

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF ANALYST-CUM-PROGRAMMER DEPARTMENT OF INFORMATION TECHNOLOGY AND COMMUNICATION

Paper - I

Reasoning Test & Numerical Analysis & General Knowledge

Problem solving, Data Interpretation, Data Sufficiency, Logical Reasoning and Analytical Reasoning. General Knowledge and Current Affairs relating to India and Rajasthan.

Data Base Management Systems

ER Diagram, data models- Relational and Object Oriented databases.

Data Base Design: Conceptual data base design, Normalization Primitive and Composite data types, concept of physical and logical databases, data abstraction and data independence, data aggregation and Relational Algebra. Application Development using SQL: Host Language interface, embedded SQL programming, Stored procedures and triggers and views, Constraints assertions.

Internal of RDBMS: Physical data organisation in sequential, indexed random and hashed files. Inverted and multilist structures, B trees, B+ trees, Query Optimisation, Join algorithm.

Transaction Processing, concurrency control and recovery management. Transaction model properties and state serialisability. Lock base protocols, two phase locking.

Different server multi user, multiprocess operating systems and requirement for client interfaces in distributed application environments.

Data Communication and Computer Networks

Computer Network Architecture, Circuit switching, Packet And Message Switching, Network Structure. Physical Layer, Data Link Layer, Framing. Retransmission algorithms.

Multiple access and Aloha. CSMA/CD and Ethernet. High Speed LANs and topologies. Broadcast routing and spanning trees.

TCP/IP Stack. IP Networks and Internet. DNS and Firewalls. Intrusion Detection and Prevention.

Transport layer and TCP/IP. Network Management And Interoperability.

Paper - II

System Analysis and Design

System concept: Definition and characteristics, elements and boundaries, types of system development lifecycle, recognition of needs, feasibility study, prototyping, role of system analyst. System planning and tools like DFD, data dictionary, decision trees, structured analysis and decision tables.

IPO charts, structured walkthrough, input output form design, requirement and classification of forms, layout considerations form control, object oriented Design Concepts and methods.

Software Life Cycle, Software Engineering paradigms. System analysis: Feasibility study requirement analysis, Cost benefit analysis, Planning systems, Analysis tools and techniques.

System Design: design fundamentals, Modular Design, Data and procedural design, object oriented design.

System Development: Code documentation, Program design paradigms, Efficiency Consideration. Verification, Validation and Testing: testing methods, Formal Program Verification, Testing Strategies.

Software Maintenance: Maintenance Characteristics, Maintainability, Maintenance tasks and side effects.

Software Project Management

Software Project Management Concept: The Management Spectrum, People, Product, Process & Project.

Software Process & Product Metrics: Software Measurement - Size Oriented Metrics, Function Oriented Metrics.

Software Project Planning: Objectives, Decomposition Techniques, Empirical Estimation Model. Risk Analysis and Management: Risk Identification, Projection, Risk Identification, Projection, Risk Refinement, Risk Monitoring And Management.

Project Scheduling & Tracking, Software Quality Assurance, Software Configuration Management.

Note : *Language of Question Paper will be English only.*

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Scheme of Competitive Examination :

- 1 A candidate must appear in all the papers. The marks and time allowed for each Paper shall be as under : -

Name of Papers	Marks	Time
Paper – I	100	2 Hours
Paper – II	100	2 Hours

Note : “**Minimum qualifying marks :** Candidates who obtain a minimum of 40% marks in the aggregate for the written examination/speed test shall be considered to have obtained qualifying marks at the written examination/speed test, as the case may be, but the minimum qualifying marks in the written examination/speed test for the candidates belonging to Scheduled Castes/Scheduled Tribes, shall be 36%. The Commission/Appointing Authority may in their/its discretion award grace marks upto one in each paper and upto three in the aggregate.”

- 2 Objective Type Paper.
- 3 All Questions carry equal marks.
- 4 There will be **Negative Marking**.

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