প্রশ্ন যদি সবার একই হয় তাহলে এই সিলেবাসে পড়লেই হবে।
এই সাজেশন্সটি মূল সাজেশন্স, সিএসই/আইটি, বুয়েট প্যাটার্ন

BUET Pattern- NPCBL Engineer (Software/Programming)

SL	Subject	Details Syllabus for BUET Pattern
Exam-01	C Programming, OOP Output problem, Conceptual problem	1-D array, 2-D array, pointer, call by reference & call by value, array reverse, leap year check, series related problem, pattern related problem, Fibonacci series, palindrome number, prime number, Armstrong number, String related problem, string compare, reverse, number division, separation of digiti, summation of digit, transpose of matrix, matrix sum, multiplication, find highest lowest value, file related problem like append, adding two sorted or unsorted arrays, sorting an array, find/duplicate specific word/number or digit, perfect number, Recursion Problem, Problem of quadratic equation, value replace in c, removing character/string from a string. Binary Search, Linear Search, Merge Sort, Quicksort, Radix Sort, Bubble Sort, check odd-even number, Which language is interpreted or compiled Output: indiabix, examveda, geeksforgeeks, tutorialspoint, javatpoint, gate cs. (https://gateoverflow.in/) Inheritance, Abstraction, Polymorphism, Function Overloading, overriding, Late binding, dynamic binding, Java interface, Extends Runnable, Java Inheritance problem, Java variable instance, Java Lamda Expression, Functional Interface in Java, Object initialization Practice: calculation of electricity bill, gas bill or others bill, tax return, salary calculation etc
2	HTML, CSS, JavaScript, regarding these and related with job exam	HTML head, body, meta, heading, hyperlink practice, Paragraph, CSS inline or external, basic functionalities like == & ===; validate a number/email/phone or checking password, PHP how to connect with database, making a webform, pass data with the form and insert into database. Registration, Login Practice, Json.
3	Computer Fundamentals,	**Computer Fundamentals:**

	Computer Architecture, Microprocessor & Microcontroller & Basic hardware related issues that is important for job exam.	SRAM, DRAM, Memory hierarchy, CPU Function, Virtual Memory & Cache memory, some troubleshooting related problem like laptop overheating, blue screen problem, Peripherals and various port name, printer & its types, windows restoring, motherboard, SSD interfacing, Printer Driver, Device Driver, **Computer Architecture:** Write back cache & write through cache, Hazard in computer arch & its types, Memory Operations, Flash RAM & static RAM, Blank Memory, Categories of Computer Architecture, Share memory and parallel processing architecture, RAID, Von Neuman & Harvard Architecture, RAID all. Pipelining mechanism and its advantages, Branching, five stages of pipeline CISC & RISC processor, BIOS & UEFI, Loader & Firmware, Mathematical Problem: Speed of processor, cache hit, miss related math, CPI Calculations. Direct Mapping & overhead calculation. Find average access time. **Microprocessor:** Microprocessor & Microcontroller advantages & difference. Timing diagram while reading data from memory. Microprocessor activities fetch and execution cycle. Pentium superscalar processor. 8,16,32,64-bit microprocessor. Multiprogramming & uni processor concept. 8086 microprocessor drawing and explanation of various parts. Interrupts & DMA. Assembly code practice like print 1 to n, sum of two number etc. Address bus Data Bus etc. Addressing Modes
4	Database	Distributed DBMS, DDL, DML, views, truncate, Various Key, ACID Properties, relational database, Degree of relationship, confidential, integrity, Functional Dependency, ER Diagram symbol and Drawing, Indexing, B+ tree, B-tree, Hashing techniques, Basic to advance SQL query, trigger, View, Procedure, SQL Function, Join, Create, Update, Delete. Transaction, Relational Algebra.

