

**SYLLABUS FOR THE WRITTEN EXAM TOWARDS TRAINING  
OFFICER POSITION PUBLISHED VIDE ADVERTISEMENT NO. 2022/01  
DATED 05/05/2022**

<b>I.</b>	<b>General English including Grammar</b>	<b>10 marks</b>
<b>II.</b>	<b>Logical Reasoning and Analytical Ability</b>	<b>20 marks</b>
<b>III.</b>	<p><b>CORE-HARDWARE</b></p> <p><b>Logic Design:</b> Number System and codes, Computer arithmetic (fixed and floating point), Boolean Algebra and Logic gates, Design and Analysis &amp; implementation of Combinational Circuits and Sequential logic design</p> <p><b>Basic Electronics:</b> Semiconductor Basics, Diodes, Transistors, Regulators, Filters, Basic Circuits Concepts, Passive components: Resistance, Inductance, Capacitance, Electric Circuit</p> <p><b>Computer Networks:</b> Types of networks, Line configuration, Modes of transmission, Network Topologies, OSI Model, TCP/IP Suite, IP addressing: class A, B, C, D, E, Private/Public IP Addresses, IP Subnetting, Networking devices, Routing Basics and Layer 2 Switching fundamentals.</p> <p><b>Embedded System:</b> Microcontroller Based Embedded System Design, Salient Features of Modern Microcontrollers, Fundamentals of Physical Interfacing, Connecting Input Devices: Switches, Keyboard and Output devices: LEDs, Seven Segment Displays, Fundamentals of Analog to Digital conversion, Digital to Analog Conversion, Pulse width modulation, Timers in Embedded systems, remote access to embedded systems.</p>	<b>25 marks</b>
	<p><b>CORE-SOFTWARE</b></p> <p><b>Data Structures</b> Linear and non linear data structures, Arrays, Stacks, Queue, Linked list and Tree, Graph, Recursion, Binary search trees, Binary heaps, Graph and Tree Algorithms, Sorting, Searching, Hashing, Complexity.</p> <p><b>Computer Organization and Architecture</b> Functional blocks of a computer, Data representation, Machine instructions and addressing modes, Instruction pipelining, x86 architecture, Memory</p>	<b>25 marks</b>

	organization, Peripheral devices and their characteristics, Input-output subsystems, I/O device interface, I/O transfers, software interrupts, Programs and processes, Pipelining, Parallel Processors, Memory organization.	
	<b>Operating System</b> Operating Systems: Operating System Structure, Operations and Services, System Calls. Operating System Design and Implementation, System Boot, Processes, Threads, Process Scheduling, Inter-process communication, Concurrency and synchronization. Deadlock, CPU scheduling, Memory management and virtual memory, I/O Hardware, File Management, Disk Management, Robot Operating system, Linux based SSH	
	<b>Database Management Systems</b> Database system architecture, Data models, Integrity constraints, Database Design & ER modeling, Normal forms, Structured Query Language (SQL),	
	<b>Software Engineering and Design</b> Software Process Models, Software Requirements, Object oriented design using UML, Software Design, Software Quality, Software Testing.	
	<b>Advanced Areas</b> Machine learning, Web Technologies, Javascript, PHP, Internet, Information Theory , Coding, Internet-of-Things, Computer Cryptography & Network Security.	
	<b>Domain Knowledge:</b> Bloom's taxonomy, Pedagogical tools & Pedagogical Strategies , Human Resource Management , Staffing: Recruitment and Selection, Performance Management, Compensation and Evaluation System, Staff Training and Development.	<b>20 marks</b>