**SIMATS ENGINEERING**

**SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES**

**CHENNAI-602105**

**ASSIGNMENT - 1**

**CSA07 - COMPUTER NETWORKS**

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| **S.No.** | **Register Number** | **Name** | **Questions** |
| 1 | 192524212 | ADUSURU HARSHA VARDHAN | ****Network Models and Design Principles**** **Scenario:** A university campus is upgrading to a new digital infrastructure connecting multiple departments and hostels with high-speed access.  **Questions:** a) Compare OSI and TCP/IP models in terms of modularity and implementation.  b) Identify which layers are most relevant for router and switch configurations.  c) Explain how protocol standardization supports network scalability.  d) Suggest two open-source tools for simulating protocol stack behaviour. |
| 2 | 192511137 | ARSHIYA A | **Network Hardware Integration**  **Scenario:** An IT firm wants to deploy hardware that supports 24/7 access with minimal downtime.  **Questions:**  a) Distinguish between active and passive network hardware.  b) Analyze how switches and hubs affect data collision domains.  c) Recommend backup hardware strategies for uninterrupted service.  d) Compare managed vs. unmanaged switches for scalability. |
| 3 | 192571057 | B S JAYANISANTH | ****Transmission Media Deployment**** **Scenario:** A financial institution is constructing a secure data center across two locations.  **Questions:** a) Compare UTP, STP, and Fiber Optic cables for secure data transmission. b) Evaluate the impact of EMI on copper-based media. c) Recommend cabling standards for backbone infrastructure.  d) Explain how media type influences bandwidth and latency. |
| 4 | 192511160 | BANDREDDY MOKSHASREE | ****Wireless and Wired Comparison**** **Scenario:** A smart building integrates both wired and wireless connections for IoT sensors.  **Questions:** a) Compare the advantages and disadvantages of wireless vs. wired communication.  b) Suggest a suitable transmission medium for indoor sensor networks.  c) Analyze the interference challenges in wireless media. d) Describe the role of access points in maintaining signal strength. |
| 5 | 192572085 | CHAKALI MANOJ | ****Network Topology Planning**** **Scenario:** A start-up wants a flexible internal network that supports frequent hardware changes.  **Questions:** a) Compare bus, star, and mesh topologies in terms of reliability and scalability. b) Explain why mesh topology is preferred in mission-critical systems.  c) Suggest hybrid topology use in large enterprises.  d) Recommend a simulation tool to test different topologies. |
| 6 | 192524260 | CHILLA PAVANI | ****Protocols and Standards Application**** **Scenario:** A company must comply with international communication standards during a cloud migration.  **Questions:** a) Define the role of protocols and standards in data communication.  b) Compare HTTP, FTP, and SMTP based on their OSI layer positions.  c) Justify the use of proprietary protocols in secured environments.  d) Suggest industry-standard protocols that ensure interoperability. |
| 7 | 192525115 | CHINNA THUMBALAM MOHAMMED UBED | ****Ethernet Setup in Multi-floor Buildings**** **Scenario:** An office with 10 floors requires a reliable Ethernet-based LAN.  **Questions:** a) Describe Ethernet interface standards like 10Base-T and 1000Base-LX.  b) Explain the role of MAC addressing in Ethernet networks.  c) Evaluate the difference between half-duplex and full-duplex Ethernet.  d) Recommend switch configurations to reduce congestion. |
| 8 | 192511139 | DHANSHIKA R A | ****Error Detection and Control**** **Scenario:** A large healthcare system must ensure error-free medical record transmission.  **Questions:** a) Why is error detection vital in healthcare networks?  b) Compare parity check, checksum, and CRC for error detection.  c) Discuss the limitations of parity in high-speed data transmission.  d) Recommend a robust error control strategy for large-scale hospital networks. |
