

SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES

Raebareli Road, Lucknow-226014 (U.P.)

Syllabus for the post of Junior Engineer (Telecom)(Core Subject) Advt No. I/10/2/Rectt/2026-27

(Syllabus is only Indicative. The questions can assess any aspect of knowledge, aptitude, attitude and practical skills, which is expected from a trained person to work efficiently at the advertised post)

Computer Architecture

Computer architecture, basic computer organization and design programming, CPO, I/Q organization, memory organization. Control unit design. Familiarization with DOS and Windows – concept of file, directory, folder, Number system, Programming – Elements of high-level programming Language, PASCAL, C: Use of basic data structure.

Web Page Design: Scripting Language – Perl/CGI/JavaScript; Fundamentals of JAVA Programming; Advanced Features of JAVA Programming.

Data Communication and Computer Network

Data Network and Networking Basics; MAC & Data Link Layer Network, Transport (TCP/IP). Introduction to Computer Network, LAN, MAN, WAN, Network essentials, Internet addresses, ARP, RARP, Internet protocols, user datagram protocol, transmission control protocol, internet multicasting, socket interface, domain name system, applications.

Data Structure and Algorithms

Basic concept of data representation, introduction to algorithms design and data structure, Arrays stacks and queues, linked lists, storage allocation and garbage collection, symbol tables, Searching, Sorting and Merging Techniques.

Database Management System

Database, Data models, relational algebra and normalization, statistical quality level, distributed and object databases. Introduction to the Relational Model; Normalisation and Query Processing; Recovery, Concurrency Management and Database Security.

Electronic/Electrical Measurement & Measuring Instrument

Electrical Measuring instrument, Watt meters and energy meters, measurement of resistance, measurement of inductance and capacitance, electronic voltmeters, audio and radio frequency measurements, AF & RF Power measurement, digital measurement.

Electrical Installation & Maintenance

Single Phase supply vs. 3 phase, Star Delta connection, relation between phase & line voltage power factor. All types of motor and generators – AC & DC Transformers, starters, rectifiers, inverters, batteries. Installation commissioning, earthing insulation. Testing and maintenance, preventive maintenance, electrical accidents and safety measures, switchgear, sub-station maintenance of relays and circuit breakers. AC Circuits, Circuit theorems, four terminal passive Networks, Coupled circuits and their analysis, Passive filters, lightning protection, power electronics application in control of drivers, Refrigeration & air-conditioning.

Fundamentals of Digital Circuits

Fundamentals of digital electronics, Transistor as a switching element; Boolean algebra, simplification of Boolean functions, Karnaugh Maps and applications; Number system, IC Logic Gates, Logic-Circuits, Encoders and Decoders, binary code converters, Arithmetic Logic Units (ALU), DTL, TTL, NMOS, PMOS and CMOS gates and their comparison; combination

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logic circuits; Half adder, full adder; Digital comparator, multiplexer Demultiplexer; ROM and applications. Flip-flops, R-S, J-K, D and T flip-flops; different type of counters and registers; A/D and D/A converters.

Communication Systems

Amplitude, frequency and phase modulation, generation and demodulation, Noise. PCM, basic principles of SPC Exchanges. Quantization & Coding; time division and frequency division multiplexing; Equalization; optical communication in free space & fibre optic; propagation of signals at HF, VHF, UHF and microwave frequency; Satellite Communication.

Foundation in Information Technology

Information System

Hardware; Software; Software Engineering; Operating systems.

Computing: An Object-Oriented Approach

Introduction to object-oriented concepts; object-oriented programming language; object-oriented analysis and design.

Discrete Electronic Devices & Circuits

The P-N Junction, Junction Diode, Zener Diode, B.J.T. configurations and biasing, low frequency low signal Hybrid models of BJT; JFET, MOSFET, CMOS, photo-electric devices, feedback amplifiers, Oscillators, R.F. Voltage amplifiers using BJT, special semiconductor devices.

Microprocessors

Architecture & programming of 8086/8088, microprocessor-based data acquisition, memory address & DMA controllers, arithmetic co-processor, other microprocessor applications. Study of Peripheral Chips: 8255, 8279, 8155, 8259. Study of ADC 0808, DAC 0800.

Radio Communication Systems

Principles of Radio Communication, A.M., F.M., Radio, Phase Modulation. Signal conditioning and Transmission study of special chips, output interfacing, output instruments – indicators, recorders, data acquisition systems, data loggers, servo mechanism, electronic process control instrumentation. Wave propagation, Microwave devices & components, microwave measurements, antenna fundamentals & their characteristics. Audio engineering, sound transducers, sound recording & reproduction, sound transmission, radio transmission, radio reception.