5	Operating System	OS Definition, Functions, Multitasking, multiprocessing, multi-programming, multi-threading, mount point in linux, thrashing, Open Source, 32-bit & 64-bit, Process, Threads, PCB, Fork, State of Process, Symmetric & Assymmetric Deadlock, Deadlock conditions, Resource Allocation, 4 Conditions Paging, Segmentation, small Page Size in memory, Demand Paging, Page Fault, Virtual MemoryPage Replacement Algorithm, FIFO, LIFO, LRU, Scheduling Algorithms: FCFS, SJF, Round Robin, SRTF, Priority Scheduling, Preemptive, Nonpreemptive, Semaphore, Kernel, Micro, Macro Kernel, Shell vs Kernel, Linux Commands & shell Scripts, Mathematical Problem regarding page fault, logical address, physical address, processor, page size.
6	Networking	Circuit Switching, Packet Switching, Cell Switching, WiMAX, Network Topologies, Flooding, Forwarding, Ethernet, IPv6, IPv4, Gateway, Router, Switch, Hub, Firewall, Multicast, Broadcast, Fiber Cable Slicing, Twisted pair cable, Private IP & Public IP OSI Layer, OSI Layer Protocol, TCP, UDP, Distance Vector, DNS, FTP, CSMA, OSPF, RIP etc, MAC flood in switch, backbone, Wi-Fi, Bluetooth, WiMAX, LAN, WAN, MAN, TCP/UDP, Connection & Connection Oriented, TCP Congestion control protocol,3 Way handshaking protocol, TCP/IP. DHCP, NAT, SMTP, DNS, DNS Server, DHCP Server, HTTP, ARP, I2C, SPI, https vs http, DHCP starvation IP Subnetting, VLSM, Internet Cookies, MAC flood in switch, stateless & stateful IP addressing, risk, threat and vulnerability, DNS Poisoning, online and offline UPS, Proxy Server, NMS, WAF, OCR, MICR, TDM, FDM, Serial Communication, ARP, RARP,
		Binary Systems and Number Conversion: Binary-Decimal-Octal-Hexadecimal Conversion Gray Code, Excess-3, Parity Code **Boolean Algebra and Logic Gates**

		Full Adder, Half Adder, 3-bit adder, X-OR, AND gates, Multiply bit,Sum of product, product of sum, universal gate, Basic gates Or, AND, XOR, NAN, NOR, ALU Design, **Simplifications of Boolean Functions** K-map, (3 variable & 4 variable), F =A , F =A+B, A = A+B', F= A-1 এর জন্য ALU Design, Simply Boolean Expression, SOP, POS, Decoder, Encode Design, Prime implicants, **Combinational Logic** 4*1 MUX, 4/16 line decoder from 2/4 line decoder, 8*1 multiplexer, 6*1 MUX by using 2*1 MUX, 3 input NAND Gate using 4*1 MUX, 2*4 decoder using basic gates, 3-8 decoder using 2-4 decoders. **Sequential Logic, Flip Flop** Design a Down Counter, Design an asynchronous counter using any flip flop. latch and flip flop, describe synchronous sequential circuits, D-Flip Flop into T-FF adding logic circuits, state diagram of a digital circuit, **Counter, Registers & clock** mod-6 counter using T Flip-flops, logic diagram of MOD-12 Up counter using only T FF, convert a 100 MHz clock to 50 MHz and 25 MHz by only using D flip-flops? four type of Register
8	Software Engineering	SDLC, Software maintenance life cycle, Steps of Physibility Study, Waterfall Model, Agile Model, Protype Model, SCRUM Model, Spiral Model. UML Diagram, Use Case diagram, Class Diagram, Satte Diagram. Design Pattern: MVC, Observer Pattern, Singleton Design Pattern, Strategy design pattern, Software Testing: Cohesion & Coupling, Unit Testing, Acceptance Testing, Black Box, White box, Gray Box Testing, Regression Testing, Alpha testing, Beta testing, Gamma Equivalence Partitioning, Smoke Testing, Boundary Value Analysis. Functional, Non-functional Testing. Pert Chart, Critical Path, Decision tree build, buy & customize, Reason for failure of a software project. Software Validation & Verification, Application framework, DSS, MIS, Git, Docker, UI/UX design, Socket, Get, Post, DFS, Microservice Architecture, Defect removal efficiency
9	Compiler Design, Theory of Computation, Machine	NFA, DFA, NFA vs DFA, Regular Expression, Context Free Grammer, Turing Machine.

