



Faculty of Information Technology
MSC in Information Systems Security
End of Semester Examination
MST 8104 Software Laboratory Experience II

DATE: 28th APRIL 2026

Time: 2 Hours

Instructions

- This examination consists of **SIX** questions.
- Maximal points for the examination is **50**.

- 1) Explain the following terms. Describe how these technologies are used in computer networks. If relevant, give an example of protocol commands, protocol addresses etc. (9 points)

SLAAC

Go-back-N

ULA

- 2) Explain what is a digital signature and how it protects communication. Describe how is the signature generated and verified. Give an example of at least two algorithms used for generation of digital signatures. Define what is a digital certificate, what it includes, and how is related to the signature? (9 points)
- 3) Explain how concurrent TCP server is implemented using BSD socket library. Give a right sequence of socket functions and functions for parallelization that will be used. Describe these functions. (7 points)
- 4) Create DNS records of type A, AAA, NS, MX, SRV, and CNAME for the domain *fit.strathmore.ke*. Assume the IPv4 address space 10.1.1.0/24 and the IPv6 address space fd02:865::/64. Explain the function of each type of record created. Exact format of DNS format is not required. (7 points)
- 5) Explain multicast communication. How nodes connect to a multicast group? How multicast can be implemented using BSD sockets? How multicast address 224.10.10.1 will be mapped to L2 multicast? (9 points)

6) Describe the following parts of the SNMP monitoring system. (9 points)

SNMP Object (definition, format, addressing, example)

SNMP Protocol (type of communication, protocol format, SNMP commands)

SNMP Security