CERTIFIED PUBLIC ACCOUNTANT

FOUNDATION LEVEL 2 EXAMINATIONS

**F2.3: INFORMATION SYSTEMS**

DATE: TUESDAY 25, FEBRUARY 2025

MODEL ANSWERS & MARKING GUIDE

**QUESTION ONE**

**Marking Guide**

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| a | Award 2 marks for each correctly discussed elements of Group decision-support systems = 3 points * 2 marks = 6 maximum marks<br><br>Award 1 mark if answers are not discussed | 6 | |
| b | Award 1 mark for each correctly listed basic elements of a business intelligence environment = 6 points * 1 mark = 6 maximum marks | 6 | |
| c | Award 2 marks for each correctly explained stage in the decision-making process = 4 points * 2 marks = 8 maximum marks<br><br>Award 1 mark if answers are not explained | 8 | |
| | **Total Marks** | | **20** |

**Model Answer**

**a) Discuss THREE basic elements of group decision-support systems (GDSS).**

GDSS consists of three basic elements:

- **Hardware** includes the electronic conference facility itself (virtual room) that is laid out to support group collaboration. It also includes electronic hardware such as electronic display boards as well as audio-visual, computer and networking equipment.
- **Software** tools include electronic questionnaires, electronic brainstorming tools, tools for voting or setting priorities, stakeholder identification and analysis tools, and group dictionaries.
- **People** include the participants, a trained facilitator, and the staff to support the hardware and software.

**b) List SIX basic elements of a business intelligence environment.**

The Business Intelligence environment has six elements:

- Data from the business environment
- Business intelligence infrastructure
- Business analytics toolset
- Managerial users and methods
- Delivery platform – MIS, DSS, ESS

- User interface

## c) Explain FOUR stages in the decision-making process and how each can be supported by information systems.

The following are the four stages in the decision-making process and how each can be supported by information systems:

- **Intelligence:** This stage involves identifying and understanding the problems that are present in the organisation and their root cause and effect. MIS systems that provide a wide range of detailed reports and information can help in identifying problems. MISs that provide exception reports are particularly useful for identifying problems.
- **Design:** This stage involves identifying and investigating a number of possible approaches and solutions to the problem. DSSs are ideal in this stage for exploring alternatives because they include tools for analysing and modelling data, thus enabling users to explore various options quickly.
- **Choice:** This stage involves choosing from alternative solutions. DSSs can support managers in choosing the optimal solution. These DSSs can use complex analytic models to look at the various potential outcomes.
- **Implementation:** This stage involves implementing the chosen solution and monitoring to establish if the solution works. An MIS can be used to provide managers with routine reports on the progress of the solution.

## QUESTION TWO

## Marking Guide

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| a | Award 2 marks for each correctly discussed reason why computer-based systems tend to be more vulnerable to damage, error, and fraud than manual systems = 4 points * 2 marks = 6 maximum marks<br><br>Award 1 mark if answers are not discussed. Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 8 | |
| b | Award 2 marks for each correctly described major problem area resulting in information system failures (do not award additional marks for additional explanations per point) = 3 points * 2 marks = 6 maximum marks<br><br>Award 1 mark if answers are only listed. Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 6 | |

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| c (i) | Award 2 marks for a correct description or definition of E-mail hand held devices. Award 1 mark if the description is very short or poor. | 2 | |
| c (ii) | Award 2 marks for a correct description or definition of short message service (SMS). Award 1 mark if the description is very short or poor. | 2 | |
| c (iii) | Award 2 marks for a correct description or definition of Smart phones. Award 1 mark if the description is very short or poor. | 2 | |
| | **Total Marks** | | **20** |

**Model Answer**

**a) Discuss FOUR reasons why computer-based systems tend to be more vulnerable to damage, error, and fraud than manual systems.**

Computer based systems tend to be more vulnerable to damage, error, and fraud than manual systems for the following reasons:

- Data are stored in electronic format and are therefore not visible or easily auditable.
- Data are concentrated in electronic files and databases. A disaster such as a hardware or software fault, power failure or fire can be more far-reaching. An organization's entire record-keeping system could be destroyed.
- There may not be a visible trail to indicate what occurred for every computer process so errors entered in data can be very difficult to detect.
- Computer programs are also vulnerable as errors can be accidentally introduced when updates to the programs are installed. It can also be possible for programmers to make unauthorized changes to working systems.
- Many information systems can be accessed through telecommunications, and telecommunications can produce errors in data transmission.
- Data in files or databases can be accessed and manipulated directly in online systems. The data can be stolen, corrupted or damaged by hackers and computer viruses.
- Hardware equipment can be stolen – this is a growing problem because of the growth in mobile computing.

