THE HIGH COURT OF MEGHALAYA
SHILLONG

(SYLLABUS DETAILS FOR SYSTEM OFFICER)

No.HCM.I/202/2018/122 **Dated Shillong the 8th July, 2019**

The syllabus details appended herein below is the Syllabus Details for the post of System Officer notified vide this Registry's Advertisement No.HCM.II/98/2015-Estt/5516 dated 1st November, 2019, is hereby notified for information of all concerned.

SYLLABUS DETAILS

Digital Computer Principles: Number systems – Binary, Decimal, Octal and Hexadecimal Conversion, Arithmetic operations, Boolean algebra, Logic gates, SOP, POS, Minterm and maxterms, Boolean expression, simplification, Postulates and theorems, Simplifications, K-Map, Combinational logic circuits – Adder, Substractor, Multiplexer, Demultiplexer, Encoder, Decoder, Sequential Circuits – SR, JK, T, D flip flops, Shift registers, Asynchronous, synchronous and Modulo n Counters.

Computer Organization and Architecture: Multiprocessors and microcomputers, Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Cache and main memory, Secondary storage, Semiconductor memory – Internal organization, SRAM, DRAM, SDRAM, Rambus memory, ROM technology, virtual memory, Instruction sequencing, Instruction execution, Hardwired control and microprogrammed control, micro instructions, Instruction pipelining.

Programming and Data Structures: Programming in C; Functions, Recursion, Parameter passing, Scope, Binding; Abstract data types, Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps.

Algorithms: Analysis, Asymptotic notation, Notions of space and time complexity, Worst and average case analysis; Design: Greedy approach, Dynamic programming, Divide-andconquer; Tree and graph traversals, connected components, Spanning trees, Shortest paths; Hashing, Sorting, Searching. Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concepts of complexity classes P, NP, NP-hard, NP-complete.

Graph Theory: Connectivity, covering, colouring, planarity, isomorphism. Computer Graphics: Line drawing, circle drawing, filling, hatching, 2D/3D transformations, projections, hidden surface removal.

Theory of Computation: Regular languages and finite automata, Context free languages and Push-down automata, Recursively enumerable sets and Turing machines, Undecidability.

Object Oriented Programming: Object oriented design concepts, programming in C++, Java.

Databases: ER-model, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control.

Set Theory: Sets, relations, functions, groups, partial orders, lattice, algebraic structures.

Theory of Computation: Regular languages and finite automata, context-free languages & pushdown automata, recursively enumerable sets & Turing machines, undecidability.

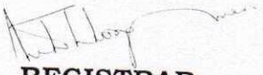
System Software: Compiler design, lexical analysis, parsing, syntax directed translation, code generation and optimization, Assemblers, linkers and loaders, macroprocessors, operating systems – processes, threads, inter-process communication, synchronization, deadlocks, CPU scheduling, memory management and virtual memory, file systems, I/O systems, protection & security, Module.

Information Systems and Software Engineering: information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, implementation, maintenance.

Computer Networks: ISO/OSI stack, LAN technologies (Ethernet, Token ring), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), Application layer protocols (icmp, dns, smtp, pop, ftp, http); Basic concepts of hubs, switches, gateways, and routers. Network security basic concepts of public key and private key cryptography, Hash function, Digital signature, Firewalls, User authentication – Token based, Biometric, Remote user authentication, Intrusion Detection Systems, Honey pots, Denial of Service, wireless networks, 2G and 3G networks, Bluetooth.

Web technologies: HTML, XML, basic concepts of client-server computing, web server, proxy server, web application development, MVC architecture, e-commerce, web services.

By Order,



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