**10. COMPUTER SCIENCE**

**COMPUTER FUNDAMENTALS**

**Algorithms and flow charts:** Problem analysis, flow charts, the concept and properties of

algorithms, elementary algorithms development, algorithms evolving decision and loops.

Simple model of computer, Characteristics and generation of computers-Binary number

Codes and arithmetic: Binary, octal, hexadecimal number systems and their conversion from one

number system to another number system.

**Data Representation:** Data types, fixed and floatina point-representation. Description of I/O units,

memory organization: RAM, ROM, Cache memory, serial and random access memory, concept of

operating systems, Computer communication and network.

**Computer Based Numerical Methods & Fortran Programming:** Floating and normalized

floating point representation of numbers. Simulataneous linear equation: matrix inversion, Gauss-

Jordan and Gauss elemination method with pivoting and without pivoting. III conditioned,

equations refinement of solutions.

Numerical Intigration, numerical solutions of algebric equations, solutions of ordinary

differential equations.

**Fortran Programming:** Programming preliminaries constants and variables arithmetic etc.

**Logical Organisation of Computers:** Basic logic Design: Truth tables, Boolen algebra,

Combinational circuit design with AND, OR, NOT, NAND, NOR, XOR gates and multiplex ers. Flip

flops, shift registers and counters simple arithmetic and logic circuits.

**CPU Architecture, I/O Architecture:** I/O Channels and pheripheral processors.

**DATA AND FILE STRUCTURES**

**Operating Systems:** Operating system as resource manager, operating system services and

classification: single user, multi interactive and real time, processor management; memory

management, case study of DOS, Unix and Windows 95.

**Data Communication and Networks:** Concept of data transmission, Single encoding,

modulation methods, synchronization multiplexing and concentration, coding methods,

cryptography.

**Networks:** Local area networks (LAN) CSMA CD, token bus, token ring techniques. Link level

control (LLC) protocols, medium access control (MAC) protocol. Wide area networks (WAN).

**Object-Oriented Programming in C++:**

**Object-Oriented programming:** Pardigms and Metaphors: Active Data. Classes Encapsulation

and inheritance, Type of object oriented system.

Complex programming exercises in C++ involving functional decomposition and object

oriented design; use of templates, inheritance, virtual functions; graphics in C++; Windows

programming through Visual C++.

**General Science**

2. History of India including India’s struggle for freedom and post independence Indian polity.

3. Indian Economy and Culture

4. Population, Environment and Urbanisation in Indian Context.

5. World Geography including Geography of India.

6. Current events of National and International importance.

7. Analytical Ability of important current events and concerns.

8. Basic knowledge of Computer.

Question on General Science will cover general appreciation and understanding of Science

including matters of every day observation and experience, as may be expected of a well

educated person, who has not made a special study of any scientific discipline. In History

emphasis should be on broad understanding of social, economic and political aspects of Indian

history. In the Indian National Movement, the candidates are expected to have synoptic view of

the nature and character of the freedom movement, growth on nationalism and attainment of

Independence. In Indian Polity Economy and Culture, Questions will test Knowledge of country’s

political system including Panchayati Raj and community development broad features of economic

policy in India and Indian Culture. The candidates will be tested with respect to problems and

relationship between Population, Environment and Urbanisation. In world Geography, only general

understanding of the subject will be expected. Questions on the Geography of India will relate to

physical social and economic Geography of India. On Current Events of National and International

Importance, candidates- will be expected to have knowledge about them. Candidates are required

to have basic knowledge of computer Science, Management and Environmental Sciences. In

General, Mental Ability, questions will test comprehension, reasoning and numerical ability.

Candidates are expected to have general awareness about the above subjects with special

reference to Uttarakhand.