**SIMATS ENGINEERING**

**SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES**

**CHENNAI-602105**

**ASSIGNMENT - 5**

**CSA0735 - COMPUTER NETWORKS**

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| **S.No.** | **Register Number** | **Name** | **Questions** |
| 1 | 192524212 | ADUSURU HARSHA VARDHAN | **Scenario:** A multinational corporation configures internal DNS to manage internal and external queries. **Questions:** a) Describe the hierarchical structure of DNS. b) Calculate the query resolution time if each DNS server introduces a delay of 25ms across 4 levels. c) Distinguish between authoritative and recursive DNS. d) Suggest a strategy to reduce DNS lookup time in large enterprises. |
| 2 | 192511137 | ARSHIYA A | **Scenario:** A university sends bulk notifications via SMTP. **Questions:** a) Explain the working of SMTP during message delivery. b) If 1000 messages of 1MB are sent with a transmission rate of 10 Mbps, calculate total transmission time. c) Compare SMTP with POP3 in terms of message storage. d) Suggest load balancing techniques for mail servers. |
| 3 | 192571057 | B S JAYANISANTH | **Scenario:** A software company uploads large builds daily to its testing servers via FTP. **Questions:** a) Differentiate between active and passive FTP. b) Calculate expected FTP throughput when RTT is 100ms, window size is 64KB. c) Discuss FTP’s control and data channels. d) Suggest optimizations for transferring 10GB+ files. |
| 4 | 192511160 | BANDREDDY MOKSHASREE | **Scenario:** An online store uses HTTP and HTTPS for customer transactions. **Questions:** a) Differentiate between HTTP 1.1 and HTTP/2. b) If a web page has 20 objects of 150KB each, estimate total download time over 20 Mbps. c) Explain the need for persistent HTTP connections. d) How does SSL enhance HTTP security? |
| 5 | 192572085 | CHAKALI MANOJ | **Scenario:** A mobile app uses POP to retrieve emails. **Questions:** a) Explain POP3 session flow. b) Determine storage needed for 1000 users receiving 15MB/day emails. c) Compare POP and IMAP. d) Suggest caching mechanisms for slow connections. |
| 6 | 192524260 | CHILLA PAVANI | **Scenario:** A data center uses SNMP to monitor device health. **Questions:** a) Describe SNMP roles: manager, agent, MIB. b) If polling 500 devices every 60 seconds, calculate SNMP request rate. c) Discuss SNMPv2 vs SNMPv3 in terms of security. d) Recommend how SNMP traps can reduce bandwidth usage. |
| 7 | 192525115 | CHINNA THUMBALAM MOHAMMED UBED | **Scenario:** A P2P application distributes large video files. **Questions:** a) Differentiate client-server vs. peer-to-peer models. b) If each peer shares 5GB to 100 other peers, estimate total network load. c) Discuss tracker-based vs. trackerless P2P networks. d) Suggest bandwidth optimization techniques. |
| 8 | 192511139 | DHANSHIKA R A | **Scenario:** A firm uses VoIP over the Internet for meetings. **Questions:** a) Explain how VoIP handles voice packetization. b) Calculate jitter if packet delays vary between 20-50ms. c) Suggest codecs for compressing VoIP traffic. d) Recommend network settings to avoid packet loss. |
| 9 | 192521216 | DHARSHAN SRINATH S | **Scenario:** A media firm uses overlay networks for efficient video delivery. **Questions:** a) Define overlay networks with real-time examples. b) Estimate total hop delay in a 5-node overlay with 10ms per hop. c) Compare overlay routing vs. traditional IP routing. d) Suggest applications that benefit from overlay structures. |
| 10 | 192525228 | DUNNAPOTHULA NAGA BABU | **Scenario:** A bank enforces SSL for all web interactions. **Questions:** a) Describe the SSL handshake process. b) If the handshake adds 500ms delay per session, calculate daily delay for 10,000 sessions. c) Discuss SSL certificates and public key usage. d) Recommend session reuse mechanisms. |
| 11 | 192511164 | FURTHOSE SAMREEN S | **Scenario:** An enterprise deploys stateful firewalls at each branch. **Questions:** a) Explain stateful vs stateless firewalls. b) If 10,000 packets are filtered per minute, estimate hourly inspection load. c) Discuss deep packet inspection benefits. d) Recommend access control policies for internal/external users. |
| 12 | 192525082 | GANGAVARAPU ABHINAY REDDY | **Scenario:** A university server is targeted by a SYN flood attack. **Questions:** a) Describe how a DoS attack overwhelms systems. b) Calculate the packet rate needed to exhaust a 1 Gbps link. c) Propose detection techniques using threshold models. d) Suggest mitigation strategies. |
| 13 | 192511093 | JANANI SRI R | **Scenario:** An ISP wants to optimize DNS lookup using caching. **Questions:** a) How does TTL affect DNS caching? b) Estimate average savings in latency if cached queries save 200ms for 10,000 users. c) Compare local vs public DNS resolvers. d) Suggest prefetching strategies. |