**b) Describe THREE major problem areas resulting in information system failures.**

The major problem areas are:

- **Design** - the system may fail to capture essential business requirements or improve organisational performance. Information may not be provided quickly enough to be helpful; it may be in a poor format or it may represent a wrong piece of data. The system may be

designed with poor user interface. If the system is not compatible with the structure, culture and goals of the organisation as a whole, it is unlikely to be a success.

- **Data** - the data may be inaccurate or inconsistent. The information in certain fields may be erroneous or ambiguous. The data may not be organised properly. Information required for a specific business function may be inaccessible because the data are incomplete.
- **Cost** - some systems operate well but their implementation cost may have gone way over budget. Other system projects may be too costly to complete. In either case, the excessive expenditures cannot be justified by the business value of the information they provide.
- **Operations** – the system does not run well. Information is not available in a timely and efficient manner. Jobs fail too often, leading to excessive reruns and late or missed schedules for delivery of information. The response time may be too long.

**c)** Briefly describe the following technologies for wireless transmission:

**i.    E-mail hand held devices.**

These devices include a small display screen and a keypad for typing short messages. Some versions of these devices have a built-in organiser, web and voice transmission features and the ability to integrate with corporate applications.

**ii.    Short message service (SMS).**

Short message service (SMS) is a text message service used by a number of digital cell phone systems to send and receive short alphanumeric messages usually less than 160 characters in length. Like e-mail, SMS messages can be forwarded and stored for retrieval later.

**iii.    Smart phones.**

This class of digital communications device combine the functionality of a Personal Digital Assistant (PDA) with a digital cell phone and require a cellular phone service connection. These smart phones can handle voice transmission and e-mail, save addresses, store schedules, access a private corporate network, and access information from the Internet. Smart phones include Web browser software that enable digital cellular phones to access Web pages formatted to send text or other information that is suitable for small screens. Increasingly smartphones are also fitted with built in Wi-Fi which can be used to provide high speed access to the Internet at a designated Wi-Fi enabled location.

**QUESTION THREE**

**Marking Guide**

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| a | Award 1 mark for each correctly stated advantage and disadvantage of Cloud Computing = 8 points * 1 marks = 8 maximum marks<br><br>Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 8 | |
| b | Award 1 mark1 for each correctly described benefit organizations can gain from implementing Enterprise resource planning (ERP) systems = 6 points * 1 mark = 6 maximum marks<br><br>Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 6 | |
| c (i) | Award 2 marks for a correct description or definition of Mobile Apps. Award 1 mark if the description is very short or poor. | 2 | |
| c (ii) | Award 2 marks for a correct description or definition of Android. Award 1 mark if the description is very short or poor. | 2 | |
| c (iii) | Award 2 marks for a correct description or definition of Apple Store. Award 1 mark if the description is very short or poor. | 2 | |
| | **Total Marks** | | **20** |

**Model Answer**

**a) State FOUR advantages and FOUR disadvantages of Cloud Computing.**

**Advantages of Cloud Computing**

The advantages associated with cloud computing include:

- It is not dependent on physical location of either resources or users.
- Users access computing resources on their own and are not necessarily dependent on IT staff.
- It is based on standard network and Internet devices.
- Resources serve multiple users with computing virtually assigned according to need.
- Resources are increased or decreased according to demand.
- Charges are based on the amount of resources actually used.
- Large investments in IT infrastructure are not necessarily needed or investments are significantly reduced.

- Firms can shift additional processing requirements to cloud computing during peak business periods.
- It allows a more flexible IT infrastructure.

**Disadvantages of Cloud Computing**

The disadvantages associated with cloud computing include:

- Responsibility for data storage and control is transferred away from the organization to a third party.
- Security risks and chances of data compromises are increased.
- Risk diminishing system reliability.
- Increased dependency on a third party.
- Huge investments in proprietary systems supporting unique business processes may be at risk.

