

SUBJECTIVE TYPE IT PROFICIENCY TEST

Max Marks: 100

Qualifying Standard 50%

Time Allowed: 3 Hours

Case No.	F.4-258/2019-R
Particulars of post	Assistant Manager IT (BS-17) Intelligence Bureau
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' Master's degree or equivalent in Computer Science. OR Second Class or Grade 'C' Bachelor's degree in Software Engineering or System Engineering/ Computer Engineering.</p> <p>ii. Certification in MTA (Microsoft Technology Associate) OR CCNA (CISCO Certified Network Associate) OR RHCSA (Red Hat Certified System Administrator) OR The officer will be required to qualify certification in either of the above during probation period.</p>

I. Introduction to Computing

Introduction to Information Technology and Computers, History of Computing, Computer HW and SW Details, Computer System Components and Communication System, Input & Output devices and their types, Storage Media and their types, Types of Computer Hardware, Information Security/Privacy, Computer Crimes and Ethical Challenges, Trees (Binary Trees, Binary Search trees, AVL Trees, Encryption Algorithms (DES, RSA), Design Concepts, Architectural Design, Design & Implementation, Project Management, Machine Instruction Characteristics, Instruction Processing, Processor Structure & Function, Control Unit Operation, Micro-programmed Control, Instruction-Level Parallelism And Superscalar Processors, Parallel Processing, Multi-Processor and Multi-core Systems.

II. Computer Communications & Networks

Basic Concepts and Classification of Networks, Circuit switching, Packet switching, Multiplexing (TDM, FDM), Layering: OSI and TCP/IP, Application Layer (Network application architectures, HTTP, FTP, Email, DNS, P2P applications), Transport Layer (Multiplexing in UDP and TCP, Connectionless Transport: UDP, Reliable data transfer and TCP, Congestion avoidance and control), Network Layer (The Internet Protocol, IPv4 Datagram, Internet Address Classes, Special IP Addresses ARP, IPv6, ICMP, Network Address Translation (NAT), Internet Routing Protocols and Algorithms, X.25, Frame relay and ATM, MPLS), Physical & Link Layer Functionalities (Error Detection & Control, ARQ, Link layer addressing, LAN Technologies, Bridges and Hubs, Multiple Access), Special topics (Security, Overlay networks, naming, Content distribution networks, Peer to peer systems, DHTs, Network Attacks).

III. Database Systems

Introduction to Database Systems, Relational Data Model & Relational Database Constraints, Relational Data Model, SQL, Relational Algebra & Calculus, ER Model, ER to Relational Mapping, PL/SQL Stored Procedures & Triggers, Functional Dependencies and Normalization, Storage & Indexing, Indexing Structure, XML documents & Web Services, Query Processing & Evaluation, Query Optimization, Transaction processing, Object-Oriented Databases, Distributed Databases, Database Security & Access Control

IV. Operating Systems & Web

Roles of an Operating System, Operating-System Evolution, Memory Management, File Systems (UNIX and Windows Systems), Web applications Issues (Accessibility, testing, performance, operation, maintenance, security).

SUGGESTED READINGS

S. No.	Title	Author
1.	Computer System Architecture	M. Morris Mano
2.	Software Engineering	Ian Sommerville
3.	Computer Networking: A Top Down approach featuring the Internet	James F. Kurose and Keith W. Ross
4.	Data and Computer Communications	William Stallings
5.	Database Systems Concepts	Silberchatz, Abraham & Korth, Sudarshan
6.	Computer Networks	Andrew Tanenbaum
7.	Web Services: Principles and Technology	Michael Papazoglu