

**SARDAR PATEL UNIVERSITY**  
**Programme & Subject: M.Sc (Electronics & Communication)**  
**Semester: I**

**Syllabus with Effect from: June - 2022 - 23**

<b>Paper Code: PS01CELC51</b>	<b>Total Credit: 4</b>
<b>Title of Paper: Electromagnetic Theory</b>	

Unit	Description in Detail	Weightage (%)
I	Scalar and vector, vector algebra, the rectangular coordinate system, vector components and unit vector, the vector field, dot product, cross product, cylindrical coordinate system, spherical coordinate system, Integration of vector, line integral, surface integral, circulation work & flux, volume integral, green's theorem, stoke's theorem, divergence theorem, del applied to function.	25%
II	Experimental law of coulomb; Electric field intensity; Field of a continuous volume charge distribution, line charge and sheet of charge; Streamlines and sketches of fields. Electric flux density; Gauss's law; Application of gauss's law; Some symmetrical charge distributions; Maxwell's first equation	25%
III	Poisson's and Laplace's equations; Uniqueness theorem; Examples of solution of Poisson's, Examples of solution of Laplace's equation.	25%
IV	Biot-savart law; Ampere's circuit law; Magnetic flux and magnetic flux density; Scalar and vector magnetic potentials. Faraday's law; Displacement current; Maxwell's equations in point form; Maxwell's equations in integral form	25%

**Basic Text & Reference Books:-**

- Engineering Electromagnetics: William H. Hayt, McGraw Hill, 5th Edition, 1992, 7th Reprint 1995.
- Elements of Engineering Electromagnetics: N. Rao, Prentice Hall, 3rd Edition, 1992.
- Theory and Problems of Electromagnetics: Joseph A. Edminister, McGraw Hill, 2nd Edition, 1993.

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<b>Paper Code: PS01CELC52</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Analog Interface Electronics</b>	

<b>Unit</b>	<b>Description in Detail</b>	<b>Weightage (%)</b>
I	Energy bands in semiconductor material, intrinsic and extrinsic semiconductor, carrier transportation, diffusion current, drift current, mobility, resistivity, generation and recombination of carriers, Hall Effect.	25%
II	PN Junction diode characteristics & its application, zener diode, LED, LDR, tunnel diode, Varactor diode, Schottkey diode, BJT, JFETs, MOSFETs.	25%
III	Differential amplifier and its DC & AC analysis, block diagram of OPAMP, its parameters, frequency response, current mirror and current loading biasing, concept of ideal op-amp, specification of standard op-amp like IC 741, LM 324, $\mu A$ 741.	25%
IV	Voltage amplifier, summing amplifier, averaging amplifier, current source, differential amplifier, instrumentation amplifier, filters: LPF, HPF, BPF and all pass filter.	25%

**Basic Text & Reference Books:-**

- Electronics Principle: A.P. Malvino
- Op Amps and Linear Integrated Circuits: Ramakant Gayakwad, PHI 3<sup>rd</sup> Edition 1993.
- Integrated electronics: Millman & Halkies, McGraw Hill, 9th reprint, 1995.

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<b>Paper Code: PS01CELC53</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Signals &amp; Systems</b>	

Unit	Description in Detail	Weightage (%)
I	Signals, Systems & Signal Processing, Classification of signals, the concept of frequency in continuous time and discrete time signals, sampling theorem.	25%
II	Discrete-time signals, sequences, Discrete time systems, Block diagram representation, Classification, Convolution representation of LTI systems, Analysis of Discrete time systems described by difference equations (except particular solution),.	25%
III	Z Transform, Properties of Z transform, Rational Z Transform, Inverse Z transform, Transfer function representation, Analysis of LTI systems in Z domain, Transient & steady state response, Causality & Stability.	25%
IV	Frequency Analysis of continuous time signals, Frequency analysis of discrete time signals, Fourier series and Power density spectrum of discrete time periodic signal. Fourier transform and Energy density spectrum of discrete time aperiodic signals. Relationships of the Fourier transform to the Z transform Frequency domain classification and concept of bandwidth.	25%

**Basic Text & Reference Books:-**

- Introduction to Signals and Systems: Edward W. Kamen, Macmillan Pub. Co., New York.
- Signals & Systems: continuous and discrete: Rodger E. Zimer, Maxwell Macmillan International (1990), Second edition.
- Digital Signal Processing : Principles, Algorithms, and Applications: John G Proakis & Dimitris G Manolakis, Prentice Hall India, 3rd edition

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<b>Paper Code: PS01CELC54</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Practical - I</b>	

