Operating System	
PART: 01	**GATE EXAM – Operating System**
	Operating System Syllabus
	Introduction to Operating System and Its Functions
	Batch Operating System | Types of Operating System
	Multiprogramming and Multitasking Operating System
	Types of OS (Real Time, Distributed, Clustered and Embedded)
	Process States in Operating System
	Important Linux Commands
	System Calls in Operating System and Its Types
	Fork System Call with Example
	Fork System Call with Explanation
	User Mode and Kernel Mode in Operating System
	Process vs Threads in Operating System
	User Level vs Kernle Level Thread in Operating System
	Process Scheduling Algorithms (Preemption vs Non-Preemption) | CPU Scheduling
	What is Arrival, Burst, Completion, Turnaround, Waiting and Response Time in CPU
	First Come First Serve (FCFS) CPU Scheduling Algorithm with Example
	Shortest Job First (SJF) Scheduling Algorithm with Example
	Shortest Remaining Time First (SJF with Preemption) Scheduling Algorithm
	Shortest Job First (SJF with Preemption) Scheduling Algorithm
	Round Robin (RR) CPU Scheduling Algorithm with Example
	Pre-emptive Priority Scheduling Algorithm with Example
	Example of Mix Burst Time (CPU and I/O both) in CPU Scheduling
	Multi-Level Queue Scheduling
	Multilevel Feedback Queue Scheduling
	Process Synchronization Process Types | Race Condition
	Producer Consumer Problem | Process Synchronization Problem
	Printer-Spooler Problem | Process Synchronization Problem
	Critical Section Problem | Mutual Exclusion, Progress and Bounded Waiting
	LOCK Variable in OS | Process Synchronization
	Test and Set Instruction in OS | Process Synchronization
	Tum Variable | Strict Alteration Method | Process Synchronization
	Semaphores | Wait, Signal Operation | Counting Semaphore Examples
	What is Binary Semaphore | Easiest Explanation
	Practice Question on Binary Semaphore
	Solution of Producer Consumer Problem Using Semaphore
	Solution of Readers-Writers Problem Using Binary Semaphore
	Dining Philosophers Problem and Solution Using Semaphore
	DEADLOCK Concept Example | Necessary Condition
	Resource Allocation Graph in Deadlock | Single Instance with Example
	Multi-Instance Resource Allocation Graph with Example

	Deadlock Handling Methods and Deadlock Prevention
	Deadlock Avoidance Banker's Algorithm with Example
-	GATE Question on Banker's Algorithm | Deadlock Avoidance
-	Question Explanation on Deadlock
-	GATE Question Explanation
	Memory Management and Degree of Multiprogramming
	Memory Management Techniques | Contiguous and Non-Contiguous
	Internal Fragmentation | Fixed Size Partitioning | Memory Management
	Variable Size Partitioning | Memory Management
	First Fit, Next Fit, Best Fit, Worst Fit Memory Allocation
-	GATE Question Solved on First Fit, Best Fit and Worst Fit Memory Allocation
-	GATE Question Solved on First Fit, Best Fit and Worst Fit Memory Allocation with Timeline
	Need of Paging | Memory Management
	What is Paging | Memory Management
-	Question Explanation on Logical Address and Physical Address Space
-	Question Explanation on Paging | Memory Management
	Page Table Entries Format of Page Table
	2-Level Paging in Operating System | Multilevel Paging
	Inverted Paging | Memory Management
-	Questions Paging in Operating System
	What is Thrashing
	Segmentation vs Paging | Segmentation Working
	Overlay | Memory Management
	Virtual Memory | Page Fault | Significance of Virtual Memory
	Translation Lookaside Buffer (TLB) in Operating System
	Numerical On Translation Lookaside Buffer (TLB)
	Page Replacement Introduction | FIFO Page Replacement Algorithm
	Belady's Anomaly in FIFO Page Replacement with Example
	Optimal Page Replacement Algorithm
	Least Recently Used Page Replacement Algorithm
	Most Recently Used Page Replacement Algorithm
	Hard Disk Architecture in Operating System
	Disk Access Time with Example | Seek Time Rotational Time and Transfer Time
	Disk Scheduling Algorithm
	FCFS in Disk Scheduling with Example
	SSTF in Disk Scheduling with Example
	SCAN Algorithm in Disk Scheduling with Example
	LOOK Algorithm in Disk Scheduling with Example
	C-SCAN Algorithm in Disk Scheduling with Example
	C-LOOK Algorithm in Disk Scheduling with Example
-	Question On Operating system
	File System in Operating system | Windows, Linux, Unix, Android, Etc
	File Attributes and Operations in Operating System

