MINISTRY OF EDUCATION AND TECHNICAL EDUCATION

وزارة التربية والتعليم والتعليم الفني

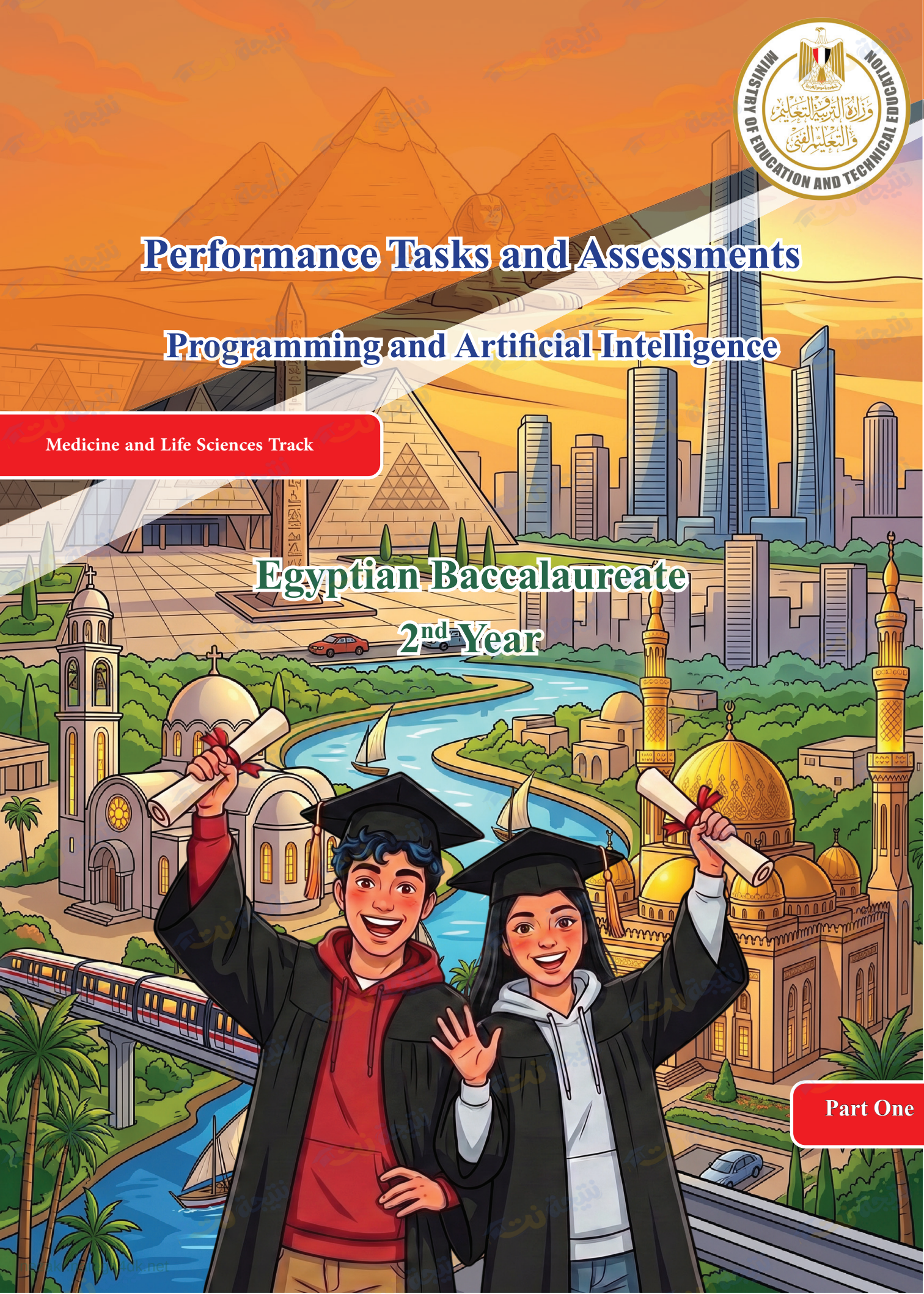
Performance Tasks and Assessments

Programming and Artificial Intelligence

Medicine and Life Sciences Track

Egyptian Baccalaureate

2nd Year



Part One

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Introduction

The Ministry of Education and Technical Education continues its steady steps toward developing the Egyptian education system, transitioning it from the realm of rote learning and mechanical memorization to the broader horizons of deep understanding, critical thinking, and comprehensive skill-building.

In this context, we are pleased to present to our students, esteemed colleagues among teachers, and respected parents the **"Performances and Assessments"** book. It has been prepared using an integrated methodological approach to serve as a practical assistant and field companion throughout the semester.

This book has been designed to be an effective practical tool that translates the goals of the modern educational system into real-world practices inside and outside the classroom through three main pillars that achieve integration in the educational process:

1. **Classroom Performances (Continuous Formative Assessment):** These include diverse activities utilized by the teacher during instruction inside the classroom to enhance student interaction, provide continuous opportunities for formative assessment, directly gauge their progress, and identify points of strength and areas needing improvement. This helps in delivering appropriate feedback and timely support.
2. **Home Performances (Self-Mastery and Application):** A set of targeted activities and exercises designed to promote self-learning among students, check their understanding of concepts and mastery of skills learned in class, and apply them in new contexts to consolidate learning and deepen its impact.
3. **Weekly Assessments (Performance Measurement and Follow-Up):** Diverse assessment models conducted at the end of each week to help teachers and school management regularly track student progress and measure the achievement of targeted learning outcomes for what was covered during the week. This aids in identifying educational needs and taking supportive measures to improve learning.

At the same time, the book aims to engage parents as essential partners in the educational process. It enables them to carefully and consciously monitor their child's academic progress step-by-step, recognize strengths and areas requiring support, and provide guidance and assistance at the right time, rather than relying solely on end-of-term results.

The activities and questions in this book are directly linked to the targeted learning outcomes and feature a balanced variety of types and levels. They include both objective and essay questions, as well as various tasks designed to measure different levels of learning—ranging from recall, comprehension, and application to higher-order thinking skills such as analysis, critical thinking, problem-solving, formulating evidence-backed opinions, and creativity.

In conclusion, we pray that Almighty God makes this work a valuable aid for our students, a guiding light on their path toward excellence, and a support for our noble teachers in fulfilling their lofty mission.

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Unit One: Information Technology and Society

Lesson 1-1 Development of Information Technology and Social Transformation

First Period: ….	Week: …….	Date: …….

First: Performance Tasks

Essay Questions

1. Explain the development of information technology from the 1940s to the 1960s, highlighting its main uses during this period.

.....

2. Explain what is meant by “Moore’s Law.” Is it a fixed physical law? Explain your answer.

.....

Objective Questions (Multiple Choice)

1. Which of the following options represents the main technology or event associated with the 1970s and 1980s?

A. The emergence of smartphones
B. The widespread use of personal computers (PCs)
C. The spread of cloud computing
D. The availability of the Internet for commercial use and the emergence of the World Wide Web

2. What is the empirical observation that describes a historical trend in which the number of transistors in integrated circuits approximately doubles every two years?

A. Cloud computing
B. Moore’s Law
C. Edge computing
D. Quantum superposition

Second: Homework

Essay Questions

1. Mention three social changes resulting from information technology.

.....

2. What is meant by the term E-commerce? Explain your answer using two examples.

.....

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Objective Questions (Multiple Choice)

1. What term refers to a working style in which a person performs their tasks from home or another remote location using the Internet?

A. Online Learning
B. E-commerce
C. Remote Work
D. Cashless Payment

2. What is meant by "Social Networking Service" (SNS)?

A. Platforms that allow users to communicate, post and share information.
B. Buying and selling goods and services through the Internet.
C. Paying for goods or services using non-cash methods.
D. A learning style in which lessons are delivered online.

Second Period:	Week:	Date: .....

First: Performance Tasks

Essay Questions

1. Explain how Edge Computing enhances security and speeds up decision-making in autonomous driving technology without the need to send data to the cloud.

.....

2. Briefly compare Augmented Reality (AR) and Virtual Reality (VR) in terms of their definitions and how they work.

.....

Objective Questions (Multiple Choice)

1. Which technology processes data directly on the device instead of sending it to the cloud, in order to reduce delays in decision-making?

A. Cloud Computing
B. Quantum Computing
C. Edge Computing
D. Social Networking Services

2. Which of the following accurately describes Augmented Reality (AR)?

A. A technology that places the user in a completely computer-generated virtual environment.
B. A technology that adds digital elements or information to a real-world scene.
C. A computing style that uses the principles of quantum mechanics to process information.
D. A system for making payments using electronic money and QR codes.

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Second: Homework

Essay Questions

1. Explain the principle behind a (qubit) in quantum computing and how it differs from a classical bit.

.....

2. How has the spread of cloud computing since the second decade of the 21st century changed the way information technology resources are provided?

.....

Objective Questions (Multiple Choice)

1. What distinguishes a (qubit) from a classical bit in quantum computing?

A. It holds one definite state, either 0 or 1, at any given time.
B. It uses the principle of quantum superposition to exist as a combination of 0 and 1 at the same time.
C. It relies only on traditional integrated circuits and a stable electric current.
D. Its use is limited exclusively to simple calculations.

2. What is meant by "Cashless Payment"?

A. Buying and selling goods and services in physical stores using paper money.
B. Paying for goods or services using non-cash methods, such as cards, mobile applications, or QR codes.
C. Working from home using the Internet and email.
D. Providing lessons and study materials to users online.

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Third Period	Weekly Assessment	Week: …….	Date: …….

Model (A)

Essay Questions

1. Explain the historical stages of information technology evolution from the emergence of electronic computers in the 1940s through the 1960s, outlining the primary purpose of their use.

.....

2. Explain Moore's Law, describing what it refers to and the engineering and physical challenges that face the continued miniaturization of circuit components.

.....

3. List the five social transformations resulting from information technology. Explain the concepts of Remote Work and E-commerce.

.....

4. Explain the characteristics and uses of the three prominent emerging technologies mentioned in the lesson: autonomous driving, augmented/virtual reality, and quantum computing.

.....

Objective Questions (Multiple Choice)

1. During which period did the Internet become available for commercial use and the World Wide Web emerge, leading to wider global access to information?

A. The 1940s and 1960s
B. The 1990s
C. The 1970s and 1980s
D. From the second decade of the 21st century onward

2. Which technology uses artificial intelligence to assist in driving a vehicle by using cameras and sensors to perceive its surroundings and make decisions?

A. Cloud Computing
B. Autonomous Driving
C. Virtual Reality
D. Quantum Computing

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3. Which term refers to information technology resources provided as a service over the Internet to support big data analysis and artificial intelligence?

A. Cloud Computing
B. Edge Computing
C. Classical Bit
D. Quantum Superposition

4. Which of the following correctly describes Virtual Reality (VR)?

A. A technology that adds digital information to images of the real world.
B. A technology that places the user in a computer-generated virtual environment.
C. A technology that processes data directly on the device without using the cloud.
D. A system for making payments using electronic money and QR codes.

Model (B)

Essay Questions

1. Explain how the emergence of personal computers (PCs) and the spread of global access to information and email affected society during the 1970s and 1980s.

.....

2. Explain how the continued miniaturization of circuit components, as described by Moore's Law, leads to engineering and physical challenges such as leakage currents, quantum effects, and quantum tunneling.

.....

3. Briefly explain the concept of each of the following as social transformations: Social Networking Services (SNS), Online Learning, and Cashless Payment.

.....

4. Explain how Edge Computing processes data locally on board a self-driving vehicle in real time to reduce response time and ensure safety.

.....

Objective Questions (Multiple Choice)

1. The period that witnessed the emergence of smartphones and the rapid spread of mobile Internet was:

A. The 1960s and 1970s
B. The 2000s
C. The 1990s
D. The 1940s

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2. A technology that adds digital elements or information to a real-world scene is known as:

A. Virtual Reality (VR)
B. Autonomous Driving
C. Augmented Reality (AR)
D. Quantum Computing

3. Which of the following observations accurately describes what Moore's Law states?

A. The number of transistors in an integrated circuit approximately doubles every two years.
B. The number of transistors remains constant and never changes over time.
C. Power consumption in traditional computers doubles every year.
D. Computing and data-processing capabilities decrease over the years.

