**Exam.Code: 0999**
**Sub. Code: 34978**

2124

**M.E. Computer Science and Engineering**
**First Semester**
**CS-8103: Advanced Computer Networks**
**(For UIET only)**
**(Common with ME Comp. Sci Cyber Security CSN 8102)**

**Time allowed: 3 Hours** **Max. Marks: 50**

*NOTE: Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions from each Section B-C. Any missing or misprinted data maybe assumed suitably. All questions carry 10 marks.*

*x-x-x*

## Section-A

1. (a) What are the main differences between the ISO-OSI and TCP/IP reference models?
   (b) Explain the concept of Software Defined Networking (SDN).
   (c) What is the purpose of TCP extensions in wireless networks? Name one issue that conventional TCP faces in wireless networks.
   (d) How does the architecture of GSM ensure reliability and scalability in large networks?
   (e) What are the primary factors affecting TCP throughput in mobile environments?

## Section-B

2. Design a scenario where IPv6 Neighbor Discovery Protocol (NDP) could fail due to security vulnerability. Propose a mitigation strategy to address the identified issue.
3. What is Mobile IPv6? Discuss how route optimization works and its impact on transport layer protocols like TCP and UDP.
4. Explain the network architecture of GPRS and analyze its data services and applications. What are the key limitations of GPRS?

## Section-C

5. Conventional TCP struggles in wireless environments due to frequent packet loss. Explain TCP extensions like TCP-SACK and TCP-Vegas in justifying these issues. Which is more suitable for high-speed, lossy wireless networks? Justify your answer.
6. Analyze the role of SDN controllers in modern networks. Provide examples of application areas where SDN is transforming network management and efficiency.
7. Evaluate the impact of cell splitting and sectoring on network interference and overall system capacity. Use mathematical models to demonstrate how the changes influence frequency reuse and signal quality.

*x-x-x*