| 9 | 192521216 | DHARSHAN SRINATH S | ****5G Integration in Modern Communication**** **Scenario:** A smart city is rolling out 5G for enhanced public services.  **Questions:** a) List the communication improvements brought by 5G.  b) Compare 5G with previous wireless generations.  c) Discuss how 5G supports ultra-reliable low latency communication (URLLC).  d) Suggest use cases for 5G in healthcare, education, and governance. |
| 10 | 192525228 | DUNNAPOTHULA NAGA BABU | ****Media Selection for Remote Work Infrastructure**** **Scenario:** A company expands remote work by building robust VPN and network infrastructure.  **Questions:** a) Compare broadband, leased lines, and fiber for remote access.  b) Discuss the role of VPN protocols in secure remote communication.  c) Evaluate latency and jitter in various transmission media.  d) Recommend backup links for remote operations. |
| 11 | 192511164 | FURTHOSE SAMREEN S | ****Wired Network in High-Rise Apartments**** **Scenario:** A smart apartment complex needs centralized Internet, CCTV, and IoT control through wired connections.  **Questions:** a) Compare the performance of CAT5e, CAT6, and CAT7 cables.  b) Identify challenges in routing cables vertically across floors. c) Recommend ways to minimize signal attenuation in long cable runs. d) Suggest structured cabling standards for such installations. |
| 12 | 192525082 | GANGAVARAPU ABHINAY REDDY | ****Configuring LAN for a Call Center**** **Scenario:** A call center wants to implement a fault-tolerant, scalable LAN setup.  **Questions:** a) Propose a suitable topology and justify your choice.  b) Explain the configuration of network interface cards (NICs).  c) Evaluate the need for VLANs in such environments.  d) Suggest Layer 2 and Layer 3 devices required. |
| 13 | 192511093 | JANANI SRI R | ****Network Software Stack for a Hybrid Cloud**** **Scenario:** A data analytics company is migrating to a hybrid cloud setup.  **Questions:** a) Describe the role of OSI and TCP/IP layers in cloud communication.  b) Compare software-based and hardware-based firewalls.  c) Suggest protocol-level security measures.  d) Recommend monitoring tools for each OSI layer. |
| 14 | 192524224 | K BHASHITHA | ****Building a SOHO Network**** **Scenario:** A small office/home office (SOHO) setup requires reliable but affordable networking.  **Questions:** a) List essential hardware and software components.  b) Compare DSL and fiber broadband for SOHO.  c) Describe the purpose of NAT in small networks. d) Recommend security measures suitable for SOHO. |
| 15 | 192511125 | K RITHIKA | ****15. Backbone Cabling for College Campus**** **Scenario:** A college needs high-speed backbone connectivity among departments.  **Questions:** a) Propose a transmission media for the backbone.  b) Compare single-mode vs. multi-mode fiber optic cables.  c) Explain the use of media converters in interconnecting buildings.  d) Recommend a redundancy strategy for backbone failure. |
| 16 | 192512093 | KAMALI S I | ****IoT Device Connectivity in Agriculture**** **Scenario:** A smart farm uses sensors and IoT devices for automation.  **Questions:** a) Compare LoRa, ZigBee, and Wi-Fi for sensor communication.  b) Identify suitable physical layer standards for rural settings. c) Discuss energy efficiency in wireless transmission. d) Recommend a gateway device to connect sensors to the cloud. |
| 17 | 192525075 | KOTHAKOTA RAKESH | ****Topology for Online Exam Centers**** **Scenario:** An education board sets up online exam centers across districts.  **Questions:** a) Choose a topology with minimal failure points.  b) Justify central vs. distributed control for exam data flow.  c) Recommend error detection for exam submission packets.  d) Suggest protocols that support time-sensitive data delivery. |
| 18 | 192524247 | KUNATI SAI LIKHITH | ****Industrial Control System Networks**** **Scenario:** A manufacturing plant uses automation and robotics over LAN.  **Questions:** a) Identify suitable transmission media resistant to interference.  b) Describe the role of the physical layer in PLC communication.  c) Recommend error control methods for real-time data.  d) Compare Modbus and Ethernet/IP protocols for automation. |
