

लोक सेवा आयोग
नेपाल राष्ट्र बैंक, प्राविधिक, सूचना प्रविधि, अधिकृत तृतीय, सहायक निर्देशक (IT/Cyber Security)
पदको खुला प्रतियोगितात्मक लिखित परीक्षा
२०७९।०९।२६

पत्र : प्रथम
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : Information Technology - I

Section 'A' : Subjective

Time : 2 hrs 30 mins

70 Marks

1. Explain overlapped register window of RISC CPU with a required diagram. 5
2. Illustrate the difference between D and T flip-flop with its characteristic equations. 5
3. What do you mean by disk allocation and scheduling in an operating system? Describe Round Robin scheduling algorithm. 3+2=5
4. Explain ACID property of transaction in DBMS. 5
5. Differentiate between client/server model and peer to peer model. 5
6. What do you understand by client server computing? Discuss about distributed object based communication "CORBA". 2+3=5
7. Differentiate between FinTech and SupTech. What are the benefits of RegTech? 2+3=5
8. What are the privileges and facilities entitled to Nepal Rastra Bank according to NRB Act, 2058? 5
9. Explain the differences among Short-term, Medium-term and Long-term scheduling with examples. 10
10. Answer the following: 5+5=10
 - a) What are the steps involved in query processing? Explain the significance of materialized views.
 - b) Briefly describe two phase locking protocol for Concurrency Control.
11. How does Border Gateway Protocol work? Explain IPv6 network migration methods. 4+6=10

- The End -

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पत्र : द्वितीय
समय : ३ घण्टा

पूर्णाङ्क : १००

विषय : Information Technology - II

Section 'A' : Subjective

Time : 2 hrs 30 mins

70 Marks

1. Differentiate between procedural and object-oriented programming. 5
2. Explain the binary tree traversal techniques with examples. 5
3. What is Push Down Automata (PDA)? List down three components of PDA. 3+2=5
4. What does it mean by cohesion and coupling in object-oriented system design? Explain 3 types of cohesion and coupling with suitable examples. 2+3=5
5. Briefly explain various risk factors involved in software development. 5
6. Explain the core components under Android application architecture. 5
7. Write in brief about hierarchical modeling and its use in computer graphics. 5
8. Provide a brief description of E-Government Life Cycle. 5
9. Compare and contrast Service Oriented Architecture and Micro Service Architecture. 10
10. Explain the various phases of Software Development Life Cycle (SDLC) in brief. 10
11. Describe the existing eco-system of electronic payment system in Nepal. 10

- The End -

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२०७९।०९।२८

पत्र : तृतीय
समय : ३ घण्टा

पूर्णाङ्क : १००

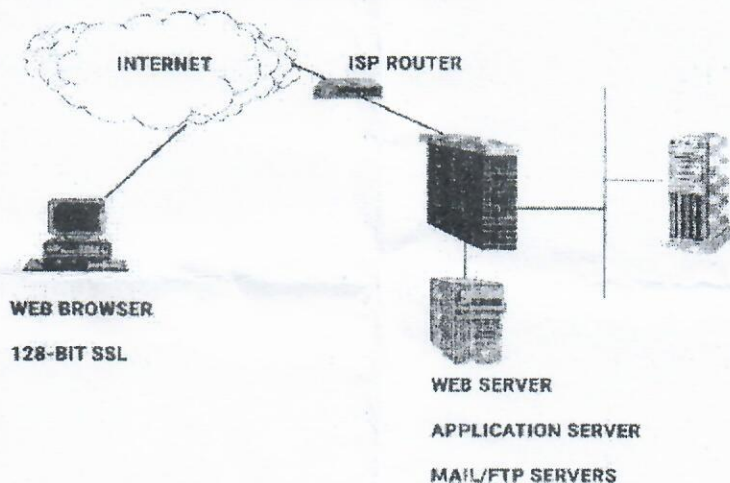
विषय : IT Security

Section 'A' : Subjective

Time : 2 hrs 30 mins

70 Marks

1. Explain cyber security NIST framework and five key functions for the protection of Digital assets. 3+2=5
2. Define Intrusion Detection System (IDS). Mention the types, characteristics and role of IDS in Network management and control. 1+2+2=5
3. What are some common types of attacks that can be launched against a web application? 5
4. Explain the difference between Firewall and VPN. 5
5. Explain in detail the difference between Block Cipher and Stream Cipher. 5
6. What are the advantages and disadvantages of ethical hacking? 5
7. Identify the difference between a vulnerability and an exploit. What are salted hashes? 3+2=5
8. What steps would you perform in identifying IT/IS related risks in Risk Identification State of IS risk management? 5
9. ABC Technology environment is illustrated below.



Other attributes of ABC's technology environment include the following:

- Firewall is Cisco® Adaptive Security Appliance (ASA).

प्राविधिक, सूचना प्रविधि, अधिकृत तृतीय, सहायक निर्देशक (IT/Cyber Security) - 2

- Web server and application server are hosted on Windows® Server® environments.
- Database server is Microsoft® SQL Server® 2014 hosted on a Windows Server.
- There are no configuration standards for operating systems or hosted services.
- Server builds are based on the initial install.
- Patches are implemented on a quarterly basis.
- No intrusion detection system (IDS)/intrusion prevention system (IPS) or security information and event management (SIEM) is implemented.
- No security assessment or penetration test has been undertaken for network infrastructure or the web application.
- The database server includes customer master information, customer transaction data, sales order data, inventory data, pricing information and sales leads.

Summary of Firewall Rules		
Source	Destination	Services Allowed
Internet	Web/Application DMZ	Mail, HTTP, HTTPS, FTP, SSH
Internet	Database DMZ	None
Web/Application DMZ	Database DMZ	SQL Server, SSH, FTP

Based on the presented scenario, write down the key risks relevant to Company ABC and the vulnerabilities that are present that may allow cyber threat events to occur.

5+5=10

10. Explain digital signature algorithm. Describe elliptical curve cryptography.

5+5=10

11. What is information security policy? Explain how it can be beneficial for an organization.

10

- The End -