4. A learning and training style in which lessons and study materials are delivered entirely or partially over the Internet is called:

A. E-commerce
B. Remote Work
C. Online Learning
D. Cashless Payment

Model (C)

Essay Questions

1. Discuss the impact of the emergence of the World Wide Web and the spread of the Internet in the 1990s on making information available for commercial and global use.

.....

2. Explain why autonomous driving is considered one of the prominent emerging technologies.

.....

3. Explain the concepts of E-commerce and Cashless Payment.

.....

4. Explain the key differences between a classical bit and a qubit, using the concept of quantum superposition in quantum computing.

.....

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Objective Questions (Multiple Choice)

1. Electronic computers began to emerge and were mainly used for military purposes and scientific calculations, such as the ENIAC, which used vacuum tubes, during the:

A. 1940s
B. 1970s
C. 1990s
D. 2000s

2. A computing style that uses the principles of quantum mechanics to process information and may provide an advantage for certain types of problems is:

A. Edge Computing
B. Quantum Computing
C. Cashless Payment
D. Social Networking Services

3. Platforms that allow users to communicate, post, and share content quickly and are highly effective at spreading information are:

A. Social Networking Services (SNS)
B. E-commerce
C. Remote Work
D. Cloud Computing

4. A working style in which a person performs their tasks and duties from home or another remote location using communication technologies and the Internet is called:

A. Online Learning
B. Remote Work
C. Autonomous Driving
D. Edge Computing

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Unit One: Information Technology and Society

Lesson 1-2 How AI Works

First Period: ….	Week: …….	Date: …….

First: Performance Tasks

Essay Questions

1. Define Artificial Intelligence (AI), explaining the differences among Machine Learning, Deep Learning, and Generative AI in three points.

.....

2. Explain how models learn patterns in Machine Learning compared with traditional methods that rely on explicit programming of rules.

.....

Objective Questions (Multiple Choice)

1. Which of the following represents the broad field that includes computer systems capable of performing tasks such as learning, prediction, and speech and image recognition?

A. Deep Learning

B. Artificial Intelligence

C. Machine Learning

D. Generative AI

2. What is Machine Learning in the context of the hierarchy of AI technologies?

A. A branch of Artificial Intelligence in which models learn patterns from data.

B. A style that relies exclusively on unconnected neural networks.

C. A system for generating images and videos exclusively without training data.

D. A set of strictly programmed and fixed rules.

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Second: Homework

Essay Questions

1. What are the basic components of an Artificial Neural Network (ANN)?

.....

2. Explain the concept of Generative Artificial Intelligence (GenAI), giving examples.

.....

Objective Questions (Multiple Choice)

1. Which term describes a Machine Learning style that relies on multi-layer neural networks to learn complex representations and patterns?

A. Machine Learning

B. Generative AI

C. Deep Learning

D. Spam Filter

2. What is the primary function of Generative AI systems?

A. Programming explicit rules for old computers.

B. Creating new content such as text, images, audio, and software.

C. Classifying spam emails only without generating content.

D. Operating integrated circuits according to Moore's Law.

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Second Period	Week: …….	Date: …….

First: Performance Tasks

Essay Questions

1. Explain the relationship among Artificial Intelligence (AI), Machine Learning, Deep Learning, and Generative AI.

.....

2. Explain what the term “hallucination” means in the context of Generative AI.

.....

Objective Questions (Multiple Choice)

1. Which of the following technologies do most modern Generative AI systems rely on to create new content?

A. Explicitly programmed rules

B. Deep Learning models and neural networks

C. Edge Computing and Moore’s Law

D. Fixed classical bits

2. What does the term “hallucination” mean when Generative AI produces text?

A. Producing text that appears reasonable and logical but is factually incorrect.

B. Completely stopping the response due to an Internet connection failure.

C. Generating images that are 100% accurate and perfectly match reality.

D. Classifying spam emails with extremely high accuracy.

Second: Homework

Essay Questions

1. Suppose a farmer wants to use an AI system to distinguish between images of healthy crops and those affected by diseases. Explain what type of data the system needs for training, and identify one factor that could cause its prediction to be incorrect.

.....

2. Discuss one benefit and one risk of using Generative AI to write a school report. What should learners do to verify the generated output?

.....

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Objective Questions (Multiple Choice)

1. Which of the following is NOT an appropriate example of a Generative AI application?

A. ChatGPT for generating text
B. AI tools for generating images
C. A spam filter
D. Tools for generating audio and sound clips

2. What are the basic components of an Artificial Neural Network (ANN) that enable it to learn complex patterns from data?

A. Connected layers containing neurons whose weights change during training
B. A set of vacuum tubes and simple electrical circuits
C. Fixed programming rules written using purely linear algorithms
D. Manual switches for controlling the flow of electric current in the processor

Third Period	Weekly Assessment	Week: …….	Date: …….

Model (A)

Essay Questions

1. Define Artificial Intelligence and explain how intelligent systems today differ from traditional computers programmed with fixed rules.

.....

2. Explain in detail the relationship among Artificial Intelligence, Machine Learning, and Deep Learning, supporting your answer with the basic concepts of each.

.....

3. What is Generative Artificial Intelligence, and how does it rely on Deep Learning models to create new content such as text and images?

.....

4. Discuss the problem of hallucination in Generative AI, explaining why it is dangerous and what should be done to verify the outputs.

.....

Objective Questions (Multiple Choice)

1. Which of the following is a branch of Artificial Intelligence in which models learn patterns from data to make predictions or classifications without explicitly programming every rule?

A. Deep Learning
B. Generative Artificial Intelligence
C. Machine Learning
D. Cloud Computing

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2. A Machine learning style that relies on multi-layer neural networks to learn complex representations and patterns, such as image analysis and speech recognition, is:

A. Deep Learning
B. Artificial Intelligence
C. Generative Artificial Intelligence
D. Traditional Programming

3. A computer system inspired, in a simplified way, by the idea of interconnected neurons, whose weights change during training, is:

A. Qubit
B. Artificial Neural Network
C. Classical Bit
D. Moore's Law

4. When Generative AI produces text that appears reasonable but is factually incorrect, this phenomenon is called:

A. Hallucination
B. Quantum Superposition
C. Edge Computing
D. Linear Processing

Model B

Essay Questions

1. Explain how everyday examples, such as spam classification, product recommendations, and translation, help us understand applications of Artificial Intelligence.

.....

2. Clearly compare Machine Learning with Deep Learning in terms of their use of neural networks and the amount of data required for training.

.....

3. Explain how Generative AI can create new and diverse content, such as text, images, and audio, based on training data.

.....

4. State an appropriate rule for using Generative AI in school assignments, and give two convincing reasons why it is necessary to verify the accuracy of sources.

.....

Objective Questions (Multiple Choice)

1. Which of the following is a direct example of a Machine Learning application?

A. Spam filters and product recommendations
B. Generating complex artistic images and videos
C. Processing data on edge devices in vehicles
D. Operating integrated circuits according to Moore's Law

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2. What is the accurate description of Generative Artificial Intelligence (GenAI)?

A. A system limited to classifying spam emails and removing viruses.

B. Artificial Intelligence that uses Deep Learning to generate new data such as text and images.

C. A computing technology that uses quantum mechanics and parallel processing.

D. A simple neural network with only one input layer and one output layer.

3. What are the layers between the input layer and the output layer in an Artificial Neural Network called?

A. Hidden layers.

B. Edge layers.

C. Cloud layers.

D. Linear layers.

4. What should learners do to avoid the risks of hallucination when using Generative AI to prepare their school reports?

A. Rely completely on the outputs without any human review.

B. Verify the outputs and their sources and compare them with reliable facts.

C. Completely and permanently avoid using phones and computers.

D. Copy the generated texts exactly and submit them directly to the teacher.

Model C

Essay Questions

1. Why are most current Artificial Intelligence systems considered Narrow AI?

.....

2. Define an Artificial Neural Network.

.....

3. Draw a simple diagram showing the relationship among Artificial Intelligence, Machine Learning, Deep Learning, and Generative AI.

.....

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Objective Questions (Multiple Choice)

1. Most current Artificial Intelligence systems are designed to perform:

A. A specific task or a limited set of tasks (Narrow AI)

B. Fully simulate human consciousness in all fields without limitations

C. Manually program old household electrical devices

D. Manage global military communication networks only

2. Which of the following technologies is most suitable for complex image analysis and advanced speech recognition?

A. Deep Learning based on multi-layer neural networks

B. Manually programmed rules using fixed linear methods

C. Traditional Cloud Computing without Artificial Intelligence

D. E-commerce and Cashless Payment

3. What is the main benefit of the speed provided by Generative AI to students when preparing reports?

A. Helping complete tasks quickly while requiring attention to the risk of inaccurate information

B. Automatically guaranteeing that all information is 100% accurate

C. Completely eliminating the need for books and official school sources

D. Completely preventing hallucination

4. What is the appropriate procedure to follow when using Generative AI tools for assignments and projects?

A. Always verify the accuracy of the information and review the original sources and references

B. Consider everything produced by AI tools to be absolute scientific facts that cannot be questioned

C. Avoid writing any school research and rely entirely on Artificial Intelligence

D. Submit AI-generated outputs without reading or reviewing them

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Unit One: Information Technology and Society

Lesson 1-3 AI in Daily Life and Industry

First Period: ….	Week: …….	Date: …….

First: Performance Tasks

Essay Questions

1. Explain how technologies such as video platforms and voice assistants have become part of everyday services, and what the main role of Artificial Intelligence is in these services.

.....

2. Explain what is meant by “AI-based image diagnosis” in healthcare and how it contributes to detecting diseases.

.....

Objective Questions (Multiple Choice)

1. Which of the following is an example of a system that predicts preferences based on past behavioral data and provides recommendations?

A. Recommendation System
B. Voice Assistant
C. Machine Translation
D. Facial Recognition

2. Which service automatically translates text into different languages as part of everyday Artificial Intelligence services?

A. Recommendation System
B. Voice Assistant
C. Machine Translation
D. Facial Recognition

Second: Homework

Essay Questions

1. Mention four basic Artificial Intelligence services used in everyday life and state the role of Artificial Intelligence in each service.

.....

2. What role does Artificial Intelligence play in the manufacturing sector? Mention two examples to illustrate your answer.

.....

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Objective Questions (Multiple Choice)

1. Which term refers to an Artificial Intelligence system that recognizes speech, understands commands, and carries them out, such as (Siri) and Google Assistant?

A. Recommendation System
B. Voice Assistant
C. Machine Translation
D. Facial Recognition

2. Which of the following industrial sectors is associated with the task of Optimization of delivery routes?

A. Healthcare
B. Agriculture
C. Manufacturing
D. Logistics

Second Period:	Week:	Date: .....

First: Performance Tasks

Essay Questions

1. Explain how Artificial Intelligence is used in the agricultural sector and its role in monitoring crops and pests.

.....

2. Mention four tasks that Artificial Intelligence can perform in processing complex data and recognizing images and speech.

.....

Objective Questions (Multiple Choice)

1. Which industry uses Artificial Intelligence to detect diseases from X-ray and CT scan images?

A. Healthcare
B. Agriculture
C. Manufacturing
D. Logistics

2. Which of the following represents the main task of Artificial Intelligence in the agricultural sector?

A. Optimization of delivery routes
B. Predicting harvest time and detecting pests and diseases
C. Product quality inspection and predictive maintenance
D. Analyzing medical images and discovering drugs

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Second: Homework

Essay Questions

1. Explain the statement: “Artificial Intelligence is good at finding patterns in data, but human judgment is still necessary.”

.....

2. Mention three precautions for using Artificial Intelligence.

.....

Objective Questions (Multiple Choice)

1. What is the term used to describe the generation of incorrect or unsupported information by Artificial Intelligence that appears convincing?

A. Black- Box Problem

B. Hallucination

C. Discrimination or Bias

D. Insufficient Training Data

2. What is meant by the “Black- Box Problem” in the context of Artificial Intelligence applications?

A. Generating incorrect information that appears convincing to the user

B. Lack of clarity about how an AI reached its judgment

C. Using copyrighted works as training data

D. Insufficient training data or training data that does not accurately represent reality

Third Period	Weekly Assessment	Week:	Date: .....

Model (A)

Essay Questions

1. Explain how recommendation systems are used in daily life, giving practical examples such as YouTube and Amazon.

.....

2. Mention the uses of Artificial Intelligence in healthcare.

.....