	Learning, Artificial Intelligence, Big Data, Cloud Computing	Compiler Design Basic, Lexical Analyzer, Token,Code Optimization, Eliminate left, right empty string recursion, Syntax analysis and Semantic analysis A* Search, RBFS, IDA* Algorithm, First Order Logic,Hybridization of local and global search, Adversarial search, Turing Machine, OTDR, LSTM gates, PEAS, Agent, Approximate value & heuristic value. Supervised Learning, Unsupervised Learning, Test set and validation set, Strong and Ensemble learning, one layer two output ANN, Reinforcement learning, decision tree, Overfitting problem. Cloud Computing definition, types and real-life example. Definition of Big Data and uses.
10	Computer Security, Cyber Security, Information Security,	Basics of Computer/Network Security: Computer Virus, Antivirus Digital Signature, Encryption, Decryption, Cyber-attack, Cryptography: Symmetric and Asymmetric Cryptography & Example Symmetric key cryptographic algorithm, Computer attack/Virus, Patch and Update, Phishing attack, ARP Spoofing, Man in the Middle attack, Rootkit, Bootkit, Rootkit, Worm, Malware, Spyware, Threats, Ransomware attack, Active attack & Passive attack Network Security: Https and http, MAC Flooding, DNS Poisoning attack etc Firewall & DMZ, Firewall basic and types, Non-Repudiation, DMZ etc, Server-Side Security:Black listing, White listing, gray listing,VPN, DDOS attack in web server, server side attack & client side attack name Sha-256, Sha-512;Others: DHCP starvation, Cyber vandalism, biometric security, Trojan horse, Hellman Key exchange algorithm, RSA Algorithm, Packet sniffing and spoofing, Cross site script, Buffer overflow attack, SQL Injection attack, Social Engineering

11	Algorithm Analysis, Data Structure,	Implement stack using linked list, implement queue using linked list, Enqueue & dequeue operation,Array insert delete update, Linked list: insert, delete, update, reverse, traverse, Queue: insert, delete, Stack Push, Pop, Cirulcar & doubly Linked List, Circular queue, algorithm to multiply the matrix, Merge two sorted linked list, BST, Prim's , Kruskal Algorithm. MST, In order, preorder, post order traversal, heap, binary tree, binary tree repsentation using array.Graph adjacency matrix, dijsktra algorithm, Binary search, linear search, complexities of various searching & sorting Algorithm, Recursive & Recursion, Radix Sort, Quicksort, Shell Sort, Bubble Sort, Insertion sort, Selection Sort, Merge Sort, Infix & Postfix notation, B+ tree, B tree Greedy algorithm, Dynamic Programming, matrix multiplications, Divide and Conquer Algorithm, Huffman Coding, DFS, BFS, Dijkstra algorithm, Bellman Ford, Floyad Warshell Algorithm, P, NP, NP hard, Np Complete
12	Discrete Mathematics, Basic Electrical, Communication:	Discrete Math: Pigeonhole principle, Recurrence Relation Basic Electrical, Circuit Solution, Thevenin, Norton, Mesh, Superposition, Nodal analysis Communication: sampling, What is AWGN, quantizing error, PCM & Delta PCM, CDMA, communication channel, single mode and multi-mode fibre, dimmer using a Triac, seven segment display, Modulation and Demodulation, data communication, guided and unguided media, simplex, half duplex and full duplex, ADC steps? What is quantization error, Nyquist sampling theorem, the numeral aperture of optical fibre, Amplitude Modulation given Find Modulation Index, Signal to noise ratio, bit rate, baud rate calculation, working principle of optical fiber, total power and carrier frequency, STS, STM, Delta modulation and Demodulation, AM, FM, Bit Error Rate, SNR


CSE
CSE CAREER
MASTER GUIDE
LEARN • BUILD • GROW • SUCCEED

প্রশ্ন যদি ডোমেইন বেসড হয় তাহলে মূল সিলেবাসের সাথে এই টপিক জোর দিয়ে পড়তে হবে।

Engineer (Cyber Security), NPCBL
Cyber Security Job Exam Suggestions

1. Cyber Security Basics
- Cyber Security কী?
- CIA Triad
  - ✓ Confidentiality
  - ✓ Integrity
  - ✓ Availability
- Authentication vs Authorization
- Accountability
- Non-Repudiation
- Risk, Threat, Vulnerability, Exploit
- Attack Surface

গুরুত্বপূর্ণ প্রশ্ন
- Threat ও Vulnerability এর পার্থক্য কী?
- CIA Triad ব্যাখ্যা কর।
- Authentication ও Authorization এর মধ্যে পার্থক্য লিখ।