	Allocation Methods in Operating System | Contiguous and Non-Contiguous
	Contiguous Allocation in Operating System | Advantages and Disadvantages
	Linked List Allocation in File Allocation whit Example
	Indexed File Allocation in Operating System
	Unix Inode Structure with Numerical Example
	Protection and Security in Operating System
-	Linker and Loader with Example

Computer Networks and Security	
PART: 01	**GATE EXAM – Computer Networks and Security**
	Computer Networks and Security Full Syllabus
	Introduction to Computer Network | OSI Model in Easiest Way
	LAN, MAN, WAN, PAN, CAN | Computer
	TCP/IP Protocol Suite | Internet Protocol Suite | OSI vs TCP/IP
	Physical Layer in Computer Network | Function of Physical Layer
	Topologies in Computer Network Part-1 | Mesh, Star, Hub, Bus, Hybrid
	Topologies in Computer Network Part-2 | Mesh, Star, Hub, Bus, Hybrid
	Manchester Encoding and Differential Manchester Encoding
	Various Devices in Computer Networks | Hardware and Software Devices
	Types of Cables in Computer Networks | Coaxial, Twisted Pair, Fiber Optic Cable
	Repeaters in Computer Networks | Physical Layer Devices
	Hub in Computer Networks | Physical Layer Devices
	Bridges in Computer Networks | Physical and data Link Layer Devices
	Switch, Hub and Bridge Explained – What's the Difference
	Routers in Computer Networks | Physical, Data Link and Network Layer Device
	Collision Domain Vs. Broadcast Domain | Repeater, Hub, Bridge, Switch, Router
	What is Circuit Switching in Computer Networks
	Packet Switching in Computer Networks
	Datagram Switching vs Virtual Circuit Switching in Packet Switching
	What is Message Switching in Computer Networks
	Unicast, Broadcast and Multicast in Computer Networks
	Data Link Layer in Computer Networks and Its Responsibilities
	Stop and Wait ARQ Protocol | Data Link Layer
	Go-Back-N ARQ (Automatic Repeat Request | Data Link Layer
	Selective Repeat ARQ (Automatic Repeat Request) Data Link Layer
	Various Flow Control Protocols | Stop and Wait, GoBackN and Selective Repeat
	Framing in Data Link Layer | Bit Stuffing vs Byte Stuffing
	Introduction to Error Detection and Correction

	Single Bit Parity Along with Hamming Distance Concept
	Cycle Redundancy Check (CRC) for Error Detection and Correction
	Hamming Code for Error Detection and Correction both with Easiest Example
	Various Medium Access Control Protocols in Data Link Layer
	What is Pure Aloha | MAC Layer Protocol
	Pure Aloha vs Slotted Aloha
	Carrier Sense Multiple Access in Computer Network
	Carrier Sense Multiple Access / Collision Detection | CSMA/CD
	CSMA/CA in Computer Network Full Explanation
	Question on CSMA/CD
	Ethernet Frame Format (IEEE-802.3) in Data Link Layer
	Token Ring (IEEE 802.5) in Computer Network
	Network Layer | Responsibilities of Network Layer | OSI Model
	Class A in IP Addressing with Example | Class-full Addressing | Network Layer
	Class B in IP Addressing with Example | Class-full Addressing | Network Layer
	Class C in IP Addressing with Example | Class-full Addressing | Network Layer
	Class D and Class E in IP Addressing with Example | Class-full Addressing | Network Layer
	Find Range, Network ID, Host, Broadcast Address with Numerical Example
	Disadvantages of Class-full Addressing | IP Addressing
	What is Class-less Addressing (CIDR) | CIDR vs Class-full Addressing
	Sub-netting in Class-full Addressing with Examples
	Variable Length Subnet Masking (VLSM) with Examples
	Sub-netting in CIDR Addressing | Class-less Inter-domain Routing with Example
-	Question Numerical CIDR | Class-less Addressing
	VLSM in Class-less Addressing (CIDR) | Variable Length Subnet Masking
	IPv4 Header Format Explained
	Fragmentation of IPv4 Datagram | Identification, Flags and Fragment Offset | Networks
	Options and Padding in IPv4 Header
	IPv6 Header Format | IPv4 vs IPv6 in Computer Network
	What is Routing Protocols | Various Types of Routing Protocols
	Distance Vector Routing Algorithm
	Count to Infinity Problem in Distance Vector Routing
	Link State Routing in Computer Network
	ARP Explained – Address Resolution Protocol | Network Layer
	NAT Explained – Network Address Translation with Example
	Transport Layer | Responsibilities of Transport Layer | OSI Model
	Why Both IP and Port Address is Used for Connection | Socket Address Real Life Example
	TCP: Transmission Control Protocol | TCP Header | Transport Layer Part-1
	TCP: Transmission Control Protocol | TCP Header | Transport Layer Part-2
	TCP Connection Establishment and Connection Termination | Transport Layer
	TCP Data Transfer | Piggybacking and Pure Acknowledgement
	Connection Termination in TCP with Example
	TCP Congestion Control in Computer Networks

