Code No: 157HJ

**R18**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B. Tech IV Year I Semester Examinations, February - 2025**
**NETWORK MANAGEMENT SYSTEMS AND OPERATIONS**
**(Computer Science and Engineering - Cyber Security)**

**Time: 3 Hours** **Max. Marks: 75**

**Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART – A**

**(25 Marks)**

| | | |
|---|---|---|
| 1.a) | Define DSLAM in the context of DSL modem systems. | [2] |
| b) | Briefly describe the function of a DHCP server in a network. | [3] |
| c) | What is the purpose of using default values in configuration management? | [2] |
| d) | List and define the key motivations for automating network management. | [3] |
| e) | What is the 50/80 rule in anomaly detection? | [2] |
| f) | Differentiate between alarms, logs, and polling in fault management. | [3] |
| g) | How do resource limits relate to Denial-of-Service (DoS) attacks? | [2] |
| h) | Discuss the concept of "security as a process". | [3] |
| i) | What is Google Cloud Network? | [2] |
| j) | Compare the functionalities of Zabbix and Nagios for network monitoring. | [3] |

**PART – B**

**(50 Marks)**

2.a) Explain the role of policies (internal and external) in managing an entity within a network.
b) Illustrate the working of an IP router with a diagram. [5+5]

**OR**

3. Explain the structure of the internet and how it affects the management of network elements and services. [10]

4.a) Evaluate the benefits and limitations of automated rollback and timeout mechanisms in network configuration.
b) How does the separation of setup and activation improve configuration management? [5+5]

**OR**

5.a) Explain how scale and complexity affect network management, providing examples from real-world scenarios.
b) Explain the relationship between configuration, global state, and practical systems.[5+5]

6.a) Describe the process of capacity planning in a complex network topology.
b) Illustrate how bottleneck analysis is used to optimize network performance. [5+5]

**OR**

7.a) Evaluate the impact of human error on network faults and the strategies to mitigate it.
b) How do active probing and passive observation differ in performance assessment? [5+5]

8.a) Analyze the challenges in managing the security of wireless networks.
b) Discuss the significance of security policies in managing a secure network environment. [5+5]

**OR**

9.a) Provide an in-depth analysis of Role-Based Access Control (RBAC) and its benefits in network security.
b) What the advantages and challenges of using a separate network for management traffic, including NOCs and remote monitoring? [5+5]

10.a) How does Nagios manage distributed monitoring?
b) Evaluate the pros and cons of using Zabbix Labs for enterprise network monitoring. [5+5]

**OR**

11. Describe a case study or scenario where Google Cloud Network and Terraform were used together for a successful network setup. [10]

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