2. Information Security
Security Principles
- Least Privilege
- Need to Know
- Separation of Duties
- Defense in Depth

Security Controls
- Administrative Control
- Technical Control
- Physical Control

Data Classification
- Public
- Internal
- Confidential
- Restricted

3. Common Cyber Attacks
Malware Attacks
- Virus
- Worm
- Trojan Horse
- Spyware
- Adware
- Rootkit
- Keylogger
- Ransomware
- Botnet

Important Questions
- Virus ও Worm এর মধ্যে পার্থক্য কী?
- Trojan কীভাবে কাজ করে?
- Ransomware থেকে রক্ষা পাওয়ার উপায় কী?

4. Social Engineering Attacks
- Phishing
- Spear Phishing
- Whaling
- Smishing
- Vishing
- Baiting
- Tailgating
- Shoulder Surfing

Exam Focus
- Phishing Attack কী?
- Spear Phishing ও Phishing এর পার্থক্য।

5. Password Security
- Strong Password
- Password Policy
- Password Hashing
- Salt
- Brute Force Attack
- Dictionary Attack
- Rainbow Table Attack
- Multi-Factor Authentication (MFA)

6. Cryptography Encryption
- Symmetric Encryption
  - ✓ AES
  - ✓ DES
  - ✓ 3DES
- Asymmetric Encryption
  - ✓ RSA
  - ✓ ECC

Hashing
- MD5
- SHA-1
- SHA-256

Digital Signature

PKI (Public Key Infrastructure)

Important Questions
- Encryption ও Hashing এর পার্থক্য।

- RSA কী?
- Digital Signature এর কাজ কী?

7. Network Security

Devices

- Firewall
- IDS
- IPS
- Proxy Server
- VPN

Concepts

- NAT
- VLAN
- DMZ
- ACL

Protocol Security

- HTTPS
- SSL/TLS
- SSH
- IPSec

Frequently Asked

- Firewall কী?
- IDS ও IPS এর পার্থক্য।
- VPN কেন ব্যবহার করা হয়?

8. Network Attacks

DoS & DDoS

Man-in-the-Middle (MITM)

ARP Spoofing

MAC Flooding

DNS Spoofing

IP Spoofing

Session Hijacking

Packet Sniffing

Important Questions

- DDoS Attack কী?
- MITM Attack কীভাবে কাজ করে?

9. Web Application Security

OWASP Top 10

সবচেয়ে গুরুত্বপূর্ণ:

- SQL Injection
- Cross Site Scripting (XSS)
- Cross Site Request Forgery (CSRF)
- Broken Authentication
- Security Misconfiguration
- Sensitive Data Exposure

Important Questions

- SQL Injection কী?
- XSS Attack কী?
- CSRF Attack কী?

10. Server Security Windows Server Security

- Active Directory
- Group Policy
- NTFS Permission

Linux Server Security

- File Permission (chmod)
- sudo
- SSH Hardening

Server Protection

- Patch Management
- Backup
- Antivirus
- Log Monitoring

11. Server Related Attacks

- Privilege Escalation
- Remote Code Execution (RCE)
- Buffer Overflow
- Directory Traversal
- Zero-Day Attack
- Backdoor Attack

Important Questions

- Buffer Overflow কী?
- Zero-Day Vulnerability কী?

12. Email Security

- SMTP
- Spam
- Phishing Mail
- SPF
- DKIM
- DMARC

13. Cloud Security

- Shared Responsibility Model
- IAM
- Data Encryption
- Cloud Risks
- Public, Private, Hybrid Cloud

14. Incident Response

Steps

1. Preparation
2. Identification

3. Containment
4. Eradication
5. Recovery
6. Lessons Learned

15. Digital Forensics

- Evidence Collection
- Chain of Custody
- Log Analysis
- Disk Forensics
- Memory Forensics

16. Security Standards & Organizations

Standards

- ISO 27001
- NIST Cyber Security Framework
- PCI DSS

Organizations

- CERT
- CISA
- OWASP

Use entity references:

- OWASP
- NIST
- CISA

Top 20 MCQ Exam Focus (Must Read)