3. Mention four major industrial sectors in which Artificial Intelligence technologies are used, briefly explaining the role of AI in each sector.

.....

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4. Explain what Artificial Intelligence excels at and what requires caution when using it, particularly with regard to ethical decisions and privacy.

.....

Objective Questions (Multiple Choice)

1. Which of the following services is used to unlock a smartphone as well as detect and recognize faces in photos?

A. Recommendation System
B. Voice Assistant
C. Machine Translation
D. Facial Recognition

2. What technology is used to inspect product quality and predict machine failures before they occur?

A. Artificial Intelligence for Image-Based Diagnosis
B. AI for image-based diagnosis; AI in manufacturing and predictive maintenance.
C. Recommendation System and Voice Assistant
D. Machine Translation and Social Networks

3. Among the precautions for using artificial intelligence: What does "hallucination" mean?

A. Not knowing how the system arrived at its decision
B. Generating incorrect or unsupported information that appears convincing.
C. Presence of bias in the data
D. Violation of copyright in data

4. Which of the following is the correct description of what artificial intelligence excels at?

A. Identifying and classifying patterns in complex data and probabilistic inference.
B. Making absolute ethical judgments without human involvement.
C. Ensuring outputs are completely free from any future bias.
D. Preserving and protecting personal data with complete confidentiality.

Model (B)

Essay Questions

1. Describe the role of artificial intelligence in voice assistants, providing two examples.

.....

2. Discuss the role of artificial intelligence in the agriculture and logistics sectors regarding the improvement of operations and productivity.

.....

3. Briefly explain the usage considerations associated with biased training data, high-impact decisions, and the determination of accountability.

.....

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4. Explain why confirmation from a human physician is necessary for a medical diagnosis, rather than relying solely on artificial intelligence.

.....

Objective Questions (Multiple Choice)

1. A daily service used to understand speech and execute voice commands, such as (Siri) and Google Assistant?

A. Recommendation System
B. Voice Assistant
C. Machine Translation
D. Facial Recognition

2. An industrial sector using artificial intelligence to optimize delivery routes

A. Healthcare
B. Agriculture
C. Manufacturing
D. Logistics

3. What is the term used to describe the lack of clarity regarding how artificial intelligence arrives at a judgment or decision?

A. Healthcare
B. Black- Box Problem
C. Discrimination or Bias
D. Probabilistic inference

4. Among the tasks that artificial intelligence excels at?

A. Making complex ethical decisions.
B. Image, audio, and text recognition and content generation.
C. Ensuring absolute result accuracy without training data.
D. Automatically protecting personal data.

Model (C)

Essay Questions

1. Explain three services that artificial intelligence can provide in daily life.

.....

2. Mention two examples of artificial intelligence's contribution to the manufacturing sector.

.....

3. Explain the dimensions related to the "black box" problem and rights-related issues when using copyright-protected works as training data.

.....

4. Explain the fundamental differences between areas where artificial intelligence excels such as pattern recognition and aspects that require extreme caution, such as privacy and ethics.

.....

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Objective Questions (Multiple Choice)

1. A system that predicts preferences based on past behavior data and displays recommendations on platforms such as YouTube and Amazon is called.

A. Recommendation System
B. Voice Assistant
C. Machine Translation
D. Facial Recognition

2. Which of the following industries uses artificial intelligence to predict harvest times and detect pests and diseases?

A. Healthcare
B. Agriculture
C. Manufacturing
D. Logistics

3. Issues with an ethical dimension that may lead to discrimination or bias fall within the scope of.

A. What Artificial Intelligence Excels At.
B. Caution is required when using artificial intelligence.
C. Core Skills for Deep Learning
D. The Role of dialy Recommendation Systems

4. Bias in artificial intelligence systems is defined as

A. A pattern that could lead to unfair results.
B. Hallucination
C. Quantum superposition.
D. Probabilistic inference.

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Unit One: Information Technology and Society

Lesson 1-4 Ethical issues with AI

First Period	Week: …….	Date: …….

First: Performance Tasks

Essay Questions

1. What is meant by the term "algorithmic bias" in artificial intelligence systems, and what are its most prominent forms or examples?

……

2. Explain the main reasons behind the emergence of algorithmic bias in artificial intelligence systems.

……

Objective Questions (Multiple Choice)

1. Which of the following options is an inappropriate or incorrect reason for the emergence of algorithmic bias?

A. Biased training data
B. Reflection of prior discriminatory biases in the data
C. The computer's processing speed is slow.
D. Insufficient data on certain characteristics

2. What does the term "algorithmic bias" represent in artificial intelligence systems?

A. Biases in AI outputs can lead to unfair or harmful results.
B. A technology that enables humans to understand why artificial intelligence has reached a specific decision.
C. Proper handling and protection of personal data
D. Identifying the entities responsible for the system, its decisions, and its effects.

Second: Homework

Essay Questions

1. Explain how the development of artificial intelligence technology has led to the emergence of new issues regarding privacy and surveillance in public spaces.

……

2. What is meant by the term "training data" in artificial intelligence systems, and how does its lack of representation affect the outputs?

……

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Objective Questions (Multiple Choice)

1. Which of the following options represents the precise concept of "training data"?

A. The examples from which an AI system learns its patterns prior to use.
B. A technique that enables humans to understand the reason behind a specific judgment made by the AI.
C. Identifying the parties responsible for the system, its decisions, and its impacts
D. Avoiding unfair discrimination against any individual or group

2. What is one of the privacy issues associated with artificial intelligence?

A. Improving AI computing speed
B. Creating AI for creative work
C. Identifying and tracking individuals using facial recognition technology.
D. Increasing microprocessor efficiency

Second Period:	Week: …….	Date: …….

First: Performance Tasks

Essay Questions

1. What is meant by the term "Explainable AI" (XAI), and why is it considered a method for overcoming the "black box" problem?

.....

2. Compare briefly the concepts of responsibility and accountability in the context of artificial intelligence systems?

.....

Objective Questions (Multiple Choice)

1. What is the term that describes the technology enabling humans to understand the factors and reasons that led an artificial intelligence to make a specific decision?

A. Cloud Computing.
B. Explainable artificial intelligence (XAI).
C. edge computing
D. algorithmic bias

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2. What is the fundamental difference between responsibility and accountability, as explained in the lesson?

A. Responsibility entails demonstrating the decision-making process, whereas accountability entails prompt handling.
B. Responsibility relates to defining the roles and duties of the parties, whereas accountability entails identifying the entities that can be held answerable based on their roles.
C. Accountability is the technique of understanding the logic of artificial intelligence, whereas responsibility is the collection of data.
D. There is no difference between them; they are synonymous terms.

Second: Homework

Essay Questions

1. List the four fundamental principles of AI ethics and briefly explain the principle of "fairness".

.....

2. Explain the meaning of the principles of “transparency” and “privacy protection” within the framework of the responsible use of artificial intelligence.

.....

Objective Questions (Multiple Choice)

1. Among the fundamental principles of AI ethics, which principle requires avoiding unfair discrimination against any specific individual or group?

A. Transparency
B. Accountability
C. Fairness
D. Privacy Protection

2. What is the principle that refers to providing clear and appropriate information about the system, its use, the decision-making process, and its limitations?

A. Fairness
B. Transparency
C. Privacy Protection
D. Accountability

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Third Period | Weekly Assessment | Week: ……. | Date: …….

Model (A)

Essay Questions

1. Explain the concept of "algorithmic bias" in artificial intelligence systems, detailing how it arises from training data, system design, its method of use, including examples.

……

2. Discuss in detail Explainable AI (XAI) and the "black box" problem, and how it contributes to system evaluation and error detection.

……..

3. Compare precisely the concepts of "responsibility" and "accountability," explaining why the distribution of responsibility varies depending on the context and the parties involved (developer, operator, and user).

……

4. List the four fundamental principles of AI ethics and briefly explain what is meant by "fairness," "transparency," "privacy protection," and "accountability."

……

Objective Questions (Multiple Choice)

1. A pattern in the outputs of Artificial Intelligence that leads to unfair or harmful results and arises from data or system design is called:

A. Explainable Artificial Intelligence (XAI)
B. Algorithmic Bias
C. Absolute Transparency
D. Privacy Protection

2. A technique that allows humans to understand the reason behind an AI system's decision, provides meaningful judgment, and helps avoid the Black Box problem is:

A. Explainable Artificial Intelligence (XAI)
B. edge computing
C. Training Data
D. Algorithmic Bias

3. The principle concerned with handling personal information appropriately and protecting it is:

A. Fairness
B. Transparency
C. Privacy Protection
D. Accountability

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4. Identifying the parties responsible for the system, its decisions, its impacts, and ensuring that they can be held accountable according to their roles represents the principle of:

A. Transparency
B. Fairness
C. Accountability
D. Privacy Protection

Model (B)

Essay Questions

1. Explain how unrepresentative or biased training data (such as data reflecting previous human biases) can cause an AI system to reproduce and reinforce such bias in its judgments.

.....

2. Explain the “Black Box” problem in complex Artificial Intelligence algorithms, and why it makes understanding how the system works and detecting errors difficult without using explainable techniques.

.....

3. Mention the privacy issues associated with the widespread use of facial recognition technologies in public places and the mass collection of data and online behavior.

.....

4. Explain in detail the four fundamental principles of AI ethics and how each of them guides the responsible use of these technologies in society.

.....

Objective Questions (Multiple Choice)

1. The examples from which an Artificial Intelligence system learns its patterns before being used, and which directly affect the quality of its outputs, are called:

A. Training Data
B. Operating Algorithms
C. Peripheral Devices
D. Random Memory

2. Providing clear and appropriate information about the system, its use, the decision-making process, and its limitations is an accurate definition of the principle of:

A. Fairness
B. Transparency
C. Accountability
D. Privacy Protection

3. Avoiding unfair discrimination against any individual or specific group in Artificial Intelligence judgments and outputs represents the principle of:

A. Fairness
B. Transparency
C. Privacy Protection
D. Accountability

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4. The method or technique that helps humans understand the factors that contributed to the system reaching a specific output or decision is:

A. Algorithmic Bias
B. Explainable Artificial Intelligence (XAI)
C. Mass Data Collection
D. Network Auditing

Model (C)

Essay Questions

1. Discuss the causes of algorithmic bias and how it may arise from an inappropriate choice of variables or from using an alternative variable that indirectly represents a protected characteristic.

.....

2. Explain the importance of Explainable Artificial Intelligence (XAI) in addressing the difficulty of understanding how a result is reached when the reasons are not clear to the human eye.

.....

3. Explain the different dimensions of responsibility among multiple parties (the developer, operating company, and user) when an Artificial Intelligence system makes an incorrect or unfair decision.

.....

4. Explain how the four principles of AI ethics (fairness, transparency, privacy protection, and accountability) complement one another to form an integrated framework for responsible use.

.....

Objective Questions (Multiple Choice)

1. Identifying the roles and duties of the parties involved in developing, operating, and using the system (developer, operator, and user) refers to the concept of:

A. Accountability
B. Algorithmic Bias
C. Training Data
D. Transparency

2. A system or technology that collects large amounts of online behavioral data and allows individuals to be tracked in public places may create concerns related to:

A. Algorithm Efficiency
B. Privacy Protection
C. Memory Efficiency
D. Moore's Law

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3. One of the following represents the precise definition of the principle of "accountability."

A. Providing clear information about the system and its limitations
B. Non-discrimination against any person or group
C. Understanding the factors that contributed to the system reaching a specific outcome.
D. Transparency

4. Which of the following options is a clear example of bias in artificial intelligence systems?

A. A hiring system that unfairly favors a particular group, or a facial recognition system with lower accuracy for certain groups.
B. A program for organizing personal folders and files on the local computer.
C. An application for calculating simple mathematical operations and geometric operations.
D. A tool for editing landscape photos and enhancing their lighting.

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Unit Two: Cyber security

Lesson 2-1 Cryptographic technologies and authentication

First Period **Week: .....** **Date: .../.../.....**

First: Performance Tasks:

Essay Questions:

1. Explain how HTTPS communications secure the connection, and what role does the TLS protocol play in this process?

.....

2. Distinguish between the roles of Symmetric cryptography and public-key cryptography during an HTTPS connection.

.....

