

GURU GHASIDAS UNIVERSITY, BILASPUR

VERT (Electronics)-2018

Note: 50 MCQ type (objective type) questions from Part A and 50 similar questions from Part B be set

Each question will be of 01 (One) Mark

PART A:

Unit 1:

Fundamentals of Research: Aims and objectives of research, Types of research – basic, novel and applied research. Tools for searching research topic – books, journals, internet, discussions etc.

Research hypothesis, Steps in research design. Research Aptitude : Qualities of a researcher, Logical reasoning, Test for intelligence , Basic mathematics. Ethics in research – plagiarism

Unit 2:

Elements of computational techniques: root of functions, interpolation, extrapolation, integration by trapezoid and Simpson's rule, Solution of first order differential equation using Runge- Kutta method.

Basic architecture of computer, basic computer programming, C and Fortron.

Unit 3:

Boolean algebra, logic gates, combinational and sequential circuit, A/D and D/A converter, Multivibrators, Logic Families, architecture of 8085 and 8086 micro-processor, addressing modes, 8085-instruction set, interrupts, programming and interfacing, introduction of Microcontroller.

Unit 4:

Opto-electronic devices (solar cells, photo-detectors, LEDs), Nuclear detectors: Crystal Detectors, PIN Diode Transducers (temperature, pressure/vacuum, magnetic fields, vibration, optical, and particle detectors, Op – Amp based filters and oscillators

Unit 5:

Data interpretation and analysis. Precision and accuracy Error analysis, propagation of errors. Least squares fitting, Linear and nonlinear curve fitting, chi-square test.

Handwritten signatures:
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Part B:

UNIT-1

Electronics Transport in semiconductor, PN junction, Diode equation and diode equivalent circuit, Diode: Zener, Tunnel, Semiconductor diodes, BJT, FET, MOSFET, IC fabrication- crystal growth, oxidation, lithography, doping, etching, isolation, thin film active and passive devices, Rectifiers, biasing of BJT, JFET, single stage and multistage amplifiers, oscillators, OPAMP- characteristics and Applications, multivibrator.

UNIT-2

Theorems: Superposition theorem, thevenins, Norton, maximum power theorem, Laplace, Fourier and Z-transformation, two port network [parameters, transfer function, graph theory, AC circuit analysis; transient analysis.

Open loop and closed loop control system, bode plots, nyquist criterion, error amplifier, characteristics of control system- accuracy, sensitivity, stability, disturbance and transient response, Routh Hurwitz criterion.

UNIT-3

Basic principles of amplitude, frequency and phase modulation and de-modulation, principle of super heterodyne receiver, random signals and noise, noise temperature and noise figure, basic concepts of information theory, modulation and de-modulation in PM, PCM, ASK, FSK and PSK, time and frequency division multiplexing, data communication-circuits, codes and modems, signal processing and digital filters.

UNIT 4

Maxwell equation, wave equation and solution, time varying field, wave guides, propagation of waves, Poynting vectors, antenna parameters, transmission lines, impedance matching, micro wave components-T, magic T, direction coupler, isolator, circulator, microwave sources-klystron, magnetron, Basic theory of gunn, GaAs FET, PIN diode and crystal deflector

UNIT 5

Optical sources-LED and LASER, spontaneous and stimulated emission, photodetectors, PN photo diode, photo transistor, solar cell, PIN photodiode, optocouplers, optical fibre-Light propagation in fibre, Characteristics, types of fibre, modes, fibre splicing, optical communication system, transducers-resistance, inductance, capacitance, piezoelectric, thermoelectric, photo electric and hall effect.

Handwritten signatures:
Whitby, Steve, Tredder, J. J. J., Livedi, J. J., J. J.