1. CIA Triad কী?
2. Virus ও Worm এর পার্থক্য।
3. Trojan Horse কী?
4. Phishing Attack কী?
5. Brute Force Attack কী?
6. Firewall এর কাজ কী?
7. IDS ও IPS এর পার্থক্য।
8. VPN কী?
9. DDoS Attack কী?
10. MITM Attack কী?
11. SQL Injection কী?
12. XSS কী?
13. CSRF কী?
14. AES কোন ধরনের Encryption?
15. RSA কোন ধরনের Encryption?
16. Hashing কী?
17. Digital Signature কী?
18. Buffer Overflow কী?
19. Zero-Day Vulnerability কী?
20. Incident Response এর ধাপগুলো কী?

জব পরীক্ষার জন্য সবচেয়ে গুরুত্বপূর্ণ ৫টি টপিক:

1. Network Security
2. Cryptography
3. Malware & Cyber Attacks
4. Web Security (SQL Injection, XSS, CSRF)
5. Server Security (Linux/Windows, Firewall, VPN, IDS/IPS)

প্রশ্ন যদি ডোমেইন বেসড হয় তাহলে মূল সিলেবাসের সাথে এই টপিক জোর দিয়ে পড়তে হবে।

Engineer (Server), NPCBL
Server/Data Center related Job Exam Suggestions

1. Server Fundamentals (Most Important)

What is a Server?

A server is a computer system that provides services, resources, or data to other computers (clients) over a network.

Key Characteristics

- High Performance
- High Availability
- Reliability
- Scalability
- Redundancy

Important Questions

- What is a server?
- Difference between Server and Client.
- Why are servers more reliable than PCs?

2. Types of Servers

Based on Services

Server Type	Function
Web Server	Hosts websites
File Server	File sharing
Database Server	Stores databases
Mail Server	Email services
DNS Server	Name resolution
DHCP Server	IP allocation
FTP Server	File transfer
Application Server	Runs applications
Proxy Server	Security and caching
Print Server	Printer management

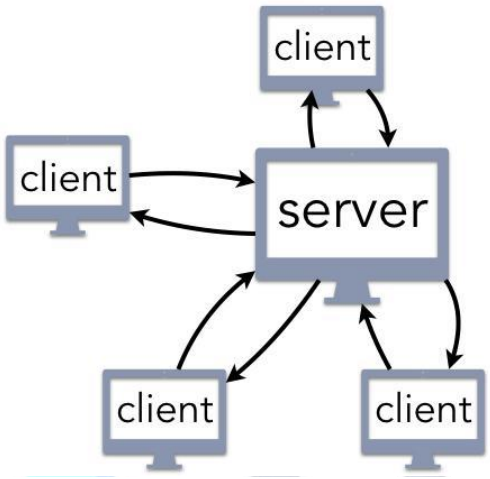
Frequently Asked

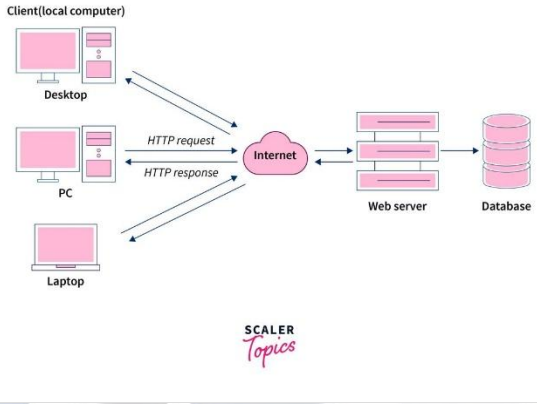
- What is a DNS Server?
- Difference between Web Server and Application Server.
- What is DHCP?

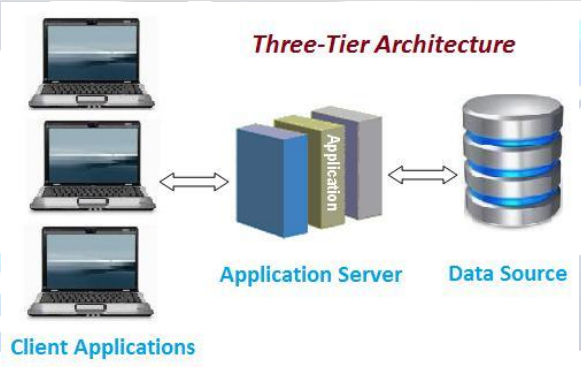
3. Client-Server Model

Architecture

- Client
- Server
- Network







Types

2-Tier Architecture

Client ↔ Database Server

3-Tier Architecture

Client ↔ Application Server ↔ Database Server

N-Tier Architecture

Exam Focus

- Explain Client-Server Architecture.
- Difference between 2-Tier and 3-Tier Architecture.