Objective Questions (Multiple Choice):

1. **Which of the following technologies is primarily used to encrypt session data quickly and efficiently after the handshake and security agreement have been completed?**

A. Public-key cryptography
B. Symmetric cryptography
C. Digital signature
D. Digital certificate

2. What are the steps for establishing a secure connection and verifying the identity of the server and domain name through HTTPS called?

A. TLS handshake
B. Digital signature
C. Two-factor authentication
D. Symmetric cryptography

Second: Homework

Essay Questions:

1. What is meant by the term “Two-Factor Authentication (2FA),” and how does using a second independent factor reduce the risk of unauthorized access?

.....

2. State the main differences between Two-Factor Authentication (2FA) and Multi-Factor Authentication (MFA) in terms of the number and categories of factors used.

.....

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Objective Questions (Multiple Choice):

1. Which of the following options represents two factors from two completely different categories (knowledge and possession) used in two-factor authentication for banking services?

A. Password + a second text password
B. Password + One-Time Password (OTP)
C. Fingerprint + facial recognition
D. Paper ID card + username only

2. What is meant by the term Multi-Factor Authentication (MFA)?

A. Using one very strong and highly complex password.
B. Using two or more factors from different categories, such as knowledge, possession, and biometrics.
C. Relying exclusively on a fingerprint for login.
D. Using an email address together with a traditional password.

Second Period **Week: .....** **Date:……/.../.....**

First: Performance Tasks:

Essay Questions:

1. What is the primary role of a digital certificate and public-key mechanisms when establishing a secure TLS connection?

.....

2. Briefly compare the function of a digital signature with the function of a digital certificate in security systems.

.....

Objective Questions (Multiple Choice):

1. Which technology helps the browser verify the identity of the server and the certificate's association with the domain name it is connecting to?

A. Symmetric cryptography
B. Digital signature
C. Digital certificate
D. Two-factor authentication

2. Which of the following technologies detects tampering and impersonation and provides evidence supporting non-repudiation?

A. Symmetric cryptography
B. Digital signature
C. TLS handshake
D. Two-factor authentication

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Second: Homework

Essay Questions:

1. Briefly explain how different security technologies (cryptography, certificates, and two-factor authentication) are combined when completing a purchase through an online store.

.....

2. Why is relying on only one security technology not enough to protect online services and communications, and what is the practical benefit of using multiple layers of security?

.....

Objective Questions (Multiple Choice):

1. Which of the following technologies prevents third parties from reading the content of communication while data is being transmitted over the network?

A. Encryption (using symmetric-key and public-key encryption)
B. Digital signature
C. Two-factor authentication (2FA)
D. Digital certificate

2. Which of the following is an incorrect example of two-factor authentication because it relies on the same category of factor (knowledge)?

A. Password + a one-time password (OTP) sent to the phone
B. Password + fingerprint
C. Password + a second secret password
D. Password + code from an authentication app

Third Period	Weekly Assessment	Week:	Date: .....

Model (A)

Essay Questions

1. A detailed explanation of how HTTPS connections utilize various techniques to secure the connection, from the initial handshake to the data exchange.

.....

2. Clearly distinguish between the roles of symmetric encryption and public-key encryption, explaining the reason each is used during the stages of an HTTPS connection.

.....

3. Illustrate with a practical example how to use two-factor authentication when logging into social media accounts or banking services.

.....

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4. Discuss the following statement: "Secure online communication and services rely on a combination of encryption and authentication, rather than a single technology," explaining the role of each technology within this combination.

.....

Objective Questions (Multiple Choice):

1. The HTTP protocol transmitted over a secure TLS connection, providing data confidentiality and integrity during transit, is known as:

A. HTTPS B. FTP
C. SMTP D. DNS

2. Using two independent factors from different categories to verify identity is known as:

A. Symmetric cryptography B. Two-factor authentication
C. Digital signature D. Digital certificate

3. A technology that detects tampering and impersonation, and provides evidence supporting non-repudiation, is:

A. Digital signature B. public-key cryptography
C. TLS handshake D. cloud computing

4. Which of the following options accurately represents the categories of multi-factor authentication (MFA) factors?

A. Knowledge, possession, and biometric traits.
B. Speed, efficiency, and cost.
C. Public key, private key, and password.
D. Wireless connectivity, local area network, and the cloud.

Model (B)

Essay Questions

1. Explain the main steps that occur during the "TLS handshake" and how the browser verifies the server's certificate.

.....

2. Illustrate why using public-key encryption for all exchanged data is slow, and how the TLS protocol addresses this issue using session keys.

.....

3. Compare the different categories of authentication factors (knowledge, possession, and Biometric traits), providing an example for each category.

.....

4. Explain how using a second, independent factor (such as an authentication app or an SMS code) prevents account compromise, even if the primary password is leaked.

.....

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Objective Questions (Multiple Choice):

1. A pair of linked keys consisting of a public key and a private key used in encryption to secure communication is:

A. A. Public-key encryption B. Symmetric cryptography
C. Quantum Qubit D. Classical Bit

2. A service or system that helps the browser verify the server's identity and the match between the domain name and the digital certificate:

A. Digital signature B. Digital certificate
C. Symmetric cryptography D. Two-factor authentication

3. Which of the following options is a valid example of the "possession" factor in two-factor authentication?

A. knowing secret question B. one-time password (OTP) sent to the phone or smart card

C. user fingerprint D. facial recognition

4. Security technology configurations in online stores ensure the protection of registration and payment processes through:

A. Relying on a single technology for rapid implementation.
B. combining encryption, certificates, signatures, and two-factor authentication to mitigate multiple risks.
C. completely eliminating the use of passkeys
D. relying solely on symmetric encryption without any authentication.

Model (C)

Essay Questions

1. Explain in detail how digital certificates and the chain of trust enable the browser to verify the validity and suitability of the server's hostname.

.....

2. Briefly discuss the digital signature, outlining its characteristics and explaining how it helps detect tampering and impersonation, as well as providing proof of non-repudiation.

.....

3. What are the security benefits of combining multiple security technologies such as encryption, digital signatures, certificates, and two-factor authentication in the context of banking services and online shopping?

.....

4. Feel free to discuss why advanced security measures such as TLS and two-factor authentication do not guarantee absolute protection or ensure that a website's content is entirely trustworthy.

.....

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Objective Questions (Multiple Choice):

1. The steps for establishing a secure connection and agreeing on shared secrets from which session keys are derived are called:

A. TLS handshake
B. Symmetric cryptography
C. Digital signature
D. Digital certificate

2. Using two or more factors from different categories to verify identity (such as knowledge, possession, and biometric traits) is called:

A. multi-factor authentication (MFA)
B. A. Public-key encryption
C. TLS handshake
D. Symmetric cryptography

3. Which of the following is an example of the "Biometric traits" factor in the authentication?

A. text password
B. fingerprint or facial recognition
C. ATM card
D. SMS verification code

4. Secure online communication and services depend primarily on:

A. A single, unique, and definitive technology.
B. combining cryptography, authentication, certificates, and digital signatures.
C. sing only simple passwords.
D. eliminating the use of public and private keys.

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Unit Two: Cybersecurity

Lesson 2-2 Network Security Design

First Period **Week: .....** **Date: .../.../.....**

First: Performance Tasks:

Essay Questions:

1. Explain what is meant by the concept of “defense in depth” in network security, and why providing multiple layers of protection is more secure than relying on a single security measure.

.....

2. Explain the primary role of a (firewall) in network security, and give an example of how it controls network traffic.

.....

Objective Questions (Multiple Choice)

1. Which of the following is the most accurate definition of “defense in depth” in network security?

A. Relying entirely on a strong firewall at the network boundary.
B. Using multiple layers of security controls so that other layers reduce the risk if one layer fails.
C. Automatically trusting all devices within the organization’s geographical area.
D. Encrypting all traffic exclusively when using public Wi-Fi networks.

2. What is the term used for a system or program that monitors network traffic and allows or blocks it according to specific security rules?

A. Virtual Private Network (VPN)
B. Demilitarized Zone (DMZ)
C. Firewall
D. Zero Trust Approach

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Second: Homework

Essay Questions:

1. What is meant by the term “Virtual Private Network (VPN)”? Mention two of its main uses.

.....

2. Why is placing a public web server in a “Demilitarized Zone (DMZ)” more secure than placing it directly inside an organization’s internal network?

.....

Objective Questions (Multiple Choice)

1. What is the term that refers to a private connection or logical private network created over a public network such as the Internet and using encryption to protect data?

A. Firewall
B. Virtual Private Network (VPN)
C. Demilitarized Zone (DMZ)
D. Zero Trust Approach

2. Which of the following represents the most appropriate and common use of a Virtual Private Network (VPN) in modern work environments?

A. Securely connecting to the organization’s network from home or while traveling and working remotely.
B. Protecting endpoint devices from viruses and automatically removing them without additional software.
C. Monitoring local network traffic and blocking spam email.
D. Providing platforms that allow users to publish and share content at very high speeds.

Second Period **Week: .....** **Date: .../.../.....**

First: Performance Tasks:

Essay Questions:

Explain what is meant by a “Demilitarized Zone (DMZ)” in network designs, and how it protects internal infrastructure components.

.....

Briefly compare traditional security and the “Zero Trust Approach” in terms of how they treat users within the internal network.

.....

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Objective Questions (Multiple Choice)

1. What is meant by the term "Demilitarized Zone (DMZ)" in a network security architecture?

A. A fully open public network that allows attackers to access sensitive databases.
B. A zone where servers exposed to the external network are placed separately from the organization's internal network.
C. Malicious software that monitors network traffic and automatically modifies firewall rules.
D. An encrypted virtual private link that connects different branches over the public Internet.

2. What is the fundamental assumption of the "Zero Trust Approach" when securing an organization's resources?

A. Automatically considering every device or user inside the organization's network to be completely trusted.
B. Not automatically trusting a user or device simply because it is inside the network or owned by the organization, and verifying identity and context.
C. Relying entirely on the external security perimeter without inspecting internal applications.
D. Encrypting email messages only without considering data access permissions.

Second: Homework

Essay Questions

1. Explain how security assumptions about the traditional "security perimeter" have changed with the widespread adoption of cloud computing and remote work.

.....

2. Give examples of the four security measures associated with the layers of defense in depth (network entry point, communication path, server placement, and endpoints).

.....

Objective Questions (Multiple Choice)

1. What concept describes the traditional boundary that assumes everything inside an organization's network is completely secure and everything outside it is unsafe, a boundary that has been blurred by cloud services and remote work?

A. Demilitarized Zone (DMZ)
B. Security Perimeter
C. Edge Computing
D. Quantum Superposition

2. Which of the following "defense in depth" layers is directly associated with installing antivirus software and updating the operating system?

A. Network Entry Point
B. Communication Path
C. Server Placement
D. Peripheral devices

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Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions

1. Explain in detail how “defense in depth” provides better protection for an organization than relying on a single security measure, referring to what happens when one of the defenses is breached.

.....

2. Explain the technical role of a “firewall” in monitoring network traffic, and give an example of how it protects databases.

.....

3. Explain the concept of a “Virtual Private Network (VPN)” in detail and how it protects data transmitted over public Wi-Fi networks from eavesdropping.

.....

4. Compare traditional security and the “Zero Trust Approach” in detail, explaining why traditional designs alone are currently ineffective.

.....

Objective Questions (Multiple Choice)

1. Which of the following devices or systems monitors network traffic and allows or blocks it according to specific security rules?

A. Firewall
B. Demilitarized Zone (DMZ)
C. Virtual Private Network (VPN)
D. Edge Computing

2. What is the zone in which public-facing servers are isolated from the internal network to reduce the impact of attacks called?

A. Security Perimeter
B. Demilitarized Zone (DMZ)
C. Communication Path
D. Peripheral devices

3. What is the term for a security approach that does not automatically trust a user or device simply because it is inside the network?

A. Defense in Depth
B. Firewall
C. Zero Trust Approach
D. Virtual Private Network (VPN)

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4. Which of the following represents the main use of a Virtual Private Network (VPN) for connecting offices or employees?

A. Encrypting communication and protecting data over untrusted networks or when working remotely.
B. Automatically removing viruses from the hard drive.
C. Speeding up public Internet connections without the need for passwords.
D. Providing a graphical interface for managing large databases.

Model (B)

Essay Questions

1. Explain how a "Demilitarized Zone (DMZ)" protects an organization's internal network when one of its public web servers is compromised by an external attack.

.....

