



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF INFORMATION TECHNOLOGY

FINAL TEST
MARCH 2026 SEMESTER

COURSE CODE : IKB10403
COURSE NAME : IT SECURITY ESSENTIALS
PROGRAMME NAME : BACHELOR OF INFORMATION TECHNOLOGY
(FOR MPU: PROGRAMME LEVEL) (HONS.) IN COMPUTER SYSTEMS SECURITY
DATE : 25 JUNE 2026
TIME : 9:00 AM – 11:00 AM
DURATION : 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
 2. This question paper has information printed on both sides of the paper.
 3. This question paper consists of **TWO (2)** sections: Section A and Section B.
 4. Answer **ALL** questions in Section A and Section B.
 5. Please write your answers on the answer booklet provided.
 6. Answer all questions in English language **ONLY**.
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THERE ARE 9 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 30 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

1. An organization stores customer records in a database. These records are classified as:
 - A. Hardware assets
 - B. Software assets
 - C. Information assets
 - D. Communication assets
2. A company plans to upgrade its operating system to improve security. This is an example of managing:
 - A. Information assets
 - B. Software asset
 - C. Hardware asset
 - D. Network asset
3. A business purchases a new human resource management information system (HRMS). Which asset category does the HRMS belong to?
 - A. Hardware
 - B. Information
 - C. Software
 - D. Network
4. A company experiences data loss after several employee laptops containing confidential customer information are stolen. Which security control would **BEST** reduce the risk of unauthorized access to the stolen data?
 - A. Encrypting the data stored on the laptops
 - B. Installing antivirus software on the laptops
 - C. Implementing regular data backups to a secure server
 - D. Upgrading the laptops to a newer operating system

5. An organization wants employees to securely access company applications and information using smartphones while travelling or working remotely. Which technology **MOST** directly supports this capability?
- A. Mobile technology
 - B. Internet of Things (IoT) technology
 - C. Cloud computing technology
 - D. Local Area Network (LAN) technology
6. A smart thermostat automatically adjusts room temperature based on sensor readings. This is an example of:
- A. Cloud computing
 - B. Information assets
 - C. Internet of Things (IoT)
 - D. Cryptography
7. A logistics company installs GPS trackers on delivery vehicles to monitor locations in real time. This application demonstrates:
- A. Software piracy
 - B. Internet of Things (IoT) technology
 - C. Topology design
 - D. Cryptanalysis
8. An environmental agency deploys IoT devices to monitor air quality and temperature in multiple locations. Which characteristic is **MOST** important for these IoT devices?
- A. The ability to automatically collect and transmit sensor data in real time
 - B. The ability to process complex graphical applications locally
 - C. The availability of large storage capacity for multimedia files
 - D. The ability to support multiple users through a graphical interface
9. A mesh topology is preferred when:
- A. Low reliability is acceptable
 - B. Maximum fault tolerance is required
 - C. Only one computer exists
 - D. Cabling must be minimized

10. A company has branches located in different countries connected through the Internet. Which network type is used?
- A. Personal Area Network (PAN)
 - B. Local Area Network (LAN)
 - C. Metropolitan Area Network (MAN)
 - D. Wide Area Network (WAN)
11. In a star topology, if the central switch fails, what is the likely impact?
- A. Only one device stops working
 - B. Entire network communication is disrupted
 - C. No effect on the network
 - D. Only wireless devices are affected
12. UniKL chooses a bus topology for its campus network. Which reason **BEST** justifies this decision?
- A. It is cost-effective because all devices can share a single communication cable.
 - B. It provides the highest fault tolerance because multiple communication paths exist between devices.
 - C. It allows each device to connect directly to a central switch for easier management.
 - D. It ensures that network communication continues even if the main cable fails.
13. Unauthorized disclosure of examination questions violates:
- A. Confidentiality
 - B. Integrity
 - C. Availability
 - D. Reliability
14. A server outage prevents users from accessing online services. Which CIA triad has been compromised?
- A. Confidentiality
 - B. Integrity
 - C. Availability
 - D. Authentication

15. A company's payroll database contains incorrect salary information after an unauthorized modification was made to several records. Which component of the CIA Triad should the company focus on restoring?
- A. Confidentiality
 - B. Availability
 - C. Integrity
 - D. Accessibility
16. Which action best supports information confidentiality??
- A. Regular system backup
 - B. Data encryption
 - C. Hardware replacement
 - D. Network expansion
17. A company performs daily backups of critical databases. This practice mainly supports:
- A. Availability
 - B. Confidentiality
 - C. Encryption
 - D. Topology
18. An organization discovers that employees frequently share their login credentials with colleagues to access confidential customer records. As a security consultant, which assessment **BEST** explains why this practice should be prohibited?
- A. It reduces network performance and increases bandwidth consumption.
 - B. It compromises confidentiality by allowing unauthorized access and weakens accountability for user actions.
 - C. It prevents the organization from expanding its information systems.
 - D. It decreases the availability of information to legitimate users.
19. An organization encrypts sensitive customer information before storing and transmitting it over a network. What is the **PRIMARY** purpose of using cryptography in this situation?
- A. To protect information from unauthorized access and disclosure
 - B. To improve the speed of data transmission across the network
 - C. To reduce the amount of storage space required for data files
 - D. To increase the processing performance of information systems

