Topics for Computer Based Test for various posts:

AE/ Electrical & JE/ electrical

S.No.	Topic Description
1	Electric circuit, ohm's law, Kirchhoff's law, Calculation of KVA, KW, KVAr power, and network theorems
2	Capacitance and inductance
3	Electromagnetic Induction
4	Batteries and battery charger
5	Electrical Instruments and Measurement
6	A.C Fundamentals
	AC power supply
	DC power supply
	Transformer
	Motors
	Sub station and protection system
	Transmission and distribution system
	Earthing system
	SCADA
7	Industrial application of electric motors
8	Power electronics

AM/HRM & AO/ HRM

S.No.	Topic/Area
1.	Strategic Human Resources Management
2.	Industrial Relations
3.	Training and Development
4.	Recruitment & Selection
5.	Labour Legislation
6.	Performance Appraisal & Compensation Management
7.	Organizational Behavior
8.	Emerging trends in HRM including Competency Mapping

9.	Managing Diverse Workforce
10.	Change Management & Organizational Development
11.	Cross Cultural Management
12.	Manpower Planning
13.	Employee Misconduct & Disciplinary procedure
14.	Job Description & Job Analysis
15.	Employee Welfare

Assistant Engineer(S&T)

1 . Basic Electronics Engineering:
Basics of semiconductors; Diode/Transistor basics and characteristics; Diodes for different uses; Junction & Field Effect Transistors (BJTs, JFETs, MOSFETs); Transistor amplifiers of different types, oscillators and other circuits; Basics of Integrated Circuits (ICs); Bipolar, MOS and CMOS ICs; Basics of linear ICs, operational amplifiers and their applications-linear/non-linear; Optical sources/detectors.

2. Basic Electrical Engineering:
DC circuits-Ohm's & Kirchoff's laws, mesh and nodal analysis; Electro-magnetism, Faraday's & Lenz's laws, induced EMF and its uses; Single-phase AC circuits; Transformers, efficiency; Basics-DC machines, induction machines, and synchronous machines; Electrical power sources- basics: hydroelectric, thermal, nuclear, wind, solar.

3. Electronic Measurements and Instrumentation:
Principles of measurement, accuracy, precision and standards; Analog and Digital systems for measurement, measuring instruments for different applications; Different types of transducers and displays.

4. Power Electronics and Electrical Storage Devices and Power converters:
Basics of Power Electronics, Basics about Power devices such as thyristors/ SCRs; Electrical Storage Devices- Primary and Secondary Cells; Power Converters- DC-AC Converters(Inverters), AC-DC Converters(Rectifiers).

5. Analog and Digital Circuits:
Small signal equivalent circuits of diodes, BJTs and FETs; Diode circuits for different uses; Biasing & stability of BJT & JFET amplifier circuits; Analysis/design of amplifier-single/multi-stage; Feedback & uses; Active filters, timers, multipliers, wave shaping, A/D-D/A converters; Logic gates, Digital IC families, Combinatorial/sequential circuits; Basics of multiplexers, counters /registers/ memories /microprocessors, design & applications.

6. Analog and Digital Communication Systems:
 Analog versus digital communication & applications: Systems- AM, FM, transmitters/receivers, SNR comparison; Digital communication basics: Sampling, quantizing, coding, PCM, DPCM, multiplexing-audio/video; Digital modulation: ASK, FSK, PSK; Multiple access: TDMA, FDMA, CDMA

7. Computer Organization and Architecture:
Basic architecture, CPU, I/O organisation, memory organisation, peripheral devices, trends; Hardware /software issues; Data representation & Programming; Operating systems-basics, processes, characteristics, applications; Memory management, virtual memory, file systems, protection & security; Data bases, different types, characteristics and design; Elements of programming languages.

8. Electro Magnetics:
Wave propagation through different media; Transmission Lines-different types, basics, Smith's chart, impedance matching/transformation, S-parameters, uses; Waveguides-basics, rectangular types, modes, cut-off frequency ; Antennas-radiation pattern, monopoles/dipoles, gain, arrays-active/passive, theory, uses.

9. Advanced Electronics Topics:
VLSI technology: Processing, lithography, interconnects, packaging, testing; Microprocessors & microcontrollers, basics, interrupts, DMA, instruction sets, interfacing; Controllers & uses; Embedded systems.

10. Advanced Communication Topics:
Communication networks: Principles /practices /technologies /uses /OSI model/security; Basic packet multiplexed streams/scheduling; Cellular networks, GSM, CDMA , protocols (TCP/TCPIP); Basics of RADAR & Satellite Communication and uses; Optical communication: fibre optics.

Junior Engineer(S&T) & Junior Engineer(S&T)- Design

1 . Electronic Devices and Circuits:
Basics of semiconductors and devices; Diode/Transistor/ BJT/ JFET/ MOSFET.

2. Electrical Circuits and Instrumentation:
DC circuits-Ohm's & Kirchoff's laws, mesh and nodal analysis; Electro-magnetism, Faraday's & Lenz's laws, induced EMF and its uses; Analog and Digital systems for measurement, measuring instruments for different applications; Basics of Transducers and applications in instrumentation; Basics of batteries (Primary and Secondary) and their uses.

3. Electrical Machines:
Basics of Electrical Machines- Motors, Transformers, etc; Electrical power sources- basics: hydroelectric, thermal, nuclear, wind, solar.

4. Power Electronics:
Basics of Power Electronics, Basics of Power devices such as Thyristors/ SCRs.

5. Industrial Electronics and Linear Integrated Circuits
Electronics Fundamentals, Resistance and Basic Circuit laws, Electromagnetics and Inductance, capacitance, AC resistive, capacitive and inductive circuits, semiconductor

devices, Photoelectronics (LED and Photodiode), Basics of Meters such as Voltmeter, Ammeter, Multimeter, etc.

6.Linear Integrated Circuits
Basics of few linear Integrated Circuits as Opamp, 555 timer and applications.

7.Digital Electronics:
Logic gates, Digital IC families, Combinatorial/sequential circuits; Basics of multiplexers, counters /registers/ memories /microprocessors, design & applications.

8. Communication Engineering:
Analog Vs Digital communication & applications: Systems- AM, FM, transmitters/receivers; Digital communication basics: Sampling, quantizing, coding, PCM, DPCM, multiplexing- audio/video; Digital modulation: ASK, FSK, PSK; Multiple access: TDMA, FDMA, CDMA.

9. Computer Hardware and Network:
Basics of Computer architecture, CPU I/O organization, computer memory concepts, Basic computer networking, topologies, network components such as repeaters, bridges, routers, etc.

10. Electro Magnetics:
Wave propagation through different media; Transmission Lines-basics; Waveguides-basics, rectangular types, modes, cut-off frequency; Antennas-basics, types of antennas.

11. VLSI:
VLSI technology: Processing, lithography, interconnects, packaging, testing.

12. Microcontrollers and Embedded Systems:
Microprocessors & microcontrollers, basics, interrupts, DMA, instruction sets, interfacing; Controllers & uses; Embedded systems.

13. Advanced Communication Topics:
Communication networks: Principles /practices /technologies /uses /OSI model/security; Basic packet multiplexed streams/scheduling; Cellular networks, GSM, CDMA , protocols (TCP/TCPIP); Basics of RADAR & Satellite Communication and uses; Optical communication: fibre optics.

Note: **The above mentioned topics are indicative in nature and only covers broad areas. However, Question Paper may comprise questions from other areas also.**