4. Server Hardware Components

CPU

- Multi-Core Processor

- Xeon Processor

RAM

- ECC RAM

Storage

- HDD
- SSD
- NVMe

Power Supply

- Redundant Power Supply

RAID Controller

NIC

- Network Interface Card

Important Questions

- What is ECC RAM?
- Why is SSD preferred in servers?

5. RAID (Very Important)

RAID Levels

RAID	Description
RAID 0	Striping
RAID 1	Mirroring
RAID 5	Striping + Parity
RAID 6	Dual Parity
RAID 10	RAID 1 + RAID 0

Exam Questions

- Difference between RAID 0 and RAID 1.
- Which RAID provides fault tolerance?
- Advantages of RAID 10.

6. Server Operating Systems

Linux

- Ubuntu Server
- CentOS
- Rocky Linux
- Debian

Windows

- Windows Server

Use entity references:

- Ubuntu Server
- Windows Server

Important Linux Commands

- pwd
- ls
- cd
- mkdir
- chmod
- chown

- top
- ps
- systemctl

Frequently Asked

- chmod command use.
- Difference between Linux and Windows Server.

7. Server Installation & Deployment

Steps

1. Hardware Setup
2. OS Installation
3. Network Configuration
4. Security Configuration
5. Service Installation
6. Backup Configuration
7. Monitoring

Important Concepts

- Bare Metal Server
- Rack Server
- Blade Server
- Tower Server

8. Server Management

User Management

- User Accounts
- Groups
- Permissions

Performance Monitoring

- CPU Usage
- RAM Usage
- Disk Usage
- Network Utilization

Log Management

- System Logs
- Event Viewer

Patch Management

- Updates
- Security Patches

9. Server Security

Security Measures

- Firewall
- Antivirus
- IDS
- IPS
- VPN

Access Control

- Authentication
- Authorization
- MFA

Important Questions

- What is Firewall?
- Why is MFA important?

---

10. Data Center Fundamentals

What is a Data Center?

A facility that houses servers, storage devices, networking equipment, and supporting infrastructure.

Components

- Servers
- Storage
- Network Devices
- Power Systems
- Cooling Systems
- Security Systems

11. Data Center Infrastructure

Power Systems

- UPS
- Generator
- PDU

Cooling Systems

- HVAC
- Precision Cooling

Fire Protection

- Smoke Detector
- Fire Suppression System

Physical Security

- Biometric Access
- CCTV

12. Data Center Standards

Tier Classification

Use entity references:

- Uptime Institute

Tier	Availability
Tier I	Basic
Tier II	Redundant Components
Tier III	Concurrently Maintainable
Tier IV	Fault Tolerant

Exam Questions

- Difference between Tier III and Tier IV.

13. Virtualization (Most Important)

What is Virtualization?

Creating virtual versions of servers, storage, networks, or operating systems.

Advantages

- Resource Utilization
- Cost Reduction
- Scalability
- Easy Backup

Types

- Server Virtualization
- Storage Virtualization
- Network Virtualization
- Desktop Virtualization

Hypervisor

Type-1 Hypervisor

(Bare Metal)

Examples:

- VMware ESXi
- Microsoft Hyper-V

Type-2 Hypervisor

Examples:

- Oracle VM VirtualBox
- VMware Workstation

Frequently Asked

- What is Hypervisor?
- Difference between Type-1 and Type-2 Hypervisor.

14. Cloud Computing (Very Important)

Definition

Cloud computing provides computing resources over the internet on demand.

Characteristics

- On-demand Service
- Broad Network Access
- Resource Pooling
- Rapid Elasticity
- Measured Service

15. Cloud Service Models

IaaS

Infrastructure as a Service

Examples:

- Virtual Machine
- Storage

PaaS

Platform as a Service

SaaS

Software as a Service

Exam Focus

Model	User Manages
IaaS	OS + Applications
PaaS	Applications

Model User Manages

SaaS Only Usage

Frequently Asked

- Difference among IaaS, PaaS, SaaS.