	UDP (User Datagram Protocol) Header in Computer Network
	Advantages of UDP Protocol Over TCP | Transport Layer
	TCP vs UDP Differences
	Session Layer of OSI Model | Session Layer Functions
	Presentation Layer in Computer Network | OSI Model
	Application Layer of OSI Model | Application Layer Protocols and Port No
	Domain Name System (DNS) in Computer Networks
	Domain Name Server (DNS) and Its Types
	HTTP, FTP, SMTP, FOP | Application Layer Protocols
	Persistent vs Non-Persistent HTTP | HTTP/1.0 vs HTTP/1.1
	SMTP vs POP3 vs IMAP with Real Life Example | Application Layer Protocols
	Cryptography in Computer Network Cryptography in Information Security
	Symmetric Key Cryptography in Network Security with Example
-	Question on Network Security | Symmetric Key Cryptography
	Asymmetric Key Cryptography with Example | Network Security
	RSA Algorithm in Network Security with Examples
	What is Firewalls and How it Works | Packet Filtering Firewall Explained
	What is Application (Proxy) Firewall | Network Security Part-2
-	Questions on Computer Networks
	All Networking Protocols and Devices | Summary From Physical and Application Layer
	Top Linux Network Commands
	Socket Programming in Computer Networks
	Need of IPv6 Protocol | Why IPv6 is Required
	What is IPSec Protocol | IPsec Introduction
	Transport Mode vs Tunnel Mode in IPSec
	Basic of Communication
	Bandwidth vs Throughput vs Latency
	Fast Ethernet vs Gigabit Ethernet with Examples
	What is Ping and Loopback in Network
	HTPP vs HTTPs with Examples
	TCP/IP Protocol Suite with Real Live Examples | Why TCP/IP Used | Fundamentals
	IPSec vs SSH vs. SSL/TLS Network Security Protocols
	What is VPN | How VPN Works | Virtual Private Network (VPN) with Real Life Example

Security System	
PART: 01	**Cyber Security**
	Course Outline
	Requirement
	Getting Ready
	Effective Note Keeping
	Connect with Community
	What is Cyber Security
	History of Cyber Attacks
	Inclusion Detection System
	Careers in Cyber Security
	Types of Hackers
	Cyber Threats, Malware
	Phishing
	MITM Attacks
	DDOS Attacks
	Password Attacks
	Maladvertising
	Rouge Software
	What is Penetration Testing
	Types of Penetration Testing
	States of Penetration Testing
	Hashing and Digital Signatures
	Cryptography
	The CIA Traid
	Foot Printing
	Linux Started
	What is Linux
	What is Linux
	Installing Linux VM
	Linux File System
	Linux Commands
	Important and Sensitive Linux Files
	What is Network
	IP Addresses
	Switches and Routes
	Ports and Protocols
	NMAP
	TCP and UDP Protocols
	What is Website
	What is Database
	Client and Server

	Domains and Sub-Domains
	Request and Response
	Cookies and Tasty
	HTTP and HTTPs
	HTTP Methods
	Burp Suite
	HTTP Status Codes
	OWASP-1
	OWASP-2
	OWASP-3
	OWASP-4
	OWASP-5
	Weapon zing
	Bug Bounty
PART: 02	**Cyber and Information Security**
	Information Security Basic Concepts
	Information Security Management and Governance
	Cryptography Hashing Ciphering
	Message Authentication, SSL, TSL and Digital Signature
	Risk Management and Business Continuity Management
	Computer Security, Platform, Virtualization and Hyper-V
	Digital Forensics and Incident Response, Evidence
	User Authentication, Passwords, Tokens and Biometrics
	Identity Management and Access Control, OpenId
	Communication Security, TSL, TCP/IP, HTTPS, SSL
	Network Perimeter Security, Firewalls, Proxies
	Malicious Software, Attacks and Application Security
	Review and Recap – Project
	OWASP Top 10, Injection, XSS, Authentication Attack