS), Controller rectification, pluse control of SCR Phase Control of SCR, SCR Controller circuits, UJT Sawtooth wave generator, Triangular waveform generator.

References:
1. Electronics for Scientists & Engineers by Vishwanathan Mehta and Rajaraman (Prentice hall India.
2. Electronic instrumentation and measurement techniques by WD Copper and AD Halfrick
3. Electronic Fundamental and applications IVth Edition by John D.Ryder.
4. Integrated Electronics by Millman & Halkias.
5. Electronic Devicies & circuit by Mottor shed.
6. Semiconductor Electronics by A.K.Sharma (New Age Internationals Pvt. Ltd., India)

B.Sc. ELECTRONICS
Semester-IV
Paper – II EL 402
Electronic Devices and Circuits-III

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
Memories, memory organization and its parameters. Read only Memories (ROM), Random Access Memory (RAM), Application of ROM, Static Random access memories (SRAM),Dynamic Ram, Digital to Analog conversion (D/A) Binary weight, ladder type, Serial, BCD, D/A conversion, Analog to digital conversion A/D, Single slope & dual slope and their parameters.

Unit-II
Trasducers classification, Strain gauge displacement, Temperature measurement Resistance Thermometer, Thermocouple and Thermistor, Photomultiplier tubes, photovoltaic cells Photoemissive cells, Light Emitting Diode (LED), construction and working.

Unit-III
Electronic Multimeter, Basic circuit, Characteristics of Electronic instruments, accuracy, precision sensitivity, Resolution and different types of errors, Cathode ray oscilloscope, Block diagram, Cathode ray tube (CRT), Electrostatic deflection, Post deflection, acceleration, Horizontal and vertical deflection system, Digital storage oscilloscope, Block diagram and explain in briefly.

References:
1. Electronics for Scientists & Engineers by Vishwanathan Mehta and Rajaraman (Prentice hall India.
2. Electronic instrumentation and measurement techniques by WD Copper and AD Halfrick
3. Electronic Fundamental and applications IVth Edition by John D.Ryder.
4. Integrated Electronics by Millman & Halkias.
5. Electronic Devicies & circuit by Mottor shed.

B.Sc. ELECTRONICS
Semester-IV
Paper-IV EL 403
Practical-IV

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. To study and design DTL NAND gate using discrete components and verify its truth table.
2. To study and design TTL NAND gate using discrete components and verify its truth table.
3. To study half Adder/full adder, and verify its truth table.
4. To study and verify the truth table of JK, D&T type flip-flaps.
5. BCD Decade counter, verify its truth table.
6. Study ripple Binary counter and verify its truth table.
7. Solid State Rectifier, Study of Characteristic under forward and reverse bias conditions.
8. To study the operation of transistorized Monostable multivibrator circuit and measure its delay time.
9. To study the operation of transistorized Astable multivibrator circuit and measure its frequency.

Projects topics are:
1. Electronic Multimeter using IC
2. Solid State Power controller using thyristor.
3. Function generator using IC
4. Time base generator
5. Regulated power supply using ICs.
6. Event Counter.
7. Transistor tester (NPN, PNP)
8. Electronic Timer with Alaram
9. Design of an under/over voltage cut off circuit
10. Transformer less o/p amplifier stage.

References:
1. Experiments in electronics by W.H. Events (Prentice Hall India)
2. Method of experimental Physics Vol.2 Electronic Method (Acad Press)
3. Experimental in electronics by Ravi Taj Dudeja.