16. Cloud Deployment Models

- Public Cloud
- Private Cloud
- Hybrid Cloud
- Community Cloud

Important Questions

- Public Cloud vs Private Cloud.
- What is Hybrid Cloud?

17. Major Cloud Providers

- Amazon Web Services (AWS)
- Microsoft Azure
- Google Cloud Platform (GCP)
- Oracle Cloud Infrastructure (OCI)
- IBM Cloud

Frequently Asked

- What is AWS?
- Name three cloud service providers.

18. Storage Technologies

DAS

Direct Attached Storage

NAS

Network Attached Storage

SAN

Storage Area Network

Frequently Asked

- Difference between NAS and SAN.

19. Backup & Disaster Recovery

Backup Types

- Full Backup
- Incremental Backup
- Differential Backup

Concepts

- RPO (Recovery Point Objective)
- RTO (Recovery Time Objective)

Important Questions

- Difference between Incremental and Differential Backup.
- What is Disaster Recovery?

20. Most Important MCQs (Must Read)

1. What is a server?
2. Types of servers.
3. Client-Server architecture.
4. Difference between 2-tier and 3-tier architecture.
5. RAID 0, RAID 1, RAID 5, RAID 10.

6. What is virtualization?
7. What is a hypervisor?
8. Type-1 vs Type-2 Hypervisor.
9. What is a data center?
10. Data center tier classifications.
11. What is cloud computing?
12. Characteristics of cloud computing.
13. IaaS, PaaS, SaaS differences.
14. Public vs Private Cloud.
15. NAS vs SAN.
16. UPS and PDU functions.
17. Linux server basic commands.
18. Backup types.
19. RPO and RTO.
20. Server security best practices.

Last-Minute Revision Topics (Highest Priority)

1. Client-Server Architecture
2. Types of Servers
3. RAID Levels
4. Virtualization & Hypervisor
5. Data Center Tier I-IV
6. Cloud Computing
7. IaaS / PaaS / SaaS
8. AWS, Azure, GCP
9. NAS vs SAN
10. Backup & Disaster Recovery
11. Linux Server Management
12. Server Security
13. Load Balancing
14. High Availability (HA)
15. Disaster Recovery (DR)

এই ১৫টি টপিক ভালোভাবে প্রস্তুত করলে সরকারি আইটি ক্যাডার, সহকারী প্রোগ্রামার, সিস্টেম অ্যানালিস্ট, নেটওয়ার্ক/সার্ভার অ্যাডমিন, ডেটা সেন্টার ও ক্লাউড-সম্পর্কিত অধিকাংশ চাকরির পরীক্ষার ৭০–৮০% Server & Cloud অংশ কভার হয়ে যাবে।

প্রশ্ন যদি ডোমেইন বেসড হয় তাহলে মূল সিলেবাসের সাথে এই টপিক জোর দিয়ে পড়তে হবে।

Engineer (Quality), NPCBL
SQA related Job Exam Suggestions

Engineer (Quality) – Nuclear Power Plant Company Bangladesh Ltd (NPCBL)

১. Quality Engineering Fundamentals

(অত্যন্ত গুরুত্বপূর্ণ)

Quality সম্পর্কিত মূল ধারণা

- Quality Assurance (QA)
- Quality Control (QC)
- Quality Management System (QMS)
- Verification vs Validation
- Defect, Error, Bug, Failure
- Quality Audit
- Quality Improvement

গুরুত্বপূর্ণ প্রশ্ন

- QA ও QC এর মধ্যে পার্থক্য কী?
- Verification এবং Validation কী?
- Quality Assurance এর উদ্দেশ্য কী?

২. Software Quality Assurance (SQA)

CSE ব্যাকগ্রাউন্ডের জন্য সবচেয়ে গুরুত্বপূর্ণ অংশ।

Topics

- SDLC (Software Development Life Cycle)
- Waterfall Model
- Agile Model
- Scrum
- Software Testing Life Cycle (STLC)

Testing Types

- Unit Testing
- Integration Testing
- System Testing
- Acceptance Testing
- Regression Testing
- Smoke Testing
- Performance Testing
- Security Testing

Frequently Asked

- Unit Testing কী?
- Regression Testing কী?
- Agile Model এর সুবিধা কী?