20. Plaintext refers to:
- A. Encrypted information
 - B. Decrypted message
 - C. Original readable message
 - D. Secret key
21. If a message is converted into unreadable form during transmission, the result is known as:
- A. Plaintext
 - B. Ciphertext
 - C. Password
 - D. Hash
22. Which cryptographic technique uses the same key for encryption and decryption?
- A. Symmetric encryption
 - B. Asymmetric encryption
 - C. Hashing
 - D. Digital signature
23. Which cryptographic technique uses a public key and a private key?
- A. Symmetric encryption
 - B. Substitution cipher
 - C. Asymmetric encryption
 - D. Compression
24. A company wants to verify that a file received from a remote office has not been modified during transmission. Which technique is **MOST** suitable?
- A. Symmetric encryption
 - B. Asymmetric encryption
 - C. Hashing
 - D. Access control

25. An organization experiences a cyberattack that compromises several IT assets. The management determines that the greatest business impact resulted from the loss of customer records, transaction histories, and sales reports. Based on this analysis, which asset category suffered the most significant loss?
- A. Hardware assets
 - B. Network assets
 - C. Information assets
 - D. Communication assets
26. An organization implements smart sensors to automatically monitor machine conditions. This initiative is an example of:
- A. IoT deployment
 - B. Software licensing
 - C. LAN configuration
 - D. File compression
27. A hospital requires patient records to be available 24 hours a day. Which CIA triad is most critical?
- A. Confidentiality
 - B. Availability
 - C. Encryption
 - D. Authentication
28. Which network topology provides multiple paths between devices and improves fault tolerance?
- A. Bus
 - B. Star
 - C. Ring
 - D. Mesh
29. A manager receives an encrypted email and successfully decrypts it using a private key. Which cryptographic method is **MOST** likely being used??
- A. Symmetric encryption, where the same secret key is shared between sender and receiver
 - B. Asymmetric encryption, where a public key encrypts the message and a private key decrypts it
 - C. Hashing, where a fixed-length digest is generated to verify integrity

- D. Substitution cipher, where each letter is replaced with another character based on a pattern
30. An organization wants to protect its customer database from unauthorized access, accidental modification, and data loss. Which combination of controls would **BEST** address these security requirements?
- A. Encryption, access control, and regular backups
 - B. Firewall configuration, network topology redesign, and hardware upgrades
 - C. Strong passwords, faster internet connectivity, and cloud storage expansion
 - D. Antivirus software, software updates, and increased storage capacity

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SECTION B (Total: 50 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****QUESTION 1 (25 marks)**

A smart farming company uses IoT technology to monitor soil moisture, temperature, and crop conditions. Sensors installed in the farm automatically collect and transmit data to a cloud-based monitoring system. Farm managers can access the information using mobile devices.

- (a) Identify and briefly explain **TWO (2)** hardware assets and **TWO (2)** information assets involved in the smart farming system.

(8 marks)

- (b) Explain **THREE (3)** ways IoT technology can improve farming operations. Provide an example for each.

(9 marks)

- (c) The farm network currently uses star topology. Analyze **TWO (2)** advantages and **TWO (2)** disadvantages of using a star topology in this situation.

(8 marks)

QUESTION 2 (25 marks)

An online shopping company stores customer information such as names, addresses, and payment information, and processes thousands of online transactions daily. To protect sensitive information, the company implements encryption technologies and security controls.

(a) Classify the following as Confidentiality, Integrity, or Availability requirements and justify your answer:

- i. Only authorized employees can access payment information.
- ii. Transaction records must not be altered without authorization.
- iii. Customers should be able to access the online store at all times.

(9 marks)

(b) The company wants to protect sensitive information before transmitting it over the network. Using the Rail Fence Cipher technique with 3 rails, encrypt the following plaintext:

User Id Secured

Before encryption, remove the spaces and convert the text to uppercase.

Show all steps of the encryption process and provide the final ciphertext.

(7 marks)

(c) The company is considering different cryptographic techniques to secure customer information.

Compare symmetric encryption, asymmetric encryption and hashing in terms of:

- i. Purpose
- ii. Keys used
- iii. Security applications

(9 marks)

END OF QUESTION