| 14 | 192524224 | K BHASHITHA | **Scenario:** A legal firm uses S/MIME for client confidentiality. **Questions:** a) Explain the working of S/MIME. b) Calculate encryption overhead if each email has 2x payload due to signing. c) Compare S/MIME with PGP. d) Recommend key distribution methods. |
| 15 | 192511125 | K RITHIKA | **Scenario:** A design agency handles sensitive client files via FTP. **Questions:** a) Contrast FTP and SFTP in terms of security. b) Estimate encryption delay per 10MB file over SFTP. c) Discuss secure authentication methods. d) Recommend firewall rules for FTP/SFTP. |
| 16 | 192512093 | KAMALI S I | **Scenario:** A blog site uses CDN with HTTP caching. **Questions:** a) How do ETags improve HTTP caching? b) Estimate reduced bandwidth usage for 100,000 cached page views of 1MB each. c) Discuss CDN edge server architecture. d) Suggest TTL settings for static vs dynamic content. |
| 17 | 192525075 | KOTHAKOTA RAKESH | **Scenario:** A news agency uses a POP server to fetch emails every 10 minutes for its global journalists. The organization uses a central server with fixed bandwidth. **Parameters:** 200 users, 5MB per session, check every 10 mins. **Questions:** a) Explain the working mechanism of POP3. b) Estimate the daily data volume transferred by the POP server. c) Compare POP3 and IMAP in device synchronization. d) Recommend ways to handle increasing user traffic. |
| 18 | 192524247 | KUNATI SAI LIKHITH | **Scenario:** A hospital uses VoIP for internal communications and reports inconsistent voice quality. **Parameters:** Packet delays range from 25ms to 75ms. **Questions:** a) Define jitter in the context of VoIP. b) Compute jitter value given the variation in delay. c) Suggest jitter buffer techniques to enhance quality. d) Recommend network upgrades to reduce delay. |
| 19 | 192524071 | LATISHA S | **Scenario:** A company uploads nightly updates to its server via FTP over a 100 Mbps link. **Parameters:** Upload size = 250MB, Bandwidth = 100 Mbps. **Questions:** a) Differentiate active and passive FTP. b) Calculate total upload time for 250MB. c) Recommend improvements to enhance upload speed. d) Suggest a secure alternative to FTP. |
| 20 | 192565040 | LOGESHWARI S | **Scenario:** An e-learning portal experiences heavy user load during online exams. **Parameters:** 500 users, each accessing 10MB content. **Questions:** a) Discuss persistent HTTP and its advantages. b) Calculate total data served during peak. c) Recommend caching mechanisms to reduce latency. d) Propose CDN strategies to handle load. |
| 21 | 192521170 | LOKESH KUMAR V | **Scenario:** A fintech firm ensures DNS availability using redundant servers. **Parameters:** 4 servers, each with 25ms delay, failover adds 30ms. **Questions:** a) Describe DNS redundancy models. b) Calculate expected resolution time during failover. c) Recommend optimal TTL values. d) Suggest best practices for global failover configuration. |
| 22 | 192525107 | M HEMANTH KUMAR | **Scenario:** A marketing platform sends newsletters to thousands of users during campaigns. **Parameters:** 1000 emails, 3 seconds/email. **Questions:** a) Explain SMTP message queuing. b) Compute total delivery time for all emails. c) Propose load balancing across SMTP relays. d) Suggest techniques to prevent blacklisting. |
| 23 | 192511178 | MOHAMED SYED THOWFIQ S | **Scenario:** An e-commerce site enforces HTTPS on all user transactions. **Parameters:** 10,000 sessions/day, 0.2s SSL handshake/session. **Questions:** a) Describe SSL/TLS handshake steps. b) Calculate total handshake time per day. c) Compare session reuse with full handshake. d) Suggest optimizations for SSL performance. |
| 24 | 192521220 | MOHAMMAD ALEYAS | **Scenario:** A financial web portal faces SYN flood attacks during peak hours. **Parameters:** 10,000 SYN packets/sec, link = 1 Gbps. **Questions:** a) Explain SYN flooding and its impact. b) Estimate data rate from SYN flood attack. c) Recommend firewall rule sets to counteract. d) Suggest anomaly detection techniques. |
| 25 | 192511188 | MOUNNILA S P | **Scenario:** A call center evaluates codecs for better bandwidth management. **Parameters:** G.711 = 64kbps, G.729 = 8kbps, 50 simultaneous calls. **Questions:** a) Compare the performance of G.711 and G.729. b) Compute total bandwidth for 50 calls with each codec. c) Discuss the impact of compression on call quality. d) Propose network QoS settings for VoIP. |
| 26 | 192525059 | MUSTURI BALAJI | **Scenario:** A startup delivers music using a peer-to-peer distribution system. **Parameters:** 500 peers, 100MB shared per peer. **Questions:** a) Explain the working of peer-to-peer file sharing. b) Estimate total network load. c) Suggest DHT-based routing techniques. d) Recommend a hybrid architecture to reduce delays. |