2. Discuss the four layers of "defense in depth," identifying the security measure associated with each layer, from the network entry point to the endpoints.

.....

3. Explain how applying the "Zero Trust Approach" contributes to verifying every access request based on identity, permissions, and context.

.....

4. Discuss why the effectiveness of the traditional "security perimeter" has declined in modern work environments that rely on cloud computing and remote work.

.....

Objective Questions (Multiple Choice)

1. The technology that creates a private, encrypted virtual tunnel over the Internet for secure communication from a remote location is:

A. Firewall
B. Virtual Private Network (VPN)
C. Demilitarized Zone (DMZ)
D. Zero Trust Approach

2. The "defense in depth" layer that focuses on installing antivirus software and keeping the operating system up to date is:

A. Network Entry Point
B. Communication Path
C. Server Placement
D. Peripheral devices

3. The traditional boundary that assumes that everything inside an organization's network is completely secure and everything outside it is a threat is known as:

A. Security Perimeter
B. Demilitarized Zone (DMZ)
C. Quantum Superposition
D. Edge Computing

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A system or program that monitors network traffic and allows or blocks it according to specific security rules is:

A. Firewall
B. Virtual Private Network (VPN)
C. Qubit
D. Edge Computing

Model (C)

Essay Questions

1. Discuss the security importance of using a "Virtual Private Network (VPN)" when connecting to untrusted networks and how it protects the content of the communication from eavesdropping.

.....

2. Explain how a firewall, a Virtual Private Network (VPN), a Demilitarized Zone (DMZ), and endpoint control work together to form an integrated "defense in depth" strategy.

.....

3. Explain how the "Zero Trust Approach" handles identity, context, and permissions compared with traditional security, which trusts everything inside the perimeter.

.....

4. Explain why placing an email server or web server in a "Demilitarized Zone (DMZ)" is a fundamental protective measure for the security of sensitive internal databases.

.....

Objective Questions (Multiple Choice)

1. The zone where servers exposed to the external network are placed separately from the internal network is called:

A. Firewall
B. Demilitarized Zone (DMZ)
C. Virtual Private Network (VPN)
D. Peripheral devices

2. A security approach that does not automatically trust a user or device simply because it is inside the network or owned by the organization is:

A. Defense in Depth
B. Zero Trust Approach
C. Security Perimeter
D. Firewall

3. Which of the following represents the first layer (Network Entry Point) in a defense in depth strategy?

A. Encrypting communication using a Virtual Private Network (VPN).
B. Preventing unauthorized connections using a firewall.
C. Separating public-facing servers using a Demilitarized Zone (DMZ).
D. Installing antivirus software on Peripheral devices.

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4. A private connection or logical private network over a public network such as the Internet, using encryption and tunneling technologies to protect data, is:

A. Virtual Private Network (VPN)
B. Demilitarized Zone (DMZ)
C. Firewall
D. Zero Trust Approach

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Unit Two: Cybersecurity

Lesson 2-3 "Incident Response and Risk Management"

First Period **Week: .....** **Date: .../.../.....**

First: Performance Tasks:

Essay Questions:

1. What is meant by the term "security incident," and what are the main typical examples of it?

.....

2. Explain the six stages of incident response, indicating the main purpose of the "Preparation" and "Detection" stages.

.....

Objective Questions (Multiple Choice):

1. Which of the following is a typical example of a security incident that affects service availability?

A. Leakage of personal or confidential information to external parties.
B. Unauthorized modification of data within a system.
C. Service disruption caused by attacks on a server.
D. Establishing response procedures and structures in advance.

2. What is the first stage of the incident response model that aims to establish response procedures and structures in advance in preparation for incidents?

A. Detection.
B. Preparation.
C. Containment.
D. Recovery.

Second: Homework

Essay Questions:

1. Explain the purpose of the "Containment" and "Eradication" stages in the incident response model.

.....

2. How is the level of risk estimated in the simplified model presented in the lesson? State its formula and the two main factors that make it up.

.....

Objective Questions (Multiple Choice):

1. What term refers to the process of isolating the affected part or appropriately limiting its impact to prevent the problem from spreading?

A. Preparation. B. Detection.
C. Containment. D. Recovery.

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2. How is the level of risk calculated in the simplified matrix?

A. Impact + Likelihood.
B. Impact × Likelihood.
C. Impact − Likelihood.
D. Impact ÷ Likelihood.

Second Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks:

Essay Questions:

1. Explain what is meant by the “Recovery” and “Lessons Learned and Improvement” stages in the incident response model.

.....

2. Why should the “Containment” stage be carried out before the “Eradication” stage? What might happen if this order is reversed?

.....

Objective Questions (Multiple Choice):

1. Which stage involves restoring systems and services to a safe and normal operating state and may include restoring them from a clean backup?

A. Preparation.
B. Containment.
C. Recovery
D. Lessons Learned and Improvement.

2. Which stage concludes the six stages of incident response and involves analyzing what happened and documenting lessons to improve controls?

A. Detection.
B. Eradication.
C. Recovery.
D. Lessons Learned and Improvement.

Second: Homework:

Essay Questions:

1. Explain how risks are handled according to the “Risk Assessment Matrix,” and which category represents the highest priority for treatment.

.....

2. Give examples of overlap or repetition that may occur between the incident response stages in real-world practice.

.....

Objective Questions (Multiple Choice):

1. According to the Risk Assessment Matrix, which category is considered the highest priority and should be addressed first?

A. Low impact and low likelihood.
B. Medium impact and medium likelihood.
C. High impact and high likelihood.
D. Low impact and high likelihood.

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2. What is meant by the term "Impact" in the context of risk assessment?

A. The likelihood of the event occurring.
B. The amount of harm if the risk occurs.
C. The speed of response to the security incident.
D. The number of times the incident has occurred.

Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions:

1. Define a "security incident" in detail and mention three typical examples, describing each one.

.....

2. List the six stages of incident response in sequential order, with a brief explanation of the "Preparation" and "Containment" stages.

.....

3. Explain how the "Risk Assessment Matrix" is used to determine treatment priorities based on impact and likelihood.

.....

4. Discuss why it is important to carry out the six incident response stages in order, and explain the nature of the potential overlap or repetition between them during actual incident handling.

.....

Objective Questions (Multiple Choice):

1. An event that affects the confidentiality, integrity, or availability of information, or violates a security policy, is called:

A. A security incident.
B. A risk assessment.
C. Threat containment.
D. A lesson learned.

2. The stage used to limit the spread of damage and isolate the affected part is called:

A. Preparation.
B. Containment.
C. Recovery.
D. Eradication.

3. The risks that represent the highest priority in the Risk Assessment Matrix are those with:

A. Low impact and rapid containment.
B. High impact and high likelihood.
C. Low impact and low likelihood.
D. Medium impact and zero likelihood.

4. What does the "Eradication" stage mean in the incident response model?

A. Establishing response procedures in advance.
B. Removing the threat and its causes, such as deleting malware.
C. Restoring systems from a backup.
D. Documenting lessons learned.

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Model (B)

Essay Questions:

1. Illustrate in detail the purpose of the “Detection” and “Eradication” stages within the six stages of incident response.

.....

2. Explain the meaning of “Impact” and “Likelihood” in the context of risk assessment and how they contribute to calculating the risk level.

.....

3. Discuss the importance of the “Lessons Learned and Improvement” stage and how it contributes to preventing the recurrence of security incidents in the future.

.....

4. Compare the three types of security incidents mentioned in the lesson (information leakage, data tampering, and service disruption) in terms of their descriptions.

.....

Objective Questions (Multiple Choice):

1. Unauthorized modification of data within a system is a typical example of:

A. Service disruption.
B. Information leakage.
C. Data tampering.
D. Advance preparation.

2. The stage concerned with restoring systems and services to a safe and normal operating state, including restoration from a backup, is:

A. Recovery.
B. Containment.
C. Detection.
D. Preparation.

3. The risk level in the simplified model is calculated as follows:

A. Impact ÷ Likelihood.
B. Impact + Likelihood.
C. Impact × Likelihood.
D. Impact − Likelihood.

4. What is meant by “Likelihood” in risk assessment?

A. The amount of expected harm if the event occurs.
B. The likelihood of the event or risk occurring.
C. The number of devices affected by the attack.
D. The speed of carrying out the response stages.

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Model (C)

Essay Questions:

1. Explain in detail how the “Recovery” and “Lessons Learned and Improvement” stages are carried out when handling a security incident such as a ransomware attack.

.....

2. Discuss the relationship between the “Containment” and “Eradication” stages and why containment should precede the removal of the cause.

.....

3. List the six stages of incident response in sequence, and explain how overlap or a return to previous stages may occur during actual incident response.

.....

4. Explain how organizations use the “Risk Assessment Matrix” to classify risks and direct efforts toward effective initial treatment.

.....

Objective Questions (Multiple Choice):

1. The leakage of personal or confidential information to external parties is a security incident involving:

A. Information leakage.
B. Service disruption.
C. Data tampering.
D. Secure recovery.

2. Analyzing what happened, documenting lessons learned, and improving controls to reduce the likelihood of recurrence are carried out during the:

A. Preparation stage.
B. Containment stage.
C. Eradication stage.
D. Lessons Learned and Improvement stage.

3. Risks with high impact and low likelihood in a Risk Assessment Matrix are usually classified as:

A. Very high risk.
B. Medium risk.
C. Very low risk.
D. No risk.

4. The stage that involves detecting and confirming the occurrence of a security incident after advance preparation is the:

A. Recovery.
B. Detection.
C. Lessons Learned.
D. Eradication.

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Unit 3: Web Applications

Lesson 3-1 The Overall Structure of Web Applications

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Define a web application.

.....

2. List the main the layers that a web application consists of.

.....

Objective Questions (Multiple Choice):

1. A web application is usually built from:

A. Three layers.
B. Two layers.
C. One layer.
D. Several layers.

2. The layer responsible for displaying screens and collecting user data and actions is:

A. Backend.
B. Database.
C. Frontend.
D. Processing server.

Second: Homework

Essay Questions:

1. Compare the role of the frontend and the backend in a social networking application.

.....

2. How does the backend handle the data received from the frontend and the data stored in the database in an E-commerce website?

.....

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Objective Questions (Multiple Choice):

1. In a video-sharing website, collecting the number of views and selecting recommended videos belongs to:

A. Frontend
B. Backend
C. Database
D. Communication network

2. Storing post data, follower relationships, and messages in a social networking service is the function of:

A. Processing server
B. Database
C. Frontend
D. Backend

Second Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Design a structural diagram showing how the three layers cooperate to perform user actions.

.....

2. Discuss the importance of the database tier in E-commerce websites.

.....

Objective Questions (Multiple Choice):

1. Sending payment requests and handling their results in an E-commerce website is a shared task of processing and control in:

A. Frontend
B. Database
C. Backend
D. User browser

2. The main role of the database layer in web applications is:

A. Receiving user actions
B. storing and retrieving data
C. Processing calculations
D. Displaying screens and interfaces

Second: Homework

Essay Questions:

1. Explain the overall structure of web applications and the three layers.

.....

2. Explain how the three tiers integrate to provide a video-sharing service, mentioning an example of a function for each layer.

.....

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Objective Questions (Multiple Choice):

1. In a video-sharing website, viewing history and user information are stored in:

A. Search screens
B. Backend
C. Frontend
D. Database layer

2. Controlling push notifications and determining the target audience for posts are performed through:

A. Backend
B. Frontend
C. Database
D. Timeline

Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Objective Questions:

1. Which of the following represents the role of the frontend in a web application?

A. Processing requests
B. Displaying content and receiving user input
C. Storing data
D. Verifying login information

2. When searching for a product in online store, which layer sends the request to the database?

A. Frontend
B. Backend
C. Database itself
D. Browser

3. Which of the following is an example of data stored in an e-commerce website's database?

A. Search screen
B. Order Log
C. Verify login
D. User interface

4. The main idea of the overall structure of web applications is:

A. The application is built from only one layer.
B. cooperation of three layers together: Frontend, Backend, and Database.
C. use the browser only.
D. Relying on the backend without the database.

Essay Questions:

1. Explain the difference between the frontend and backend in web applications, providing an example for each.

.....

2. Explain the role of the database in a web application and how it interacts with the backend to display results to the user.

.....

3. Trace the steps of a product search request in an online store across the three-layer architecture, and explain the role of each layer.

