



FYJC SYLLABUS FOR ELECTRONICS

Electronics – I : Basic Electricity and Components

1. Sources of Power
 2. Kirchhoff's Laws and Network Theorems
 3. Electromagnetism and Electrostatics
 4. AC Fundamentals and Circuits
 5. Instruments
 6. Study of Components – I
 7. Study of Components – II
-

Electronics – II : Semiconductor Devices and Circuits

1. Semiconductors
2. Study of Transistors
3. Study of Semiconductor Components
4. Amplifiers
5. Oscillators

1. Instruments

Detailed study of CRT (Mathematical Part not expected). How a CRO displays waveform, block diagram of CRO, Front panel controls, Application of CRO.

Function Generator – basic elements of function generator.

Digital Multimeter – block diagram.

(12 Lectures, 15% Marks)

2. Power Supply

Half wave rectifier, Full wave rectifier, Bridge rectifier, Filter circuit, Load regulation, Line regulation, Zener as voltage regulation, Basic principle of voltage regulation using transistor circuit.

Three terminal regulator IC's

Basic Principle of SMPS and its advantages.

(12 Lectures, 20% Marks)

3. Transducers

Classification of transducers, Selection of transducers, Types of transducers, Working of following transducers – Thermistor, LDR, Capacitive transducer, LVDT, Piezoelectric crystal, Loud-speaker, Gas sensor, Opto-coupler.

(10 Lectures, 10% Marks)

4. Operational Amplifiers

Necessity of Op-Amp, Block diagram of Op-Amp, Op-Amp parameters. Linear applications of Op-Amp : Inverting and Non-inverting Amplifier, Buffer amplifier, Concept of virtual ground. Adder, Subtractor, Integrator and Differentiator circuits.

(Definition in each case expected)

Non-linear Applications – Comparator, Schmitt trigger.

(12 Lectures, 25% Marks)

5. Modern Electronic Communication

The elements of communication system, types of electronic communication, survey of communication applications, electronic spectrum, concept of bandwidth, AM principles, Modulation index and percentage of modulation, Sidebands and frequency domain, Frequency modulation (Principle), Phase modulation (Principle).

Types of communication satellites, Satellite communication system, Application overview of satellite communication, Concept of Digital Communication.

Introduction to Modems

Introduction to Computer networks

Use of fiber optics in communication

Review of some modern communication applications : concept of FACSIMILE, Cellular radio and Radar.

(24 Lectures, 20% Marks)

6. Study of Integrated Circuits:

Block diagram, Pin functions and simple applications of the following : IC's – 555, 741 and LM 317. Use of IC-555 as astable and monostable.

(10 Lectures, 10% Marks)

Paper – II : Digital Electronics

7. Number System and Boolean Algebra :

Decimal, Binary and Hexadecimal number system, BCD code, Binary to decimal and decimal to binary conversion, Hex to Binary and Binary to Hex conversion, Hex to Decimal and Decimal to Hex conversion, ASCII code, Binary Arithmetic.

(10 Lectures, 15% Marks)

8. Basic Logic Gates :

Study of NOT, OR, AND gates, Symbols and truth tables, Boolean algebra; NAND, NOR as universal building blocks, De Morgan's theorems, EXOR gate, Half Adder, Full Adder.

(10 Lectures, 15% Marks)

9. Logic Families and IC Specification :

Introduction to Logic families – Bipolar logic families and unipolar logic families.

Characteristics of Digital IC's, TTL NAND gate, CMOS, NAND, NOT, NOR gates.

Open collector TTL NAND gate, Tristate concept, Tristate TTL NAND gate.

(12 Lectures, 10% Marks)

10. Multiplexers – De Multiplexers, Encoder – Decoder :

Multiplexers and their use in combinational logic design, Combinational logic design using multiplexers. De Multiplexer and its use in combinational logic design.

Encoder – Priority encoders

Decoder – decoder, and drivers for display devices.

(12 Lectures, 20% Marks)

11. Flip Flops, Counters and Registers :

S-R Flip-Flop, Clock, Clocked S-R flip-flop, D flip-flop, T flip-flop, JK flip-flop, Edge triggered flip-flops, Master Slave concept, Ripple or Asynchronous counters, Decade counter, Synchronous counter. Registers, Shift register.

(14 Lectures, 20% Marks)

12. A/D and D/A Converters :

Introduction, Digital to Analog converter – Weighted resistor ladder, R-2R ladder.

Analog to digital converter – Counter type ADC, Successive approximation A/D converter.

(12 Lectures, 12% Marks)

13. Computer :

Block diagram of computer, Concept of bus, Study of Input-Output devices like keyboard, mouse, light pen, digitizer, printer and its types, plotters.

Study of memory devices like hard disk, floppy drives, semiconductor memory, magnetic tape. Specifications of computer.

(10 Lectures, 8% Marks)

Model Question Paper