Syllabus for the post of JUNIOR TECHNICAL ASSISTANT (Inter-Disciplinary Research Platform)
(WRITTEN TEST & SKILL TEST)

(Suitable for candidates with Mechanical/Mechatronics Engineering background)
WRITTEN TEST & SKILL TEST

Prototyping using CAD/CAM: Standard machine tools and their operations like turning, drilling, milling and finishing operations; basics of CAD software for designs, understanding related to the operation and working principles of advanced manufacturing and inspection equipment such as CNC Machines, 3-D Printers, knowledge of computational tools for component fabrication; knowledge of programming for component fabrication; reverse Engineering of components using 3D measurements.

Kinematics and dynamics of mechanisms and machines: Transmission system, gears and gear trains; Statics and Dynamic Balancing; Single-DoF Vibration; spatial transformations; geometrical parameters of robots; forward kinematics of robots.

Control of mechatronic systems: Basic characteristics of the feedback system, open/closed-loop control and structures; PI, PD and PID controller design, actuators, sensors; basic computer programming, programming of embedded systems, e.g., Arduino.

General Skills: Planning & performing simple repairs, overhauling different machines and checking functionality, knowledge of different apparatus/machines, preventive maintenance, basic geometrical measurements for inspection and quality control

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(Suitable for candidates with Electronics and Communication Engineering/ Electronics and Electrical Engineering/ Instrumentation/ Electronics/Electrical Engineering background)

WRITTEN TEST & SKILL TEST

Basic Circuit Analysis KVL-KCL; Circuit Theorems; Semiconductor Devices diode, transistor, Different diode rectifiers; filters; biasing circuits of Transistors; basics of power electronics circuits, SCR controlled rectifier; Basics of Electrical Machines, Operational amplifier and its circuits; Digital Electronics and basics of 8085 Microprocessors; Different modulation techniques; feedback control systems; transfer function and block diagram reduction technique; Basic programming using C, Assembly.

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