

Year 11 Study guide

Data representation: decimal, binary, hex and conversions. Signed, unsigned numbers. Two's complement. Minimum and maximum of a sequence of bits. ASCII, UNICODE. Overflow, underflow, right shift, left shift.

Operating systems: types of OSs: batch, real-time (critical and non-critical), multi-tasking, network OSs. Main OS functions: programs control, memory management, protection and security, user interfaces, file management. Scheduling algorithms. Resources (CPU, RAM, hard disk, video card etc. Sharable, non-sharable resource.

Data and files: direct and sequential access, data integrity, file generation (grandparent, parent and child files), data protection act

Architecture: RAM, ROM (bootstrap loader,), CPU, CU, ALU (instruction set, bandwidth, clock speed). Bus (address bus, data bus, control bus; width of buses). Cache, registers (CIR, PC, Accumulator, MDR, MAR). Fetch-decode-execute cycle. Buffer. Port, system clock, interface. Secondary storage: pen drive, hard disk, DVD, tape etc. screen (size, resolution, adjustability). KB, MB, GB, TB. GHz. CISC, RISC processors. RAM, read and write cycles, DRAM, SRAM. Device driver.

Computer logic: truth tables, gates, logic circuits, Boolean expressions.

Databases: relational database, data types, primary key, foreign key, queries, relationships (one-to-one and one-to-many), DBMS. Records (fixed-length and variable-length).

Software: system and application software. Utilities. Compiler, interpreter, assembler. Object code, source code. Main applications and their features, mail-merge, clipboard. Generation of languages: machine code, assembly, 3G (HLL), 4G.

I/O: validation methods, verification. Various input devices (OCR etc.)

Assembly language: label, opcode, branch instruction, operand

Networks: client-server, peer-to-peer. Misuse (viruses, etc.) and measures (antivirus etc.), modem, cables (twisted pair etc.). Videoconferencing,

System development life cycle: the stages (feasibility study, analysis etc.), information gathering (interviews etc.), changeover methods (parallel etc.), maintenance (corrective, perfective, preventive)

Java programming: flowcharts, pseudocode, Class, class diagram, variables, constants, types, declaration, statement, assignment statement, condition, Keyboard class, if..then..else, for loop, while loop, do-while loop. Constructors, parameters, the access modifiers private and public. API, IDE, debugger. Tests: dry run, unit testing, integration test, black box tests, white box tests. Errors (syntax, logic, run-time). Methods, parameters (formal parameters) and arguments (actual parameters), return value. Method definition (declaration), method call, methods signature. Arrays. Bytecode, JVM. Documentation (user documentation, program documentation, technical documentation).