AWADHESH PRATAP SINGH UNIVERSITY,REWA (M.P.)

Ph. D. (Computer Science) Entrance Syllabus

2022-23 Onwards

R.Kiratese

AWADHESH PRATAP SINGH UNIVERSITY, REWA

Ph.D. (Computer Science) Entrance Syllabus form the session 2022-23 and onwards

Max. Marks : 100

Min. Pass Marks: 50

Note: Both the parts **A** and **B** shall consist of 50 objective type compulsory questions. Each question carries one mark.

Part A: Research Methodology

1. **Research Aptitude:** Research: Meaning, characteristics and types; Steps of research; Methods of research; Research Ethics; Paper, article, workshop, seminar, conference and symposium; Thesis writing: its characteristics and format.

2. **Reasoning (Including Mathematical):** Number series: Letter series; Codes; Relationships; Classification.

3. **Logical Reasoning:** Understanding the structure of arguments; Evaluating and distinguishing deductive and inductive reasoning; Verbal analogies: Word analogy- applied analogy; Verbal classification; Reasoning logical diagrams: Simple diagrammatic relationship, multi-diagrammatic relationship; Venn diagram: Analytical reasoning.

4. **Data Interpretation:** Sources, acquisition and interpretation of data; Quantitative and qualitative data; Graphical representation and mapping of data.

5. **Information and Communication Technology (ICT):** Meaning, advantages, disadvantages and uses; General abbreviations and technology; Basic of internet and e-mailing.

6. **Introduction to research publication, similarity assessment and publication:** Impact Factor, Publication Journals, Plagiarism checking (Urkund & other software's), Introduction to Shodhganga, Inflibnet.

Part B: Computer Science

Unit-I Discrete Mathematics and Theory of Computation

Discrete Mathematics: Introduction to mathematical logic, identities and laws of logical implications and equivalences. Theory of Inference for statement calculus and predicate calculus, Elementary set theory, Relation and ordering, functions, introduction to algebraic structures, Lattices and Boolean algebra, Graph Theory

Theory of Computation: Automata theory, Mealy and Moore Machine CFG and CFL, and regular grammar, Pushdown automata and Turing Theory.

UNIT – II Programming methodology and Data structure

Algorithmic approach and flow chart designing. Algorithm analysis for time and space requirements, Concepts of OOPS, Virtual machine, Inheritance, Polymorphism, function overloading and overriding, Looping and control statements, Arrays and Pointer, String handling, File handling functions, Stack, queues and linked list, tree, binary tree, traversal algorithm, Binary Search trees, Graph and matrix representation of graph, sorting algorithms, hashing functions,

UNIT – III DBMS and Software Development

Basic Concepts of architecture of DBMS: Data independence, Schema, Sub Schema, Mapping, Physical and logical data, Basic File System, Data models, Relational algebra, Relational Calculus, Functional Dependency and Integrity Constraints, normal forms, Query Processing and Database query language (SQL), Query optimization strategies, Access Control and Concurrency control, serializibility, locking and database recovery, Client server databases and Knowledge databases, data mining and warehousing.

Software Engineering: SDLC Model, SRAS (Software requirement analysis and specification), Cost estimation, Project scheduling, Risk management, Software quality assurance, Software design process, Coding and testing.

UNIT – IV Computer System architecture and operating system

Basics of Computer Architecture: Basic computer organization, Basic building blocks of Computer (Combinational and sequential circuits, Registers, Counters, Memory organization, DMA), S/W model of 8086/88 microprocessors, instruction set of 8086/88 microprocessors. Introduction to SIC/XE machine architecture and object code generation, loaders and linkers, macro-processors. Introduction to compiler design, compiler design options.

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Introduction to operating systems: Operating system concepts and functions, types of operating system, Process concepts and CPU Scheduling algorithms, Inter-process synchronization and deadlock handling, Memory management techniques, Virtual memory and Page replacement algorithms, Disk Scheduling.

UNIT–V Computer graphics and multimedia and Computer

Network

Computer graphics and multimedia: Overview of graphics system and 2-D Transformation (Windowing and clipping),3-D transformation, viewing and modeling(Viewing transformation and hidden surface removal).Applications of multimedia, Compression format, MIDI, Video and image processing software, animation and its types, SMIL, ECMA script.

Computer Network : Basics of data Communication, OSI and TCP/IP Reference model, H/W and S/W requirements for Computer networking, functions of data link layer, IEEE standards for LAN and MAN,IP protocols and IP address, URL,DNS, SNMP, WWW, Routing and Congestion control algorithms, Network Security and cryptography.