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4. Design an appropriate distribution of responsibilities for an e-commerce web application and justify your decisions.

.....

Model (B)

Objective Questions (Multiple Choice):

1. Which of the following is an example of a web application?

A. A video player program installed on a device
B. An online map website
C. A desktop calculator application
D. An image editing program

2. In a video-sharing website, which layer stores video and user data?

A. Frontend
B. Backend
C. Database
D. Browser

3. Which of the following represents a function of the backend in a web application?

A. Displaying product pages
B. displaying the search box to the user
C. Verifying login information
D. Storing order history

4. The main idea of the overall structure of web applications is:

A. The application is built from three layers that cooperate together.
B. Each layer works separately without cooperation.
C. The application works only through the browser.
D. The application depends only on the database.

Essay Questions:

1. Explain the concept of a web application, citing examples from your daily life.

.....

2. Discuss the importance of dividing a web application into main layers.

.....

3. Explain how the three layers collaborate when using a social networking site.

.....

4. Analyze the role of the back-end in an e-commerce website.

.....

Model (C)

Objective Questions (Multiple Choice):

1. The main idea of the overall structure of web applications is:

A. Each layer works separately without cooperation

B. The application depends only on the database.
C. The application works only through the browser.
D. The application is built from three layers that cooperate together.

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2. In a video-sharing website, which layer stores video and user data?

A. Frontend
B. Backend
C. Database
D. Browser

3. Which of the following is an example of a web application?

A. A video player program installed on a device
B. An online map website
C. A desktop calculator application
D. An image editing program

4. Which of the following represents a function of the backend in a web application?

A. Displaying product pages
B. Displaying the search box to the user
C. Storing order history
D. Verifying login information

Essay Questions:

1. What is the role of the frontend in a video website?

.....

2. What is the role of the database in a social networking service?

.....

3. Identify the cooperation steps when sending an email.

.....

4. What is the importance of having a strong backend layer in E-commerce?

.....

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Unit 3: Web Applications

Lesson 3-2 Web Application Communication Methods

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Explain the Client-Server Model.

.....

2. Design a diagram showing how communication occurs between the client and the server.

.....

Objective Questions (Multiple Choice):

1. The client in web applications is:

A. The server that processes requests.
B. The program or device that sends requests.
C. The database.
D. The communication protocol.

2. When sending login information, it is preferable to use:

A. GET
B. POST
C. 200
D. 404

Second: Homework

Essay Questions:

1. Why is HTTPS considered more secure than HTTP? Give an example.

.....

2. Explain the difference between GET and POST methods, giving an example of each.

.....

Objective Questions (Multiple Choice):

1. Status code 200 means:

A. Internal server error.
B. Successful request.
C. Resource not found.
D. Unauthorized request.

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2. Status code 404 indicates:

A. Successful request.
B. Internal server error.
C. Resource not found.
D. Secure connection.

Second Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Explain the meaning of status code 200 in HTTP.

.....

2. What does status code 404 mean? When does it appear?

.....

Objective Questions (Multiple Choice):

1. The main difference between HTTP and HTTPS is:

A. HTTPS uses TLS encryption.
B. HTTP is always faster.
C. HTTPS does not support POST.
D. HTTP uses JSON.

2. JSON format is used for:

A. Designing the user interface.
B. Exchanging structured data.
C. Encrypting communication.
D. Determining status codes.

Second: Homework

Essay Questions:

1. What is the role of status code 500 in communication between the client and server?

.....

2. What is an API? How does it help in web application development?

.....

Objective Questions (Multiple Choice):

1. The API is:

A. database.
B. A set of rules for inter-program communication.
C. Security protocol.
D. Data format.

2. When displaying data from the server, it is typically used:

A. POST.
B. GET.
C. 500.
D. HTTPS.

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Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Objective Questions (Multiple Choice):

1. Which of the following represents the role of the Client in a web application?

A. Processing requests on the server.
B. Sending requests to obtain data.
C. Storing data in the database.
D. Determining the target audience for posts.

2. Which of the following is usually used to request a resource or data from the server?

A. POST
B. GET
C. API
D. JSON

3. Which of the following is a common format for exchanging data between applications?

A. HTML
B. JSON
C. CSS
D. SQL

4. Status code 404 means:

A. Successful request.
B. Internal server error.
C. The requested resource does not exist.
D. The request was not sent.

Essay Questions:

1. Explain the Client-Server model.

.....

2. Why should HTTPS be used on a login page?

.....

3. What is the role of the Application Programming Interface (API) in web applications?

.....

4. Explain status code 200.

.....

.

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Model (B)

Objective Questions (Multiple Choice):

1. Which of the following status codes indicates a successful request?

A. 200 B. 404
C. 500 D. 302

2. Which of the following is usually used to send form data to the server?

A. GET B. POST
C. API D. JSON

3. Which interface allows applications to communicate and exchange data?

A. HTML B. API
C. CSS D. SQL

4. Choose an example of a data format used for exchanging information between applications.

A. XML B. JSON
C. PHP D. Java

Essay Questions:

1. Explain why the request-response model is essential in web applications, including a practical example.

.....

2. Distinguish between GET and POST methods, and he determined appropriate positions for each of them.

.....

3. Explain the importance of HTTPS protocol during transmission across the network.

.....

4. Design an appropriate communication method for a web application task, an Example of (registering a new user).

.....

Model (C)

Objective Questions (Multiple Choice):

1. Which of the following status codes indicates an internal server error?

A. 200 B. 404
C. 500 D. 302

2. One of these techniques typically involves requesting a web page or search results.

A. POST B. GET
C. API D. JSON

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3. Which text format is used to represent structured data using objects and arrays?

A. HTML
B. JSON
C. CSS
D. SQL

4. Which of the following is used to secure communication between the client and server and prevent eavesdropping?

A. HTTP
B. HTTPS
C. API
D. JSON

Essay Questions:

1. Explain how the server handles requests received from the client, and what happens if the request is incorrect or does not exist.

.....

2. Explain the role of Application Programming Interfaces (API) in connecting different applications.

.....

3. Explain how JSON format is used in data exchange, and why is it considered suitable for web applications?

.....

4. Suggest a scenario for a web application that requires using the POST method, and explain the reason for your choice.

.....

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Unit 3: Web Applications

Lesson 3-3 Fundamentals of Fronted Technology

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Explain the role of HTML, CSS, and JavaScript in building a web page.

.....

2. Why is semantic HTML important in building web pages?

.....

Objective Questions (Multiple Choice):

1. HTML is responsible for:

A. Visual appearance.
B. The basic structure of the page.
C. Interactive behavior.
D. Performance improvement.

2. Which of the following is NOT an HTML semantic element?

A. <header>
B. <e-mail>
C. <main>
D. <footer>

Second: Homework

Essay Questions:

1. Explain how responsive design improves user experience.

.....

2. Explain the benefit of using a framework in frontend development.

.....

Objective Questions (Multiple Choice):

1. CSS is used for:

A. Building the structure.
B. Adding interaction.
C. Styling the appearance.
D. Managing databases.

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2. JavaScript adds:

A. Headings and paragraphs.
B. Colors and fonts.
C. Interactive behavior.
D. Semantic elements.

Second Period	**Week: ……**	**Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Give an example of a semantic HTML element and write its function.

.....

2. Discuss how CSS contributes to improving the visual appearance of a page.

.....

Objective Questions (Multiple Choice):

1. The semantic HTML element <header> is used for:

A. Main content.
B. Navigation.
C. Page header.
D. Page footer.

2. Responsive design means:

A. Adjusting the layout according to different screen sizes.
B. Using JavaScript only.
C. Improving databases.
D. Hiding unimportant content.

Second: Homework

1. What is the difference between the React library and the Next.js framework?

.....

2. Why is the mobile-first approach important in responsive design?

.....

Objective Questions (Multiple Choice):

1. React is used for:

A. Building user interfaces with reusable components.
B. Managing databases.
C. Encrypting communication.
D. Performance improvement only.

2. The Next.js framework is built on:

A. Vue
B. React
C. HTML
D. CSS

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Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions:

1. Discuss the role of HTML in building a web page.

.....

2. Explain how CSS helps improve the appearance of a web page.

.....

3. What is responsive design?

.....

4. What is the benefit of using a framework?

.....

Objective Questions (Multiple Choice):

1. It is used to define the appearance and styling of a web page:

A. HTML
B. CSS
C. JavaScript
D. JSON

2. Which HTML element is used to define the main content section?

A. <header>
B. <footer>
C. <main>
D. <nav>

3. Responsive design means:

A. Making the page work only on computers.
B. Automatically adjusting the layout according to different screen sizes.
C. Using JavaScript to add interactivity.
D. Improving server speed.

4. Which of the following is a JavaScript library used for building user interfaces?

A. React
B. HTML
C. CSS
D. SQL

Model (B)

Essay Questions:

1. Explain how HTML, CSS, and JavaScript work together to create a complete web page.

.....

2. Provide an example of a semantic HTML element and explain its benefit in improving accessibility.

.....

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3. Explain the concept of mobile-first in responsive design, and why it is used?

.....

4. Mention two common web development libraries and frameworks, explaining their characteristics.

.....

Objective Questions (Multiple Choice):

1. Which technology is used to build the basic structure of a page?

A. CSS
B. HTML
C. JavaScript
D. SQL

2. The HTML element <nav> is used for:

A. Displaying the main content.
B. Navigation between parts of the website.
C. Displaying the main heading.
D. Displaying the footer.

3. The main advantage of responsive design is:

A. Improving server speed.
B. Adapting to different screen sizes.
C. Adding interactivity using JavaScript.
D. Improving search engines.

4. A framework built on React that provides routing and page rendering is:

A. Next.js
B. Vue
C. HTML
D. CSS

Model (C)

Essay Questions:

1. How does JavaScript add interactivity to a web page? Give a practical example.

.....

2. Mention the benefits of using semantic HTML for search engines.

.....

3. Explain how responsive design improves user experience on smartphones.

.....

4. Discuss the role of the Next.js framework in modern web application development.

.....

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Objective Questions (Multiple Choice):

1. Which technology is used to add interactive behavior to a page?

A. HTML
B. CSS
C. JavaScript
D. SQL

2. The HTML element <footer> is used for:

A. Displaying the main content.
B. Displaying the footer at the bottom of the page.
C. Displaying the main heading.
D. Navigation between parts of the website.

3. The term mobile-first in responsive design means:

A. Designing the page first for computers.
B. Designing the page first for small screens such as smartphones.
C. Using JavaScript to add interactivity.
D. Improving server speed.

4. Which of the following is a JavaScript framework that enables building applications progressively?

A. React
B. Vue
C. Next.js
D. HTML

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Unit 4: Web and Media Design

Lesson 4-1 Types and Characteristics of Media

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Compare television and radio in terms of the type of information they communicate and communication method.

……

2. Explain the main strengths and constraints of websites compared with traditional media.

……

Objective Questions (Multiple Choice):

1. Which medium conveys sound only, is generally one-way, and can be received anywhere?

A. Television
B. Radio
C. Newspaper
D. Website

2. Which of the following is a constraint of websites?

A. Their information cannot be updated at any time.
B. Two-way interaction with users is not possible.
C. A website normally requires an Internet connection.
D. They can display text only and cannot include multimedia.

Second: Homework

Essay Questions:

1. Identify the most suitable medium for reaching many people at once with video. Explain why it is suitable.

……

2. Explain why organizations often combine multiple media, such as directing viewers from a TV commercial to a website, rather than relying on one single medium.

……

Objective Questions (Multiple Choice):

1. Which medium is most suitable for sending campaign information directly to specific people?

A. Television
B. Website
C. Email or direct messaging
D. Radio

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2. What is meant by two-way interaction in digital media?

A. One-way interaction: from sender to receiver only, with no response.
B. Users can respond and participate through features such as forms and comments.
C. It is a printed medium and can be read without an Internet connection.
D. Appeals only to hearing and can be received while carrying out other tasks.

Second Period	**Week: ……**	**Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Compare a newspaper with a website in terms of the types of media available, interaction, and the ability to update information.

……..

2. Identify a suitable medium for spreading information widely and rapidly. Give one reason for your choice.

……

Objective Questions (Multiple Choice):

1. Which medium remains as a physical printed product and can be read without an Internet connection?

A. Television
B. Social media
C. Newspaper
D. Website

2. Which purpose is most suitable for SNS?

A. Presenting detailed, structured information across many pages and sections.
B. Accessing printed information without an Internet connection.
C. Spreading information rapidly through sharing and word of mouth.
D. Delivering information directly and individually to specific people.