| 19 | 192524071 | LATISHA S | ****High-Speed Internet in a Sports Stadium**** **Scenario:** A stadium offers Wi-Fi to thousands of attendees.  **Questions:** a) Discuss wireless interference challenges in dense environments.  b) Recommend wireless standards (e.g., 802.11ax) for high-speed access.  c) Evaluate antenna placement for signal coverage.  d) Suggest load balancing methods for simultaneous connections. |
| 20 | 192565040 | LOGESHWARI S | ****Remote Healthcare Unit Deployment**** **Scenario:** A hospital wants to connect a mobile unit in a rural area.  **Questions:** a) Compare satellite vs. 4G/5G for rural communication. b) Evaluate error tolerance for transmitting medical data.  c) Suggest a compact networking setup for mobile vans. d) Recommend encryption standards for patient data. |
| 21 | 192521170 | LOKESH KUMAR V | ****Real-Time Stock Market Network**** **Scenario:** A stock exchange needs ultra-low latency networks.  **Questions:** a) Compare copper and fiber in terms of latency.  b) Explain jitter and its effect on financial data.  c) Suggest a Layer 1 optimization for speed.  d) Recommend high-speed media with redundancy. |
| 22 | 192525107 | M HEMANTH KUMAR | ****Communication in Emergency Response Systems**** **Scenario:** A city emergency system coordinates fire, ambulance, and police.  **Questions:** a) Evaluate wired vs. wireless for field communication.  b) Suggest an error control method in mobile data communication.  c) Recommend protocols suitable for emergency prioritization.  d) Compare GSM and LTE in disaster zones. |
| 23 | 192511178 | MOHAMED SYED THOWFIQ S | ****Secure Government Building Network**** **Scenario:** A government agency requires highly secure internal communication.  **Questions:** a) Describe the role of encryption at the physical layer.  b) Compare Tunneling and VPN for internal communication.  c) Identify standard-compliant secure transmission media.  d) Recommend error detection and correction strategies. |
| 24 | 192521220 | MOHAMMAD ALEYAS | ****Energy-Efficient Communication in Smart Grids**** **Scenario:** A smart grid system transmits sensor data frequently.  **Questions:** a) Identify power-efficient transmission media.  b) Suggest error detection methods for analog data.  c) Compare ZigBee and cellular for energy usage.  d) Propose a topology for smart meter networks. |
| 25 | 192511188 | MOUNNILA S P | ****25. Configuring a Secure Wi-Fi Network in Airports**** **Scenario:** An airport offers Wi-Fi while protecting users from threats.  **Questions:** a) Recommend secure Wi-Fi protocols. b) Explain SSID broadcasting and hiding. c) Suggest suitable frequencies and bands to avoid congestion.  d) Evaluate captive portal authentication mechanisms. |
| 26 | 192525059 | MUSTURI BALAJI | ****Metro Rail Communication Setup**** **Scenario:** A metro network uses real-time communication between stations.  **Questions:** a) Identify a topology for real-time communication.  b) Recommend wireless standards with minimal delay.  c) Suggest redundant physical links.  d) Compare public and private communication infrastructure. |
| 27 | 192572086 | NITYA PRIYA P M | ****Cross-Border Corporate WAN Setup**** **Scenario:** A company connects offices across countries.  **Questions:** a) Compare leased lines, MPLS, and VPN.  b) Explain latency concerns in global transmission.  c) Suggest compression techniques for bandwidth.  d) Recommend error control for long-distance links. |
| 28 | 192524244 | NUHA FATHIMA H | ****Network Design for R&D Lab**** **Scenario:** A research lab needs high-speed and high-security networking.  **Questions:** a) Choose an ideal media type for high-bandwidth.  b) Compare SSH and Telnet for remote access. c) Recommend layered firewall implementation. d) Suggest structured cabling for lab setup. |
| 29 | 192524072 | PRASHANTH G | ****Cloud Storage Data Center Network**** **Scenario:** A cloud storage provider deploys a new data center.  **Questions:** a) Suggest topology that supports scalability.  b) Compare SAN and NAS over different media.  c) Recommend media type for internal data flow. d) Explain the role of physical layer in storage replication. |
