PLANIT TEACHERS

Computer Systems Fundamentals Assessment

Learning Objectives

- Demonstrate comprehensive understanding of computer hardware architecture
- Analyze and evaluate system performance characteristics
- Design and document network infrastructure solutions
- Apply troubleshooting methodologies to complex systems

Part 1: Hardware Architecture Analysis (45 minutes)

Complete the following tasks with detailed explanations and diagrams where required.

Task 1.1: Component Identification

Study the motherboard diagram below and complete the following:

Component	Primary Function
CPU Socket	
RAM Slots	
PCIe Slots	
BIOS Chip	

Task 1.2: System Performance Analysis

Given the following system specifications, analyze potential bottlenecks:

- CPU: Intel Core i7-11700K (8 cores, 3.6GHz base)
- RAM: 16GB DDR4-3200
- Storage: 1TB NVMe SSD
- GPU: NVIDIA RTX 3070 8GB

Complete the analysis table:

Workload Type	Potential Bottleneck	Justification
4K Video Editing		

Virtual Machine Hosting		
Machine Learning Tasks		

Part 2: Data Flow Mapping (30 minutes)

Create a detailed data flow diagram showing the interaction between system components during a file save operation.

Task 2.1: Component Interaction Analysis

In the space below, draw and label the data flow between components:

[Drawing Space for Data Flow Diagram]

Explain the sequence of events:

1. Initial request handling:

2. Memory management:

3. Storage operations:

4. Completion verification:

Part 3: Software Systems Analysis (40 minutes)

Task 3.1: Software Classification

Categorize the following software and explain your classification:

Software	Category	Justification
Adobe Photoshop		
BIOS/UEFI		
Device Drivers		

Task 3.2: Operating System Comparison

Complete the comparison matrix for Windows and Linux:

Feature	Windows	Linux
Architecture		
Security Model		
Resource Management		

Part 4: Network Infrastructure Design (45 minutes)

Task 4.1: Network Topology Design

Design a network infrastructure for a medium-sized business with the following requirements:

- 100 workstations across 3 floors
- Secure server room
- VoIP phone system
- Guest WiFi network
- Remote access capabilities

[Network Diagram Space]

Network Segment	IP Range	Security Measures
Staff Network		
Server Network		
Guest Network		

Part 5: System Security Implementation (40 minutes)

Task 5.1: Security Policy Development

Create a comprehensive security policy addressing the following areas:

Access Control Policy

Define access control measures for:

1. Physical access to server rooms:

_____

2. Network resource access:

_____

3. Remote access protocols:

_____

Data Protection Measures

Data Classification	Protection Requirements	Implementation Method
Confidential		
Internal Use		
Public		

Part 6: System Troubleshooting (35 minutes)

Task 6.1: Problem-Solving Scenarios

Analyze the following scenarios and provide detailed troubleshooting steps:

Scenario 1: Network Connectivity Issues

Users report intermittent network connection drops during peak hours.

Step	Action	Expected Outcome
1		
2		
3		

Scenario 2: System Performance Degradation

A critical database server is experiencing slow response times.

Possible Cause	Diagnostic Steps	Resolution
Resource Exhaustion		
Storage Issues		
Network Bottleneck		

Part 7: System Documentation (30 minutes)

Task 7.1: Documentation Development

Create system documentation for the following components:

Hardware Inventory Documentation

Component Type	Specifications	Maintenance Schedule
Servers		
Network Equipment		
Storage Systems		

Backup and Recovery Procedures

1. Backup Schedule:

2. Recovery Time Objectives:

3. Disaster Recovery Steps:

Assessment Completion

Final Notes:

- Ensure all diagrams are clearly labeled and annotated
- Review your answers for completeness and accuracy
- Submit all pages together in the correct order

Submission Details

Student Name:	
Student ID:	
Date:	

Examiner's Use Only

Section	Maximum Mark	Mark Awarded
Part 1: Hardware Architecture	30	
Part 2: Data Flow Mapping	25	
Part 3: Software Systems	25	
Total	**80**	

Examiner's Comments: