नेपाल बैंक लिमिटेड

तह ७, उप प्रबन्धक (IT) पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

पाठ्यक्रमको योजनालाई निम्नानुसार दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा — पूर्णाङ्क :- २००

द्वितीय चरण :- अन्तर्वार्ता — पूर्णाङ्क :- ३०

परीक्षा योजना (Examination Scheme)

प्रथम चरण :- लिखित परीक्षा (Written Examination)

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्नसंख्या x अङ्क	समय
प्रथम	Banking, Management, General IT and Service Related	१००	४०	विषयगत	छोटो उत्तर आउने प्रश्न	४ प्रश्न x ५ अङ्क	३ घण्टा
					लामो उत्तर आउने प्रश्न	८ प्रश्न x १० अङ्क	
द्वितीय	Information Technology	१००	४०	विषयगत	छोटो उत्तर आउने प्रश्न	४ प्रश्न x ५ अङ्क	३ घण्टा
					लामो उत्तर आउने प्रश्न	८ प्रश्न x १० अङ्क	

द्वितीय चरण :- अन्तर्वार्ता (Interview)

विषय	पूर्णाङ्क	परीक्षा प्रणाली
अन्तर्वार्ता	३०	मौखिक

द्रष्टव्य :

१. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।

२. लिखित परीक्षामा सोधिने प्रश्नसंख्या र अङ्कभार यथासम्भव सम्बन्धित पत्र/विषयमा दिईए अनुसार हुनेछ ।

३. विषयगत प्रश्नहरुको हकमा एउटा लामो प्रश्न वा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरु (Short notes) सोध्न सकिने छ ।

४. विषयगत प्रश्न हुने पत्र/विषयका प्रत्येक भाग/खण्ड/एकाइ/प्रश्नका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरु हुनेछन् । परिक्षार्थीले प्रत्येक भाग/खण्ड/एकाइ/प्रश्नका प्रश्नको उत्तर सोही भाग/खण्ड/एकाई/प्रश्नको उत्तरपुस्तिकामा लेख्नुपर्नेछ ।

५. यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जुन सुकै कुरा लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरु परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्क्रममा परेको सम्झनु पर्दछ ।

६. प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरुलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।

७. पाठ्यक्रम स्वीकृत मिति :–२०८१/१२/१४

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तह ७, उप प्रबन्धक (IT) पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

प्रथम पत्र :

Banking Management, General IT and Service Related

खण्ड (क): (२ प्रश्न × ५ अङ्क + ४ प्रश्न × १० अङ्क = ५०)

1. Banking and Management

1.1 Concept of banking and its development
1.2 Functions of commercial banks
1.3 Types of deposit and their mobilization
1.4 Perception and its determinants
1.5 Motivation and its principles
1.6 Group dynamics & team work and its implications
1.7 Communication: concepts, modes and importance
1.8 Problem solving and decision making process
1.9 Time management, stress management
1.10 Compliance Reports - NRB, Basel-III, Credit Information Centre (CIC)
1.11 Bank and Financial Institution Act, 2073
1.12 Nepal Rastra Bank Act, 2058
1.13 Banking Offence and Punishment Act, 2064

खण्ड (ख): (२ प्रश्न × ५ अङ्क + ४ प्रश्न × १० अङ्क = ५०)

2. General IT and Service Related

2.1 Electronic Transaction Act, 2063
2.2 Cybersecurity Policy, 2080
2.3 NRB IT Policy
2.4 IT Planning in Banking
2.5 IT Service Management and its challenges
2.6 IT System Risks in Banking and Financial System
2.7 Cyber Crime and Code of Conduct, Legal Issues in Cyber Crime
2.8 Digital Certificate and Digital Signature
2.9 Ethics in Cybersecurity & Cyber Law
2.10 Troubleshooting and Maintenance in Bank's ICT System
2.11 Role of ICT in the Development of Banking and Financial System in Nepal
2.12 Business Continuity Planning and Disaster Recovery System for Banks
2.13 Impacts of Technology on Individual, Group and Society
2.14 Proper use of ICT for Rationale Decision Making (Decision Support System)
2.15 Electronic Fund Transfer (Web Remittance)

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तह ७, उप प्रबन्धक (IT) पदको खुला प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र: Information Technology

खण्ड (क): (२ प्रश्न × ५ अङ्क + ५ प्रश्न × १० अङ्क = ६०)

1. Computer Hardware and Operating System

1.1 Computer Arithmetic: Arithmetic and Logic Unit, Integer Arithmetic and Representation, Floating-Point Arithmetic; Input Output Organization: I/O programming, Memory Mapped I/O, Basic Interrupt System, DMA; Processing Unit: Instruction Formats, Arithmetic and Logical Instruction, Addressing Modes and Formats; Memory Systems: Internal Memory, Cache Memory, Direct Memory Access, External Memory

1.2 Definition, Development and Functions of Operating System (OS), Functional Architecture of OS, Types of OS, Network and distributed OS; Processes and Threads: Symmetric Multiprocessing, Micro-kernels, Concurrency, Mutual Exclusion and Synchronization, Inter Process Communications, Semaphores. Features of Process Scheduling; Inter-Process Communication and Deadlock scheduling; Parallel and Distributed Processing; Disk Allocation and Scheduling Methods, Basic Memory Management strategies, Virtual Memory Management Techniques, Process and features of the Process Management System; Distributed Systems: Distributed Message passing, RPC, Client/Server Computing, Cluster computing

2. Database Management System and Design

2.1 SQL and Embedded SQL, DDL, DML, DCL; SQL middleware basics: SQL API, Open SQL Gateway

2.2 Restricting and Sorting Data Sub Queries, Manipulating Data and Creating &Managing Tables, Creating Views and Controlling User Access, Date time Function, Relational Database Design, ER Diagram, Keys (primary, foreign, candidate, alternate keys); Normalizations (1NF, 2NF, 3NF, BCNF)

2.3 Crash Recovery: Types of failure, Recovery techniques, Query Processing and Optimization; Indexing: Hash based indexing, Tree based indexing; Distributed Database Systems and Object-oriented database system

2.4 Basic Concept of major RDBMS products (MSSQL, Oracle, MariaDB) and basic concept of NOSQL

3. Computer Networks

3.1 OSI & TCP/IP reference model, Topologies, Client/Server Model & Peer2Peer Model, Network Components: Repeater, Hub, Bridge, Switch, and Router

3.2 Link Layer: Services, Flow and Error Control, error detection and correction, multiple access protocols (ALOHA, Slotted ALOHA), Ethernet CSMA/CD, Token Bus, Token Ring, FDDI, Protocols: PPP, HDLC, Virtual circuit switching: Frame relay, ATM, X.25, MPLS,

3.3 Network Layer: services, datagram and virtual circuits, routing principles and algorithms, Internet Protocols (IPv4/v6) header format, IPv4/v6 addressing and

subnetting, VLSM, CIDR, ICMPv4/v6 error/information messages, Routing: interior/exterior routing, unicast/multicast routing, adaptive/non-adaptive routing. Routing protocols: RIP, OSPF, BGP, IS-IS

3.4 Transport Layer: Services, multiplexing and De-multiplexing, UDP, TCP, flow control, TCP sliding window, principles of congestion control, TCP congestion control, Open/close loop congestion control, Leaky bucket & Token Bucket algorithm, overview of socket programming, TCP/UDP Sockets 5.6. Upper layers: Application, presentation and session layer functionalizes, principles of WWW, DNS, DHCP, FTP, email protocols: SMTP/PoP/IMAP, PGP

3.5 Network management: Server concepts-Proxy/web/DNS servers, IP interconnection, Tier ISP architecture, VoIP, FoIP, remote login (telnet, ssh), Traffic monitoring (MRTG, bandwidth, throughput, latency/delay)

3.6 Advanced Data Storage Techniques: Network Attached Storage, Storage Area Networks

3.7 Latest networking: Software-Defined Networking, Software-Defined IPv6 (SoDIP6) Network, IPv6 network migration methods, SDN migration methods, IoT, WSN, NGN

खण्ड (ख): (२ प्रश्न × ५ अङ्क + ३ प्रश्न × १० अङ्क = ४०)

4. Software Engineering and SAD

4.1 Software process: The software lifecycle models, risk-driven approaches

4.2 Software Project management: Relationship to lifecycle, project planning, project control, project organization, risk management, cost models, configuration management, version control, quality assurance, metrics

4.3 Software requirements: Requirements analysis, requirements solicitation, analysis tools, requirements definition, requirements specification, static and dynamic specifications, requirements review

4.4 Software design: Design for reuse, design for change, design notations, design evaluation and validation

4.5 Software Project Implementation: Programming standards and procedures, modularity, data abstraction, static analysis, unit testing, integration testing, regression testing, tools for testing, fault tolerance

4.6 Software Maintenance: The maintenance problem, the nature of maintenance, planning for maintenance

4.7 Tools and environments for software engineering, role of programming paradigm, process maturity and Improvement, ISO standards, SEI-CMM, CASE tools

4.8 Fundamentals of Object-oriented system analysis and design Context Diagram, Data Flow Diagrams (DFDs), UML diagrams

5. Banking and Emerging Technologies

5.1 Ecommerce: Reverse Engineering, E-Banking, EDI Methods, SWIFT, card and delivery channels, ATM Switch

5.2 Artificial Intelligence: Introduction, Logic and Reasoning, Natural Language Processing and ANN; Machine Learning and pattern recognition

5.3 Cloud Computing: Cloud, Fog, Edge computing comparisons, Cloud Federation, Data Storage and Security in the Cloud; Virtualization: virtual machines, container technologies and dockers

5.4 Virtual Currency: History, Development, Models, Risks and Benefits, Initial Coin Offering, cryptography, digital signature, hashing; Blockchain: types, consensus mechanism, smart contracts, Decentralized finance: Transactions, Fungible and non-fungible tokens, custody, supply adjustment, swap, collateralized and uncollateralized loans

5.5 MIS and Web Engineering: Web engine architecture, Database Design issues; Data Mining and Data Warehousing: Introduction, Data models, classification, clustering, pattern analysis, social media analysis; Knowledge Management, Work Process Redesign (Reengineering) with Information Technology; Enterprise Resources Planning Systems, and Global Information Technology issues, Group Decision Support Systems

5.6 Blockchain Technology: Introduction to blockchain, block structure, characteristics of blockchain, benefits of blockchain, basic working mechanism of blockchain; Types of blockchain: Distributed, centralized and decentralized computing, permissioned vs. permission-less blockchain; Prolification of blockchain technology, Initial Coin offering; Consensus Mechanism: PoW, PoS, Hybrid, dBFT, and proof of Concept

5.7 Decentralized Finance (DeFi): Introduction, History, Key Issues in DeFi and Advantages over transactional approach. Blockchain as DeFi Infrastructure: Blockchain, Cryptocurrency, the smart contract platform, oracles, stable coins, Decentralized applications. DeFi primitives: Transactions, Fungible and non-fungible tokens, custody, supply adjustment, swap, collateralized and uncollateralized loans; DeFi applications: Credit Lending, Decentralized access, Derivatives, Tokenization