

DEPARTMENT OF ELECTRONICS AND PHYSICS
GITAM INSTITUTE OF SCIENCE
GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)
(Declared as Deemed to be University u/s 3 of the UGC Act, 1956)
GRCET - 2019

ELECTRONICS
Syllabus
PART-A

Research Methodology: Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology.

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem.

Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design.

Sampling Design: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure.

PART-B
SUBJECT: ELECTRONICS

Unit-I

BJT and FET

Bipolar Junction Transistor(BJT)

Three configurations of transistor, Biasing, BJT as an amplifier, BJT characteristics, Applications of Transistor.

Field Effect Transistor(FET)

Construction and characteristics, Biasing, FET as an amplifier, Applications of FET. MOSFET: Introduction, Depletion and Enhancement type MOSFETs. Feedback concepts: Practical feedback circuits, Feedback amplifiers, Oscillator operation, types of oscillators

Unit-II

Operational Amplifiers

Op-amp Basics, parameters, Practical op-amp circuits – Integrator, Differentiator and Summing amplifier. Op-amp Applications-Constant gain multiplier, Voltage to Current Converter, Current to Voltage Converter and filters.

Unit-III

Combinatorial and Sequential Logic Circuits

Combinatorial logic circuits

Simplification of Boolean expressions, Karnaugh map method, Encoders and Decoders, Multiplexers and Demultiplexers Binary addition, subtraction, multiplication and division.

Sequential logic circuits

Flip-Flops, Counters: Asynchronous (ripple) counters, Down counter, Synchronous counters, Up-down counter, Ring counter, Johnson counter.

Unit-IV

Electronic Communications & Microprocessors

Electronic Communications

Amplitude Modulation: Modulation Index, Frequency spectrum, Average Power. A.M Broadcast Transmitter and Super heterodyne receiver Output S/N ratio.

FM Modulation-Direct and Indirect methods. Detection methods - Slope detector, balanced slope detector, Amplitude limiter, Pre-emphasis and De-emphasis.

Microprocessors

Evolution of Microprocessors, Architecture and Pin Description of 8086, Instruction set. Memory organization- Register structure, Interfacing devices: 8255-I/O Ports and Programming, 8251-Serial communication interface and Programmable Interval Timer 8253 and Programmable Interrupt Controller 8259

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Model Paper**

PART-A

Section- I: Consists of FIFTY Objective type questions. 50 x 1 = 50 Marks

1. The statement of purpose in a research study should:
 - (a) Identify the design of the study
 - (b) Specify the type of people to be used in the study
 - (c) Identify the intent or objective of the study
 - (d) Describe the study

2. Which of the following would generally require the largest sample size?
 - (a) Cluster sampling
 - (b) Simple random sampling
 - (c) Systematic sampling
 - (d) Proportional stratified sampling

Section- II: Consists of TEN two mark questions. 10 x 2 = 20 Marks

PART-B

ELECTRONICS

Examination Duration: 2 hours

Max. Marks: 140

Section –I

Answer all objective type questions, Each question carries ONE mark.

50 ×1 =50

1. When transistors are used in digital circuits they usually operate in the:

- | | |
|----------------------------------|---------------------|
| A) Active region | B) Breakdown region |
| C) Saturation and cutoff regions | D) Linear region |

2. A JFET

- | | |
|-----------------------------------|-------------------------------|
| A) is a current-controlled device | B) has a low input resistance |
| C) is a voltage-controlled device | D) is always forward-biased |

Section –II

Answer all fill in the blank type questions, Each question carries TWO marks.

10 × 2 = 20

1. The capacitor that produces an ac ground is called _____

2. In a class B push-pull amplifier, the transistors are biased slightly above cutoff to avoid _____

3. Often, a common-collector will be the last stage before the load; the main function of this stage is to _____