RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR COMPETITIVE EXAMINATION
FOR THE POST OF 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.

Data Communication and Computer Networks

Computer Network Architecture, Circuit switching, Packet And Massage 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.

Programming Concepts

Introduction: Internet, Java as a tool for internet applications, Byte Code and its advantages.

Object Oriented Programming and Design: Review of Abstraction, Objects and other basics, Encapsulation, Information hiding, Method, Signature, Classes and Instances, Polymorphism, Inheritance, Exceptions and Exception Handling with reference to object modeling, Coupling and Cohesion in object oriented software. Object Oriented Design – Process, Exploration and Analysis.

Java Programming Basics: Variables and assignments, Input and Output, Data Types and Expressions, Flow of control, Local variables, Overloading Parameter passing, this pointer, Java Object Oriented Concepts: Use of file for I/O, Formatting output with stream

functions, Character I/O, Inheritance, Public and private members, Constructors for initializations, Derived classes, Flow of Control Arrays-Programming with arrays, arrays of classes, arrays as function arguments, Strings, Multidimensional arrays, Arrays of strings, vectors, Base classes.

Introduction to JSP, RMI, Java Applets and servlets.
Introduction to DotNet framework and visual programming interface.

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S. No.	Subject	No. of Questions	Total Marks	Examination Duration
	Scheme of Examination			
	A candidate must appear in all the papers.			
1	Paper-I	100	100	2.00 Hours
2	Paper-II	100	100	2.00 Hours
	Total	200	200	

1. The competitive examination will consist two papers. Each paper will carry 100 marks and 100 questions of Multiple Choice Type questions.
2. There shall be two paper. Duration of each Paper will be Two hours.
3. Negative marking shall be applicable in the evaluation of answers. For every wrong answer one-third part of the marks prescribed for that particular question shall be deducted.
   Explanation :- Wrong answer shall mean an incorrect answer or multiple answers.

उक्त पद हेतु आयोजित की जाने वाली परीक्षा के लिए ओ.एम.आर. उत्तरपत्रक में प्रश्नों के विकल्प भरने के संबंध में विशेष निर्देशः—

1. Each question has five options marked as 1, 2, 3, 4, 5. You have to darken only one circle (bubble) indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.
2. It is mandatory to fill one option for each question.
3. If you are not attempting a question then you have to darken the circle '5'. If none of the five circles is darkened, one third (1/3) part of the marks of question shall be deducted.
4. After solving question paper, candidate must ascertain that he/she has darkened one of the circles (bubbles) for each of the questions. Extra time of 10 minutes beyond scheduled time, is provided for this.
   A candidate who has not darkened any of the five circles in more than 10% questions shall be disqualified.