

University of Kashmir

Course Title: **Electronics Equipment and Maintenance**

Semester-II

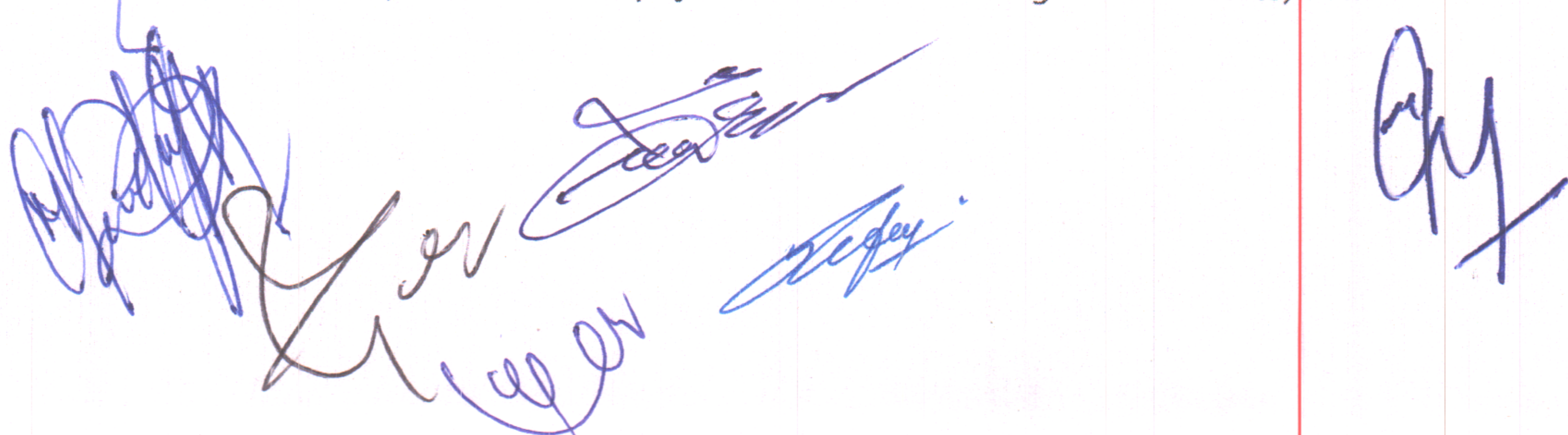
Course Code: **EEM-DSC 1B**

Paper-I: Principles of Electronics-II

Unit I:	Number systems Introduction to Decimal, Binary, Octal, Hexadecimal Number systems, BCD codes, Inter-conversions of decimal, Binary and BCD numbers, Parity, Exwss-3, Grey Logic Gates: Positive and negative logic, Different Logic Gates (AND, OR, NOT, NAND, NOR, EXOR) Boolean Algebra: Boolean operations, logic expressions, DeMorgan's theorems, minterms, maxterms, SOP and POS form of Boolean expressions for gate network, simplification of Boolean expressions using Boolean algebra and Karnaugh map techniques(up to 4 variables).
Unit II:	Logic Families and Combinational Circuits TTL, ECL and CMOS parameters (Power Dissipation, Speed, Supply Requirements, Logic Level, Fan in, Fan out), Noise Immunity. Combinational Circuits: Encoders and Decoders, Multiplexers and Demultiplexers, Adders and Subtractors
Unit III:	Sequential Logic Circuits Flip-Flops: SR latch using NAND gates, SR flip flop, JK flip flop, Master Slave JK flip flop, D type flip flop, T type flip flop. Shift register and Counters: serial in - serial out, serial in - parallel out, parallel in - serial out, parallel in-parallel out configurations. Ring counter, asynchronous counters, synchronous counters, up/down asynchronous counter, Mod-counter
Unit IV:	Operational amplifiers and its applications Characteristics, Parameters, Measurements; Emitter Coupled Differential Amplifier, Transfer Characteristics, Voltage gain, Inverting and Non-inverting amplifiers, Voltage follower, Phase inverter, Scale changer, Integrator and Differentiator circuits. Summing and Difference Amplifier 555 Timer: Astable and Monostable operations

References:

1. *Morris M Mano, Digital Design, Pearson Pub.*
2. *A. P. Malvino, Digital Principles and Applications, McGraw Hill International Editions (Fourth Edition)*
3. *R. P. Jain, Modern Digital Electronics, Tata McGraw Hill Pub. Company (Third Edition).*
4. *Thomas L. Floyd, Digital Fundamentals- Universal Book Stall.*
5. *William H. Gothmann, Digital Electronics: An Introduction to Theory and Practice, Prentice Hall of India.*
6. *R. A. Gayakwad, Operational Amplifiers and Linear Integrated Circuits, PHI*



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EEM LAB: DSC 1B LAB: Principles of Electronics-I LAB 60 Lectures

AT LEAST 06 EXPERIMENTS FROM THE FOLLOWING BESIDES #1

Practicals

1. Study of basic gates (verification of truth table) using ICs
2. Design and realization of AND, OR and NOT gates using diodes/transistors.
3. Construction of basic gates using NAND/NOR gates.
4. Construction and study of half adder using NAND gates.
5. Study JK and D Flip Flop using IC's.
6. Design and realization of adder and subtractor (using basic gates).
7. Design and realization of adders and subtractor using universal gates.
8. Design and realization of Multiplexers.
9. Design and realization of De-multiplexers
10. Design and realization of SR flip flop using NAND and NOR gates.
11. Design and realization of JK flip flop using NAND and NOR gates.
12. Design and realization of D flip flop using NAND and NOR gates.
13. Design and realization of T flip flop using NAND and NOR gates.
14. Study JK and D Flip Flop using IC's.
15. To study the various characteristics of 741 OP-amp.
16. To study OP-amp as
 - (a) Adder, (b) Subtractor, (c) Scale charger

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