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~~Section 1:~~ **Computer Science and Engineering Proficiency**
~~paper II~~

909(B)

~~810(B)~~
~~409(A)~~**Section 1:**

Digital Logic Boolean algebra. Combinational and sequential circuits. Minimization. Number representations and computer arithmetic (fixed and floating point).

Computer Organization and Architecture Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Section 2:

Programming and Data Structures Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Algorithms : Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, shortest paths.

Section 3:

Theory of Computation Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

Compiler Design Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation.

Section 4 :

Operating System :Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

Databases ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Section 5:

Computer Networks Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key

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VRET- 2018 Syllabus



Paper-I: Research Methodology

(Common for SoS of Engineering & Technology)

Note: Each section carries equal weightage

Section-I:

Research: Meaning, Characteristics, types, steps, methods, and ethics, Paper, article, workshop, seminar, conference and symposium

Thesis writing: Its characteristics and format

Section-II:

Mathematical reasoning: Number series, letter series, codes, relationships, classifications and data representation

Section-III:

Logical reasoning: Understanding the structure of arguments, evaluating and distinguishing deductive and inductive reasoning, verbal analogies: Word and applied analog, verbal classification, reasoning logical diagrams, simple diagrammatic relationships, multi-diagrammatic relationships, Venn diagram and Analytical reasoning

Section-IV:

Environment Awareness: People and environment interaction: Source of pollution, Pollutant and their impact on human life, exploitation of natural and energy resources, Natural hazards and mitigation

Current issues of national and international importance relating to social, economic and industrial development.

Ethics and values in engineering profession

Section-V:

Reading comprehension: A passage to be set with objective questions

Information and Communication Technologies (ICT) based tools and their applications in Engineering such as networking, e-governance and technology based education

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