Second: Homework

Essay Questions:

1. Explain how a website can combine diverse information and support two-way interaction.

……

2. State two of constraints of using a website as the main communication channel for a service organization targeting families with no home Internet access.

……..

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Objective Questions (Multiple Choice):

1. What distinguishes SNS from traditional media such as television and radio?

A. It is limited to one-way interaction.
B. It can spread information rapidly and users can post and share information.
C. It is a physical printed medium that does not require electricity.
D. It conveys sound only no Images, texts.

2. When selecting a suitable medium to transfer information, which factors should be considered?

A. Purpose, target audience, and available resources.
B. Printed media should always be preferred.
C. Internet-based media should always be avoided.
D. One medium should be used for every audience.

Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions:

1. Compare television and newspapers in terms of their characteristics, the type of information they convey, the medium they use, and their reliance on an Internet connection.

……..

2. Explain the five main strengths of websites.

……

3. Explain how television, a website, and SNS can be combined as complementary media. Give example for your answer.

……

4. Discuss three constraints of websites and explain how each may affect the user experience.

……..

Objective Questions (Multiple Choice):

1. Which medium combines video and sound and is generally one-way interaction to reach a large audience?

A. Newspaper
B. Television
C. Radio
D. Email

2. Which of the following is a strength of websites?

A. They are always one-way medium and do not allow comments.
B. All website functions require an Internet connection without exception.
C. Information can be updated at any time and users can interact with the site.
D. They cannot display images or video.

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3. Which medium most appropriately provides a large amount of detailed information structured into pages and sections?

A. Radio
B. Printed newspaper
C. Website
D. Direct text messages

4. Which medium allows users to post and share information rapidly?

A. Newspaper
B. Television
C. SNS
D. Radio

Model B

Essay Questions:

1. Explain the characteristics of radio, including the advantage of listening while traveling and the constraint of being a one-way medium.

……

2. Explain how websites can provide two-way interaction. Refer to appropriate tools or features.

……

3. State an appropriate purpose for each of the following: television, websites, email, and SNS.

……

4. Discuss the challenges organizations face when trying to reach an audience without home Internet access. Suggest suitable alternative media or solutions.

……

Objective Questions (Multiple Choice):

1. Which medium depends on sound only and can be used while carrying out other tasks, subject to coverage?

A. Television
B. Radio
C. Website
D. Newspaper

2. Which medium supports direct, individual delivery to specified people?

A. Television
B. SNS
C. Email or direct messaging
D. Daily newspaper

3. Which of the following is a constraint of websites?

A. Their information can never be updated after publication.

B. Users generally need to open the website to access its content unless notifications are available.

C. Images and text cannot be combined.

D. A website is entirely a printed paper medium.

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4. Which statement best expresses the main principle for selecting the most appropriate media?

A. One medium is always ideal for every purpose.
B. No single medium is best for every purpose; selection should depend on purpose and audience, and media may be combined.
C. Television should always be used alone to avoid Internet costs.
D. SNS completely replaces websites and all other media.

Model C

Essay Questions:

1. Discuss the role and characteristics of printed newspapers compared with modern digital media, focusing on the way of interaction and physical presence.
……
2. Explain how an appropriate medium can be selected by analyzing the audience, purpose, and intended message.
……
3. Explain the importance of combining different media in communication campaigns and directing audiences effectively between them.
……
4. Distinguish between one-way and two-way interaction. Give one example of each.
……

Objective Questions (Multiple Choice):

1. Printed medium, that remains physically available, can be read without an Internet connection, and contains text and images.

A. Television
B. Newspaper
C. Website
D. Radio

2. Which medium is most appropriate for widespread through user sharing and word of mouth?

A. Radio
B. Printed newspaper
C. Social media
D. Individual email

3. Which statement describes a key characteristic of a website?

A. It is mainly one-way interaction, but two-way interaction can be provided through forms and comments.
B. It conveys sound only.
C. It can never be updated after publication.
D. It cannot be accessed through mobile browsers.

4. What is the main purpose of television or social-media advertising?

A. To provide detailed and structured information across many pages.
B. To inform many people at once.
C. To send a confidential message to one person.
D. To provide long articles that can be read offline.

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Unit 4: Web and Media Design

Lesson 4-2 Information Design and User Experience for Websites

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Explain what is meant by a persona. Explain how personas help a design team throughout the design process without relying on personal assumptions.

……

2. Explain the main purpose of a wireframe before visual design begins. Why is agreeing on the wireframe first useful for reaching agreement among stakeholders?

……

Objective Questions (Multiple Choice):

1. Which option best defines a persona?

A. A final visual design containing colors and decorative details.

B. A representation of a user type or persona, based as much as possible on research or data regarding their goals, needs, behavior, and context.

C. A tool for measuring server performance and response time.

D. A design approach that prioritizes only the convenience of the website creator and developers.

2. What does a wireframe represent when planning a website?

A. A final visual design containing all colors and decorative fonts.

B. A backend algorithm for organizing databases.

C. A rough blueprint of the layout of a web page to determine the placement and priority of information without considering visual design.

D. A tool for measuring page-loading speed on smartphones.

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Second: Homework

Essay Questions:

1. Distinguish between designing a website according to the creator's perspective and using a user-centered design (UCD) approach.

……..

2. What is meant by usability and accessibility in the context of website design?

……

Objective Questions (Multiple Choice):

1. Which term refers to how easily users can navigate the website and achieve their goals?

A. Accessibility
B. Usability
C. Visual contrast
D. Proximity

2. Which statement best describes accessibility in web design?

A. Designing content and interfaces so that people with disabilities can use and interact with the website.

B. Determining the placement and priority of elements with minimal visual detail.

C. Grouping related information close together.

D. Using the same font and color for headings on every page.

Second Period	**Week: ……**	**Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Explain the Contrast principle in CRAP. Describe how it can be applied to emphasize important elements and make the priority of information clear.

……..

2. Explain how applying the Proximity principle by placing related information close together helps users perceive it as a single group at a glance.

……..

.

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Objective Questions (Multiple Choice):

1. Which action is an appropriate application of the Repetition principle in web-page design (CRAP)?

A. Making headings large and changing their color randomly on every page.

B. Standardizing the font and color of headings across all pages to match the design of bullet point icons.

C. Distracting user's attention by scattering elements across the screen.

D. Hiding primary navigation buttons inside complex submenus.

2. Which statement best describes the primary rule of "Alignment" when designing an Arabic-language interface?

A. Align the left edges of text and elements precisely.

B. Elements should be positioned randomly without a common baseline.

C. Elements should follow the language direction and design grid, with main Arabic text consistently right-to-left.

D. Complex geometric decoration should be used to fill empty space.

Second: Homework

Essay Questions:

1. Identify the four CRAP design principles and briefly explain how they help organize the appearance of web pages.

.....

2. Explain how developing a persona, creating a wireframe, and applying the CRAP principles work together to achieve a successful user-centered design.

.....

Objective Questions (Multiple Choice):

1. Which CRAP design principle involves grouping product photos, names, and prices close together while leaving meaningful space between them?

A. Contrast
B. Repetition
C. Alignment
D. Proximity

2. Choose the one that is NOT an appropriate piece of information to include in setting up a persona for the target user:

A. The user's purpose for using the website.
B. The performance of the website's server.
C. The user's age and occupation.
D. The challenges the user faces.

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Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions:

1. Discuss the importance of understanding the user and their usage context as a first step in effective web design, and how this protects the design from the pitfall of relying on designer's personal taste.

.....

2. Explain the technical and design purpose of using a wireframe, clarifying why the selection of colors, fonts, and decorative elements is deferred to later stages.

.....

3. List the four CRAP design principles, explaining the functional purpose of each in facilitating page comprehension and the user browsing experience.

.....

4. Explain in details the role of the User-Centered Design (UCD) approach in improving usability metrics and digital accessibility for individuals with special needs.

.....

Objective Questions (Multiple Choice):

1. What does good web design start with?

A. Understanding the users, their needs, and their usage context, rather than relying on the designer's personal taste.

B. the selection of colors and luxurious visual elements, first.

C. writing backend code and managing databases.

D. increasing hosting server speed.

2. What is the correct description of a wireframe?

A. A preliminary layout featuring minimal visual detail to determine the placement and prioritization of elements prior to the final design.

B. Final design incorporating graphics and high-resolution images.

C. A software file for processing electronic payments.

D. Mobile internet browsing speed test tool.

3. What is the purpose of applying the principle of contrast in web page design?

A. Make headings clear and highlight important elements immediately.

B. Standardizing the font and color of headings across all pages.

C. Grouping related elements close together.

D. Aligning text along a common baseline

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4. Which statement best defines user-centered design (UCD)?

A. A design approach based on users, their needs, and their context of use.
B. An approach that prioritizes the convenience of website creators and developers.
C. An approach that relies entirely on the individual designer's preferences.
D. An approach that skips evaluating and reviewing the website with actual users.

Model B

Essay Questions:

1. Explain how a persona based on research or real data helps a team discuss the needs of a particular type of user accurately.

……

2. Explain how Contrast can emphasize headings and important buttons while maintaining readability and avoiding reliance on color alone.

……

3. Using examples, explain how Alignment can create a consistent visual system based on the design grid and language direction.

……

4. Explain the relationship between the UCD lifecycle and testing solutions with users to improve interfaces iteratively. Justify your answer.

……

Objective Questions (Multiple Choice):

1. What is the main benefit of using a persona in a web project?

A. It helps the team discuss the needs of a user type rather than relying on personal assumptions.

B. It increases website traffic through search engines.

C. It reduces image and media file sizes.

D. It increases page-loading speed on smart devices.

2. Which of the four principles of design involves aligning elements along a common baseline to give the screen a sense of order?

A. Contrast
B. Repetition
C. Alignment
D. Proximity

3. What does the Repetition principle do in web page design?

A. Repeats selected properties such as color, size, and font to create consistency and support navigation.
B. Groups related elements together.
C. Highlights important elements through clear visual differences.

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D. Defines element placement before visual design

4. Why are usability and accessibility studied?

A. To measure technical server performance.

B. To improve ease and effectiveness of task completion and enable people with disabilities to use the website effectively.

C. To reduce domain and hosting costs.

D. to design backend program code.

Model C

Essay Questions:

1. Explain how a carefully designed wireframe can help stakeholders and the technical team agree on the organization and placement of information independently of visual appearance

……

2. Compare Repetition and Proximity in terms of their visual effects on the organization of web-page content.

……

3. Explain how ignoring Accessibility standards can prevent certain groups of users, such as people with low vision or disabilities, from interacting effectively with the services provided by a website.

……

4. Describe the main stages of user-centered design (UCD) starting from understanding user needs to evaluating and testing the website.

……

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Objective Questions (Multiple Choice):

1. Which principle is responsible for grouping related information, such as product photos and prices, close together?

A. Proximity
B. Contrast
C. Repetition
D. Alignment

2. What does user-centered design (UCD) mean?

A. A design approach in which users, their needs, and context guide design decisions.

B. An advanced database-programming method.

C. An approach based entirely on developer intuition.

D. A network-error evaluation tool.

3. Why is visual styling delayed until after wireframing?

A. To keep discussion focused on information structure rather than personal visual preferences and help stakeholders agree on it.

B. To increase browser graphics speed.

C. To reduce server storage.

D. To avoid modern programming languages.

4. Which is correct for Arabic-language alignment?

A. Use a consistent right-to-left direction for main text.

B. Always use left-to-right direction.

C. Place words randomly.

D. Hide text in complex menus.

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Unit 4: Web and Media Design

Lesson 4-3 Methods for Evaluating Websites

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Distinguish between qualitative and quantitative evaluation in terms of the focus and purpose of each when evaluating websites.

……..

2. Explain usability testing as a qualitative evaluation technique and how it can improve user interface.

……

Objective Questions (Multiple Choice):

1. Which method is a qualitative evaluation tool used to understand the reasons behind users' behavior and experience?

A. Usability testing
B. Web analytics
C. A/B testing
D. Conversion rate (CVR)

2. Which evaluation approach measures behavior and outcomes using numerical data and clearly defined metrics?

A. Qualitative evaluation
B. Heuristic evaluation
C. Quantitative evaluation
D. Interview

Second: Homework

Essay Questions:

1. Briefly explain what is meant by "web analytics" and how it is used as a quantitative evaluation tool.

……...

