

**SCHEME AND SYLLABUS OF EXAMINATION FOR THE PURPOSE OF FILLING UP THE POST OF ASSISTANT DIRECTOR UNDER SIKKIM STATE INFORMATION TECHNOLOGY SERVICE.**

The examination will consist of 2 papers:-

PAPERS	SUBJECT	FULL MARKS	TIME ALLOWED
PAPER-I	GENERAL ENGLISH & GENERAL KNOWLEDGE	150	2.30 HOURS
PAPER-II (MAINS)	COMPUTER SCIENCE & INFORMATION TECHNOLOGY	300	3.00 HOURS
	VIVA-VOCE / PERSONALITY - 50 MARKS		

**1. PAPER-I: GENERAL ENGLISH**

The question will be designed to test the candidate's understanding and command of the English language. Mode of Examination pattern shall be objective Conventional/MCQ for both Paper-I, General English-General Knowledge and Paper-II.

**ENGLISH**

Candidates will be required to answer questions designed to test their understanding of English and workman like use of words. The pattern of questions would be broadly as follows:

- 1) Comprehension of given passage.
- 2) Precise writing
- 3) Usages and Vocabulary
- 4) Short essay

**GENERAL KNOWLEDGE**

**General Knowledge:** Knowledge of current events of Local, National and International importance and of such matter of everyday observation and experience in their scientific aspects as may be expected of any educated person who has not made a special study of any scientific subject. The paper will also include questions on Modern History (From 1857 onwards) of India, Indian Culture, Indian Policy, Indian Economy & Geography of India of such natures as candidates should be able to answer without Special Study and questions on the techniques of Mahatma Gandhi. The questions will be of objective type.

**PAPER - I****1. English**

The syllabus for the same may be as per the SPSC guidelines.

**2. General Awareness and Aptitude**

The syllabus for the same may be as per the SPSC guidelines.



## **PAPER II (MAINS) - COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

### **Digital Logic:**

Logic functions, Minimization, Design and synthesis of combinational and sequential circuits; Number representation and computer arithmetic (fixed and floating point).

### **Computer Organization and Architecture:**

Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Instruction pipelining, Cache and main memory, Secondary storage.

### **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-and-conquer; 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.

### **Theory of Computation:**

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

### **Compiler Design:**

Lexical analysis, Parsing, Syntax directed translation, Runtime environments, Intermediate and target code generation, Basics of code optimization.

### **Operating System:**

Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

### **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. 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, digital signature, firewalls.

**State Data Centre:**

Systems & Security, Internal Networking, Firewall Concepts, Linux Operating System, Windows Operating System, Building Management System, Network Operation Centre.

**Model, View and Controller Architecture:**

**Concepts on UI/UX interface:**

**Programming Concepts using PHP, C#, Javascript etc.**

**Mobile Application Development concepts:**

Javascript, Android Studio, SWIFT Programming, Native programming, Hybrid Programming etc.