| 30 | 192525231 | PRATTIPATI HASINI | ****Intelligent Transportation System**** **Scenario:** A city deploys smart traffic control using sensors.  **Questions:** a) Recommend topology for real-time traffic data.  b) Evaluate wireless media for traffic sensors.  c) Suggest a protocol for real-time signal updates.  d) Compare 4G and 5G for vehicular communication. |
| 31 | 192524267 | RIFA FATHIMA S | ****Industrial IoT in Oil Refineries**** **Scenario:** Sensors in hazardous environments must report data reliably.  **Questions:** a) Identify robust transmission media in high-temperature zones.  b) Recommend media shielding techniques.  c) Suggest an error detection mechanism for analog signals.  d) Compare Modbus TCP vs MQTT. |
| 32 | 192511104 | S LEKHA | ****Configuring Public Wi-Fi in Libraries**** **Scenario:** A municipal library installs public Wi-Fi.  **Questions:** a) Compare open access vs password-secured networks.  b) Recommend filtering tools for public networks.  c) Suggest optimal router placement for signal coverage.  d) Explain how to prevent rogue access points. |
| 33 | 192525222 | SAKA CHANDRA SIDDHARDHA | ****Drone Communication in Logistics**** **Scenario:** A delivery company uses drones for urban logistics.  **Questions:** a) Identify suitable frequency bands for drone control.  b) Evaluate interference issues in urban skies.  c) Recommend a protocol for command-and-control messages.  d) Suggest a topology to manage multiple drones. |
| 34 | 192511172 | SAMRAKSHINI G | ****Voice Communication in Enterprises (VoIP)**** **Scenario:** A firm uses VoIP for all internal communication.  **Questions:** a) Compare traditional telephony vs. VoIP on OSI layers.  b) Recommend protocols for voice over IP.  c) Explain jitter buffer and its need.  d) Suggest error recovery for voice packets. |
| 35 | 192521169 | SARATH B | ****Autonomous Vehicle Network Requirements**** **Scenario:** Self-driving cars rely on vehicle-to-vehicle (V2V) communication.  **Questions:** a) Describe transmission requirements for V2V.  b) Compare DSRC and C-V2X.  c) Suggest media types for in-car networks.  d) Recommend latency control techniques. |
| 36 | 192521204 | SHAROON STONE M | ****Cross-Floor Cabling in Hospitals**** **Scenario:** A hospital installs new LAN connections across six floors.  **Questions:** a) Suggest safe cable routing practices.  b) Recommend redundancy for life-critical systems.  c) Evaluate the use of fiber in hospitals.  d) Compare cable trays and conduit systems. |
| 37 | 192572096 | SHRAAVANI N | ****AI Surveillance System Network**** **Scenario:** A city installs real-time surveillance with AI analytics.  **Questions:** a) Recommend a media type for video transmission.  b) Compare wired and wireless camera setups.  c) Suggest data compression for surveillance footage.  d) Propose network storage options. |
| 38 | 192525060 | SYED ARSHAD | ****Virtual Reality Lab Setup**** **Scenario:** A VR lab needs high-speed and low-latency networking.  **Questions:** a) Choose a physical medium for VR transmission.  b) Discuss latency issues in immersive systems.  c) Suggest protocols for VR data. d) Recommend cabling for multiple VR workstations. |
| 39 | 192572091 | TALARI VISHNUVARDHAN | ****Smart Retail Store Networking**** **Scenario:** A smart retail outlet uses sensors and payment terminals.  **Questions:** a) Recommend a secure topology for PoS devices.  b) Compare Bluetooth and Wi-Fi for in-store sensors.  c) Suggest backup options during network outages.  d) Recommend a protocol stack for real-time updates. |
| 40 | 192524236 | THANUSHREE P | ****Telemedicine Network Setup********Scenario:**** A hospital connects rural patients with specialists via video.Questions: a) Recommend bandwidth for HD video consultations.  b) Compare DSL and 5G for telemedicine.  c) Evaluate media for reliability in rural settings. d) Suggest video compression and encryption standards. |