	<b>Description in Detail</b>	<b>Weightage (%)</b>
1	To Study Characteristics of LDR.	
2	To Study OP-AMP as a Voltage Amplifier	
3	To Study OP-AMP as a Summing Amplifier	
4	To Study OP-AMP as a Averaging Amplifier	
5	To Study OP-AMP as a Instrumentation Amplifier	
6	To Study OP-AMP as a Differential Amplifier	
7	To Study Characteristics of LPF (1 <sup>st</sup> Order, 2 <sup>nd</sup> Order)	
8	To Study Characteristics of HPF (1 <sup>st</sup> Order, 2 <sup>nd</sup> Order)	
9	To Study Characteristics of BPF (1 <sup>st</sup> Order, 2 <sup>nd</sup> Order)	
10	To Study Diode Clipper Circuits	
11	To Study Diode Clamper Circuits	
And other Practicals Based on Syllabus.		

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<b>Paper Code: PS01CELC55</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Practical - II</b>	

	<b>Description in Detail</b>	<b>Weightage (%)</b>
1	Introduction to MATLAB	
2	To Generate Continuous Time Signal Using Matlab	
3	To Generate Discrete Time Signal Using Matlab	
4	To Perform Convolution of Signals Using Matlab	
5	To Find Solution Of Difference Equations Using Matlab	
6	To Find Fourier Series Representation of Continuous Time Signals.	
7	To Find Fourier Transform of Continuous Time Signals.	
8	To Find DTFT Using Matlab.	
9	Sampling and Reconstruction of Continuous Time Signals	
10	Introduction to SIMULINK and Calculation of Output of Systems Represented by Block Diagrams	
And other Practicals Based on Syllabus.		

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<b>Paper Code: PS01EELC51</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Computer Architecture &amp; Organization</b>	

Unit	Description in Detail	Weightage (%)
I	Instruction code, Design of computer instructions, Timing and Control Design, Instruction execution, Input, Output Instruction, Interrupt, Design of Basic Computer.	25%
II	Processor bus organization, Arithmetic Logic Unit, Stack Organization, General Instruction Format, Addressing Modes in instruction set, Data transfer instructions, Data Manipulations instructions, Program Control instructions, Microprocessor/Micro computer organization. Conventional control/Micro-Program control, Control Memory, Address sequencing, Micro-program sequencer.	25%
III	Algorithm for Addition, subtraction, Multiplication, Division for, unsigned number, Signed magnitude numbers, 1's Complement numbers, 2's complement numbers, floating point numbers, Decimal numbers, Processor configuration and design for different types of number representation.	25%
IV	Peripheral devices, I/O interfaces, Synchronous data transfer, Asynchronous data transfer, software/hardware approach for data transfer, Direct memory access, Priority interrupt, I/O processor, Multiprocessor system organization.	25%

**Basic Text & Reference Books:-**

- Computer Systems Architecture: Morris Mano, PHI, 1997, 3 rd Edition.
- Structural Computer Organization: Tanenbaum, PHI EEE, 1995.
- Computer Organization: W. Stallings, PHI EEE, 1997.
- Computer Organization: Hamacher, McGraw-Hill, 1994.

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<b>Paper Code: PS01EELC52</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Internet &amp; Web Technologies</b>	

Unit	Description in Detail	Weightage (%)
I	History of the Internet and World Wide Web, HTML 4 protocols, HTTP, SMTP, POP3, MIME, IMAP. Introduction to JAVA Scripts: Object Based Scripting for the web. Structures, Functions, Arrays, Objects.	25%
II	Introduction to Object refers, Collectors all and Children. Dynamic style, Dynamic position, frames, navigator, Event Model : On check, On load, Form process, Event Bubbles, Filters, Transport with the Filter, Creating Images, Adding shadows, Creating Gradients, Creating Motion with Blur, Data Binding, Simple Data Binding, Moving with a record set, Sorting table data, Binding of an Image and table.	25%
III	Audio and video speech synthesis and recognition, Electronic Commerce, E-Business Model, E- Marketing, Online Payments and Security, Web Servers, HTTP request types, System Architecture, Client Side Scripting and Server side Scripting, Accessing Web servers, IIS, Apache web server.	25%
IV	Database, Relational Database model, Overview, SQL, ASP, Working of ASP, Objects, File System Objects, Session tracking and cookies, ADO, Access a Database from ASP, Server side Active-X Components, Web Resources, XML, Structure in Data, Name spaces - DTD, Vocabularies, DOM methods.	25%

**Basic Text & Reference Books:-**

- Internet and world wide web – How to Program: Deitel & Deitel, Goldberg, Pearson Education Asia, 2001.
- Using HTML 4, XML and JAVA: Eric Ladd, Jim O’ Donnel, Prentice Hall of India – QUE, 1999.
- Web Programming: Desktop Management: Aferganatel, PHI, 2004.
- Web Technology: Rajkamal, Tata McGraw-Hill, 2001.