৩. Software Testing

Black Box Testing

- Equivalence Partitioning
- Boundary Value Analysis

White Box Testing

- Statement Coverage
- Branch Coverage
- Path Coverage

Test Artifacts

- Test Plan
- Test Case
- Test Scenario
- Bug Report

৪. ISO Standards (খুব গুরুত্বপূর্ণ)

Quality Engineer পরীক্ষায় প্রায়ই আসে।

Standards

- ISO 9001 (Quality Management System)
- ISO 27001 (Information Security)
- ISO 45001 (Occupational Health and Safety)
- ISO 14001 (Environmental Management)

Important Questions

- ISO 9001 কী?
- ISO 27001 এর উদ্দেশ্য কী?

৫. Nuclear Industry Quality Concepts

NPCBL-এর জন্য বিশেষভাবে গুরুত্বপূর্ণ।

Topics

- Nuclear Safety Culture
- Quality Management in Nuclear Facilities
- Configuration Management
- Risk Assessment
- Corrective Action
- Preventive Action (CAPA)

Terms

- QA Program
- Safety Classification

- Traceability
- Compliance

৬. Database Quality & Management

DBMS

- Normalization
- Primary Key
- Foreign Key
- Transaction

SQL

- SELECT
- JOIN
- GROUP BY
- HAVING
- Subquery

Questions

- WHERE এবং HAVING এর পার্থক্য।
- Primary Key vs Foreign Key।

৭. Networking & Security

Network Basics

- OSI Model
- TCP/IP Model
- IP Address
- DNS
- DHCP

Security

- Firewall
- VPN
- IDS
- IPS
- Encryption

৮. Server & Data Center

Topics

- Server Types
- RAID
- Virtualization
- Backup
- Disaster Recovery

Frequently Asked

- RAID 1 ও RAID 5 এর পার্থক্য।
- Virtualization কী?

৯. Information Security

CIA Triad

- Confidentiality
- Integrity
- Availability CIA

Attacks

- Malware
- Ransomware
- Phishing
- SQL Injection

১০. Project Management

Topics

- Project Planning
- Gantt Chart
- Critical Path Method (CPM)
- Risk Management

Important Questions

- SDLC কী?
- Agile vs Waterfall।

১১. Documentation & Reporting

Quality Engineer হিসেবে এটি খুবই গুরুত্বপূর্ণ।

Documents

- SOP (Standard Operating Procedure)
- Work Instruction
- Audit Report
- Incident Report
- Test Report
- Quality Report

১২. Industrial Automation & SCADA (বিশেষ গুরুত্ব)

Power Plant পরীক্ষায় প্রায়ই আসে।

Topics

- SCADA
- PLC
- HMI
- DCS

Questions

- SCADA কী?
- PLC এর কাজ কী?

Use entity references:

- SCADA
- PLC

১৩. Cloud & Modern Infrastructure

Topics

- Cloud Computing

- IaaS
- PaaS
- SaaS
- Virtual Machines
- Containers

Platforms

- AWS
- Microsoft Azure

NPCBL Engineer (Quality) – Top Priority Topics

যদি সময় কম থাকে, তাহলে এই ১৫টি টপিক আগে পড়ুন:

1. Quality Assurance (QA)
2. Quality Control (QC)
3. Verification vs Validation
4. SDLC & STLC
5. Software Testing Types
6. ISO 9001
7. ISO 27001
8. Nuclear Safety Culture
9. Risk Management
10. Database & SQL
11. Networking Basics
12. Information Security
13. Server & Virtualization
14. SCADA / PLC / DCS
15. Documentation & Audit

Viva-তে খুব সম্ভাব্য প্রশ্ন

- QA এবং QC এর মধ্যে পার্থক্য কী?
- ISO 9001 কী?
- Verification vs Validation কী?
- SDLC কী?
- Agile Model কী?
- SQL JOIN কত প্রকার?
- Firewall কী?
- RAID কী?
- Virtualization কী?
- SCADA কী?
- PLC কী?
- Nuclear Safety Culture বলতে কী বোঝায়?
- CAPA কী?
- Risk Assessment কী?
- Quality Audit কী?