Syllabus for the post of JUNIOR TECHNICAL ASSISTANT (Electrical Engineering)

(A) WRITTEN TEST

Devices and Circuits: Circuit Theorems; Semiconductor Devices and their biasing Circuits: Rectifiers, filters, amplifiers, Operational amplifier and its circuits; interfacing with Arduino **DC/AC Circuit Analysis**: Single and Three Phase circuits, Power electronic devices and circuits: SCR controlled rectifier;

DC/AC Electrical Machines: DC Motor and Generator, Single and Three phase transformers, Induction and Synchronous motors.

Digital Electronics: Number systems, Combinatorial and Sequential circuits: Arithmetic circuits, Counters, shift-registers, and finite state machines.

Data converters: sample and hold circuits, ADCs and DACs; Semiconductor memories: ROM, SRAM, DRAM.

Embedded Systems: architecture, programming, memory and I/O interfacing

Signal Processing: Continuous and Discrete time signals, and their Fourier representations, sampling theorem; LTI systems and their properties, digital filter design techniques.

Communications: Analog and Digital communications concepts, Modulation/Demodulation concepts, Transmitter and Receiver, Channel capacity.

Control Systems: Feedback systems and their analysis, Bode plots, root loci, compensation techniques, transient and frequency response, PID controllers.

(B) SKILL TEST

The candidate will be allowed to choose two of the following four topics:

(i). Electrical/Electronic circuits: Operating electrical/electronic instruments and equipment's, testing and debugging of electrical/electronic circuit and systems, Arduino programming, FPGA programming.
(ii). Communications and Signal Processing: Implementing communication and signal processing related functions
(iii). Electrical machines and power engineering, and
(iv). Embedded Systems – programming of microprocessor/microcontroller

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