2. State two key metrics used in web analytics and explain the purpose of each.

……

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Objective Questions (Multiple Choice):

1. In web analytics, what does PV metric represent?

A. The proportion of visits that achieved a target action.
B. The number of times a page has been viewed.
C. The proportion of visits that ended after viewing only the first page.
D. Bounce rate.

2. Which indicator measures the proportion of visits that achieved a target action such as purchase and registration?

A. Page views (PV)
B. Bounce rate
C. Conversion rate
D. Heuristic evaluation

Second Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Define heuristic evaluation. Who conducts it, and how is it related to user interface rules?

……..

2. State three examples of heuristics used to evaluate a user interface and briefly explain one of them.

……

Objective Questions (Multiple Choice):

1. What is meant by the term "Heuristic Evaluation"?

A. Measuring behavior using numerical data.
B. A method in which experts check UI (User Interface) by rules of thumb.
C. Testing two options to verify which leads to better results.
D. The total number of page views.

2. Which of the following is a basic heuristic for user interface design?

A. Bounce Rate
B. Page Views (PV)
C. Error prevention
D. Conversion Rate (CVR)

Second: Homework

Essay Questions:

1. Why is combining qualitative and quantitative evaluation more useful when evaluating a website than relying on only one of them?

……

2. Briefly explain how A/B testing can be used to measure user behavior and design outcomes.

……

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Objective Questions (Multiple Choice):

1. Which of the following metrics represents the percentage of sessions or users who left the site after viewing the first page only?

A. Page views (PV)
B. Conversion rate
C. Bounce rate
D. Heuristic evaluation

2. When web analytics show a high PV with a low CVR, this indicates that:

A. All visitors have successfully completed their purchases.

B. Many users reach the page but do not complete the intended action.

C. The website has received no visits.

D. The design is completely successful and requires no qualitative evaluation.

Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions:

1. Compare qualitative and quantitative evaluation, including techniques used in each method.

……

2. Explain page views (PV) and conversion rate (CVR), including the value and constraints of each indicator.

……

3. Explain heuristic evaluation, including who carries it out and the main user interface (UI) guidelines used.

……

4. Explain why a quantitative indicator alone cannot show why visitors leave a website, and how qualitative methods can address this gap.

……

Objective Questions (Multiple Choice):

1. Which method focuses on detailed understanding of the user experience and the reasons for behavior?

A. Qualitative evaluation
B. Quantitative evaluation
C. Web analytics
D. A/B testing

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2. What does PV measure in web analytics?

A. The percentage of users who leave the website.
B. The total number of page views.
C. The percentage of completed conversions only.
D. The exact number of unique visitors.

3. What term is used for an expert to check a user interface by thumb rules?

A. Heuristic evaluation
B. Usability testing
C. Bounce rate
D. Quantitative evaluation

4. Which of the following correctly describes usability testing?

A. Measuring users' behavior using numerical data.

B. Observing users performing actual tasks to identify areas that are difficult to use.

C. Comparing two options to determine which performs better.

D. Analyzing web data automatically.

Model B

Essay Questions:

1. Explain how usability testing is carried out and state its main purposes when studying users' behavior.

……

2. Discuss web analytics as a quantitative evaluation tool, explaining the different methods used to calculate indicators and the importance of checking the definition used by the analytics tool.

……..

3. State the three interface heuristics introduced in the lesson and explain visibility of system status and consistency.

……..

4. Explain how a website team should combine quantitative and qualitative methods to produce a more complete evaluation of a website.

……

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Objective Questions (Multiple Choice):

1. Which technique begins by observing users carrying out real tasks and may include interviews?

A. A/B testing
B. Usability testing
C. Heuristic evaluation
D. Web analytics

2. Which technique compares two options to verify which leads to better results?

A. Web analytics
B. Heuristic evaluation
C. A/B testing
D. Usability testing

3. What does PV measure?

A. Total number of views
B. Conversion rate
C. Bounce rate
D. Guidelines for Experts

4. Which indicator expresses the proportion of visits that ended after viewing only the first page?

A. Conversion rate (CVR)
B. Page views (PV)
C. Bounce rate
D. Heuristic evaluation

Model C

Essay Questions:

1. Explain the role of interviews in qualitative evaluation and how they help reveal users' voices, needs, and frustrations.

……

2. Explain A/B testing and how it can be used to compare two options to verify which leads to better results.

……

3. Explain bounce rate and why it must be interpreted according to the definition used by the analytics tool.

……

4. Discuss the critical importance of combining quantitative and qualitative data, using the evaluation of an online store as a practical example.

……..

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Objective Questions (Multiple Choice):

1. Which of the following tools is used to gather direct feedback from users to understand their needs and frustrations?

A. Interviews
B. Web analytics
C. A/B testing
D. Bounce rate

2. Which approach measures users' behavior and outcomes using numerical data and clearly defined metrics?

A. Qualitative evaluation
B. Quantitative evaluation
C. Heuristic evaluation
D. Usability testing

3. What platforms or tools collect, measure, and analyze website usage data to understand accessibility and user engagement?

A. Web analytics
B. Usability testing
C. Interviews
D. Heuristic evaluation

4. Which of the following heuristics aims to reduce the likelihood of users making errors?

A. Consistency
B. Visibility of system status
C. Error prevention
D. Conversion rate

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Unit 4: Web and Media Design

Lesson 4-4 The Iterative Improvement Process for Websites

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Explain why website improvement is an iterative process rather than a one-time task. Explain how the PDCA cycle helps organize this improvement.

……..

2. Describe the four stages of the PDCA cycle: Plan, Do, Check, and Act, And provide a simplified description of each of its four steps.

……

Objective Questions (Multiple Choice):

1. Which term describes a method that drives improvement by repeatedly applying Plan, Do, Check, and Act?

A. Design thinking
B. PDCA cycle
C. A/B testing
D. Continuous improvement

2. During the Plan stage of PDCA, what should the team do?

A. Implement changes immediately.

B. Measure results and compare them with the baseline.

C. Set a clear goal and plan an appropriate change.

D. Adopt what worked and revise the plan.

Second: Homework

Essay Questions:

1. Explain the common idea behind using PDCA, design thinking, and A/B testing to develop digital products rather than assuming that the first version is final.

……

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2. using an example, explain how the Do and Check stages could be applied to improve the completion rate of a website registration form.

……..

Objective Questions (Multiple Choice):

1. What does the "Act" step in the PDCA cycle mean if the change achieves the desired goal??

A. Completely changing the plan and cancelling the site
B. Approving or expanding the change
C. Restarting the Empathize phase
D. Measuring the bounce rate only, without making adjustments

2. Which statement best describes continuous improvement?

A. Build the website perfectly once and never modify it.
B. Change multiple elements at the same time.
C. Improve gradually through repeated cycles.
D. Rely only on developer's perspective and not on users.

First Period **Week: ……** **Date: .../.../.....**

First: Performance Tasks

Essay Questions:

1. Define design thinking. Explain how it supports discovering problems and generating solutions from the perspective of the user.

……

2. Name the five steps of design thinking and briefly explain Empathize and Define.

……

Objective Questions (Multiple Choice):

1. Which design-thinking stage involves understanding users' experiences and needs through observation, questions, and appropriate research?

A. Define
B. Ideate
C. Empathize
D. Test

2. Which stage involves quickly creating a prototype based on ideas?

A. Prototype
B. Test
C. Define
D. Empathize

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Second: Homework

Essay Questions:

1. Explain how A/B testing allows website designers to compare two options using real data. Include how visits are distributed between them.

……..

2. State two conditions required for a successful A/B test when the aim is to isolate the effect of one specific change.

……

Objective Questions (Multiple Choice):

1. Which definition best describes A/B testing?

A. Prepare two versions and compare them using a predefined metric and distribute users or visits between them as randomly as possible.

B. A method for creating a wireframe.

C. A computing approach based on quantum mechanics.

D. A method for analyzing only numerical website data.

2. In an A/B test intended to isolate the effect of changing one element, such as the color of a purchase button, what should be done?

A. Change multiple elements at the same time.

B. Make the difference between the two versions clear and limited to that element.

C. Rely on intuition without collecting enough data.

D. Avoid numerical metrics.

Third Period	Weekly assessments	Week:	Date: .../.../.....

Model (A)

Essay Questions:

1. Explain in detail why website improvement is iterative rather than a one-time task. Refer to the role of the PDCA cycle.

……

2. Explain design thinking as a flexible five-stage approach in which teams may move back and forth between stages rather than follow a rigid linear path.

……

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3. Explain how A/B testing compares two versions. Refer to the importance of a predefined metric, an analysis plan, and a sufficient sample.

……

4. Apply the PDCA cycle to a practical example in which the completion rate of a registration form is to be increased from 40% to 50%. Explain all four stages.

……

Objective Questions (Multiple Choice):

1. What is the term for the improvement method that repeats the four steps Plan → Do → Check → Act?

A. Design thinking
B. PDCA cycle
C. A/B testing
D. Prototype

2. What is the term for the way of thinking for discovering problems and generating solutions from the perspective of the user?

A. PDCA cycle
B. A/B testing
C. Design thinking
D. Continuous improvement

3. What is the term for the method in which two versions are prepared and compared with data to see which is more effective?

A. PDCA cycle
B. Design thinking
C. A/B testing
D. Empathize

4. Which description best matches the Test stage of design thinking?

A. Understand users through observation and questions.
B. Define the problem precisely.
C. Generate many possible ideas.
D. Allow users to try the prototype and collect their feedback.

Model B

Essay Questions:

1. Explain how user feedback and usage data help a team identify what works and what needs improvement on a website.

……

2. Explain the four stages of PDCA in detail: Plan, Do, Check, and Act.

……

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3. State the five stages of design thinking and briefly explain Ideate and Prototype.

……

4. Discuss why the difference between options A and B should be clear and limited in an A/B test. Explain why changing several elements at once measures the effect of the package of changes rather than one individual element.

……..

Objective Questions (Multiple Choice):

1. Which action corresponds to Check in the PDCA cycle?

A. Set the goal of reducing the bounce rate by 10%.

B. Change the design of the homepage.

C. Measure the bounce rate after the change and compare it with the baseline.

D. Adopt or extend the change.

2. Which is NOT appropriate when conducting an A/B test intended to isolate the effect of one element?

A. Prepare two versions and compare those two using real data.

B. Change multiple elements at the same time.

C. Make decisions only after collecting a sufficient amount of data.

D. Show each version to actual users.

3. Which statement best describes the concept of the website improvement process?

A. If a perfect website is built initially, no improvement is needed.

B. It is enough to improve only the visual design.

C. It is important to gradually improve by repeating evaluation and improvement.

D. All improvements should be done with A/B testing alone.

4. Which statement best describes design thinking?

A. A method that uses numerical data to analyze website usage.

B. A way of thinking that leads to discovering problems and generating solutions from the perspective of the user.

C. A method in which experts identify UI problems based on rules of thumb.

D. A method for creating JavaScript code diagrams.

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Model C

Essay Questions:

1. Explain how iterative improvement helps a team learn from results rather than assume that the first version will be ideal.

……

2. Discuss how design thinking can move back and forth between stages such as Empathize, Define, and Test rather than following a rigid one-way process.

……

3. Design an A/B test for a website with a low click-through rate on its purchase button. Specify the metric and explain how visits should be distributed.

……

4. Distinguish between the PDCA cycle, design thinking, and A/B testing in terms of their purpose and how each is carried out.

Objective Questions (Multiple Choice):

1. A flexible method for understanding a problem from the user's perspective, testing solutions, and then improving them through five steps is called:

A. PDCA cycle
B. Design thinking
C. A/B testing
D. Continuous improvement

2. A quick, testable prototype created based on ideas generated during the design thinking process is called:

A. Prototype
B. Classical bit
C. Edge computing
D. Check cycle

3. A method that compares two versions, A and B, using a predefined measure to determine which option performs better is called:

A. PDCA cycle
B. Design thinking
C. A/B testing
D. Baseline

4. The cycle that consists of (Plan, Do, Check, Act) and is widely used in business improvement and quality management is:

A. PDCA cycle
B. A/B testing
C. Design thinking
D. Empathy model

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