

BINDURA UNIVERSITY OF SCIENCE EDUCATION  
FACULTY OF SCIENCE AND ENGINEERING  
DEPARTMENT OF COMPUTER SCIENCE  
BSc HONS DEGREE IN INFORMATION TECHNOLOGY  
NWE402/IT402 ADVANCED NETWORK MANAGEMENT

2 HOURS 30 MINS

Total Marks is 100

OC / 2024

**Instructions to candidates:**

Answer all questions.

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**Question 1**

Network management is tasked with controlling network resources, coordinating network services, monitoring network states, and reporting network status and anomalies. Explain any **four** objectives of network management [20]

**Question 2**

Muyambo Investments is experiencing significant network congestion during peak hours, resulting in poor performance for employees. As a network manager, you have been tasked with improving network performance. Describe the steps that you would take to improve network performance. [20]

**Question 3**

With the expansion of networks, the evolution of network architectures, and the increasing requirements for network management, network management protocols also evolved consequently. A typical management network system will make use of the management operation services to monitor network elements. Management agents found on network elements will make use of the management notification services to send notifications or alarms to the network management system. Network management protocols are used to define how network management information is exchanged between network management services and management agents. Explain how the following network management protocols work.

- i. Common Management Information Protocol (CMIP) [5]
- ii. Simple Network management Protocol (SNMP) [5]
- iii. Internet Protocol Flow Information Export (IPFIX) [5]
- iv. Network Configuration Protocol (NETCONF) [5]

#### **Question 4**

FCAPS is the ISO Telecommunications Management Network model and framework for network management. FCAPS model is useful for understanding the goals and requirements of Network Management, and also helps to build a foundation for understanding the significance of Network Management to compliance efforts. Explain the following management categories into which the ISO model defines network management tasks.

- i. Fault Management [4]
- ii. Configuration Management [4]
- iii. Accounting Management [4]
- iv. Performance Management [4]
- v. Security Management [4]

#### **Question 5**

- a) Mabhouwa Pvt Ltd has identified several security vulnerabilities in their network infrastructure. As a network manager, your goal is to enhance network security and protect the company's data. Outline the steps that you would follow to enhance the network security of this organisation [10]
- b) When choosing a network monitoring tool for your business, there are several factors to consider to ensure you select the best fit for your specific needs. Explain the different factors that the network manager should consider. [10]

\*\*\*\*\*END OF EXAM\*\*\*\*\*