| 27 | 192572086 | NITYA PRIYA P M | **Scenario:** A telecom provider monitors its routers every 30s using SNMP. **Parameters:** 2000 routers, 1KB per message. **Questions:** a) Explain the SNMP polling mechanism. b) Calculate bandwidth consumption per hour. c) Suggest optimization using traps. d) Compare SNMPv2 and SNMPv3 in traffic and security. |
| 28 | 192524244 | NUHA FATHIMA H | **Scenario:** A global web application uses geo-DNS to serve users from nearby data centers. **Parameters:** 30% traffic redirected to local DNS, each lookup = 200ms saved. **Questions:** a) Explain geo-DNS and how it works. b) Estimate total latency savings for 10,000 lookups. c) Propose DNS failover strategies. d) Recommend a TTL policy. |
| 29 | 192524072 | PRASHANTH G | **Scenario:** A university firewall filters lab traffic while restricting social media access. **Parameters:** 100 rules, 1ms processing per rule. **Questions:** a) Design firewall rules to block Facebook and allow research traffic. b) Calculate total delay in packet processing. c) Recommend rule optimization techniques. d) Suggest logging policies for compliance. |
| 30 | 192525231 | PRATTIPATI HASINI | **Scenario:** A company filters 5000 emails/day, with 20% identified as spam. **Parameters:** 1000 spam emails/day. **Questions:** a) Describe content-based spam filtering. b) Estimate time saved if spam is auto-filtered. c) Propose ML models for spam classification. d) Compare cloud-based vs. local spam filters. |
| 31 | 192524267 | RIFA FATHIMA S | **Scenario:** A file-sharing app uses overlay routing to share large files. **Parameters:** 6 overlay hops, 10ms per hop. **Questions:** a) Explain overlay routing. b) Calculate total hop delay. c) Compare structured overlays like Chord vs. unstructured ones. d) Propose a fault-tolerant routing algorithm. |
| 32 | 192511104 | S LEKHA | **Scenario:** A remote team uses VoIP for 1-hour daily calls. **Parameters:** 20 users, 64kbps codec. **Questions:** a) Compute daily and monthly data usage per user. b) Calculate total bandwidth needed. c) Suggest QoS policies for VoIP traffic. d) Discuss the role of SIP in VoIP. |
| 33 | 192525222 | SAKA CHANDRA SIDDHARDHA | **Scenario:** A firm ensures secure email access across devices. **Parameters:** 100 employees, 10MB emails/day. **Questions:** a) Differentiate POP3 vs IMAP in functionality. b) Estimate monthly storage required. c) Suggest TLS configuration for secure access. d) Recommend an anti-phishing policy. |
| 34 | 192511172 | SAMRAKSHINI G | **Scenario:** A graphic studio shares project files over FTP with global clients. **Parameters:** 2GB file, 100 Mbps link. **Questions:** a) Estimate transfer time over FTP. b) Propose secure file sharing alternatives. c) Discuss FTP firewall ports. d) Recommend passive mode for NAT clients. |
| 35 | 192521169 | SARATH B | **Scenario:** An app relies on fast DNS resolution for APIs. **Parameters:** 5 hops, 250ms total delay. **Questions:** a) Calculate average hop delay. b) Recommend caching strategies. c) Explain DNS prefetching. d) Compare DNS and DoH protocols. |
| 36 | 192521204 | SHAROON STONE M | **Scenario:** VoIP calls drop after 10 minutes due to NAT session timeout. **Parameters:** NAT timeout = 600s, keep-alive = 20s. **Questions:** a) Explain NAT traversal issues in VoIP. b) Estimate keep-alive traffic for 50 clients. c) Suggest STUN and TURN usage. d) Recommend timer settings to prevent disconnection. |
| 37 | 192572096 | SHRAAVANI N | **Scenario:** A retail site sends 1 million emails during a festival. **Parameters:** 0.5MB/email, 100 Mbps bandwidth. **Questions:** a) Estimate total time to send all emails. b) Suggest mail queue management techniques. c) Discuss SMTP throughput limitations. d) Recommend anti-spam compliance. |
| 38 | 192525060 | SYED ARSHAD | **Scenario:** An ISP optimizes DNS caching to reduce upstream queries. **Parameters:** 30% of queries served from cache, 200ms per query saved. **Questions:** a) Explain positive vs. negative caching. b) Estimate total latency saved for 10,000 users. c) Propose TTL values for static domains. d) Suggest methods to avoid cache poisoning. |
| 39 | 192572091 | TALARI VISHNUVARDHAN | **Scenario:** A startup uses HTTPS for all web services. **Parameters:** 300 sessions, 0.5s SSL handshake overhead. **Questions:** a) Calculate total daily handshake time. b) Recommend TLS session reuse. c) Compare RSA vs ECC key exchange. d) Suggest performance improvements with HTTP/2. |
| 40 | 192524236 | THANUSHREE P | **Scenario:** A news site uses GZIP to reduce content delivery time. **Parameters:** 1MB compresses to 300KB, 100K users. **Questions:** a) Estimate total bandwidth saved. b) Explain content negotiation headers. c) Recommend compression for different content types. d) Discuss trade-offs in client-side decompression. |