**b) State SIX benefits organisations can gain from implementing Enterprise resource planning (ERP) systems.**

Organisations can gain substantial benefits from implementing ERP systems. These benefits include:

- Improved access to data for management reporting and decision making
- Helping to create a more disciplined organisational culture where decisions are based on accurate timely information
- Helping to provide management with a single organisational wide view
- Removal of inflexible legacy systems than can be expensive to change
- Improvement of work processes and making cross functional processes possible
- Enabling sharing of information across business functions
- Improvement of the technology infrastructure of the organisation
- The possibility to help an organisation become more customer focused

**c)** Briefly describe the following terms used in service-oriented architecture:

### i. Mobile Applications.

Apps are small pieces of software that run on the Internet, on your computer, or on your cell phone. The most popular apps are available for the iPhone, Android and Windows smartphones and tablet computers. They are generally delivered over the Internet.

### ii. Android.

Android is a mobile operating system based on a modified version of the Linux Kernel and other open-source software, designed primarily for touchscreen mobile devices such as smart phones

and tablets. Android is developed by a consortium of developers known as the Open handset Alliance, with the main contributor and commercial marketer being Google.

### iii. Apple Store.

The App Store is a digital distribution platform, developed and maintained by Apple Inc., for mobile apps on its iOS operating system. The store allows users to browse and download apps developed with Apple's iOS software development kit. Apps can be downloaded on the iPhone smartphone, or the iPad tablet computer, and some can be transferred to the Apple Watch smartwatch or newer Apple TVs as extensions of iPhone apps.


## QUESTION FOUR

### Marking Guide

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| a | Award 2 marks for each correctly discussed approach that can be implemented to protect the privacy of Internet users = 4 points * 2 marks = 6 maximum marks<br><br>Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 8 | |
| b | Award 2 marks for any valid reason why information systems testing is crucial = 2 marks<br><br>Award 2 marks for each correctly discussed stage of information system testing = 3 points * 2 marks = 6 maximum marks<br><br>2 marks + 6 marks = 8 maximum marks<br><br>Award 1 mark if answers are not discussed and simply listed. | 8 | |
| c | Award 2 marks for any valid explanation of Prototyping and 2 marks for any valid explanation of Application Software Packages<br><br>2 definitions * 2 marks = 4 maximum marks<br><br>Alternative valid explanations are acceptable. | 4 | |
| | **Total Marks** | | **20** |

**Model Answer**

**a) Discuss FOUR approaches that can be implemented to protect the privacy of Internet users.**

There are a range of approaches that can be implemented to protect the privacy of Internet users, these include the following:

- **Informed consent** means that an individual visiting a Web site knowingly consents to the collection of their data upon visiting the company's Web site. Federal privacy laws in United States help mediate the correct collection, usage and disclosure of information. Similar laws exist in the majority of European countries.
- **Self-regulation:** Businesses have taken some steps to enhance protection of Internet user's privacy, including publishing statements regarding how their information will be used and sometimes offering an opt-out right. However, few businesses offer an opt-in approach, which is far more favorable for protection of privacy, whereby it is prohibited to collect personal data unless the individual approves it.
- **Laws and privacy legislation:** These can help regulate the collection, usage, and disclosure of information.
- **Technical solutions:** Several technology tools are available to combat privacy invasion including e-mail encryption, anonymous e-mailing and surfing, cookie rejection and Spyware detection. The Platform for Privacy Preferences (P3P) is a benchmark for relating a Web site's privacy policy to its visitors to enable them to select the level of privacy they desire to maintain while using the Web site.

**b) Describe ONE reason why information systems testing is crucial and discuss THREE stages of information system testing.**

Testing is critical to the success of a system because it checks that the system will produce the expected results under specific conditions. The testing will find any errors (bugs) in the computer code. Comprehensive testing can be a time consuming and expensive process. Exhaustive and thorough testing must be conducted to ascertain whether the system produces the right results. Testing answers the question: Will the system produce the desired results under known conditions?

There are normally **three stages of information system testing**: unit testing, system testing and acceptance testing.

- **Unit testing (program testing)** involves testing the smallest piece of testable software in the application, usually the individual programs. The purpose of this testing is to locate errors in the code so that they can be corrected. Unit testing is normally carried out by the programmers.

- **System testing** which is normally carried out on a complete integrate system, involves testing the functionality of the information system as a whole to determine whether program modules are interacting as planned and to establish that the system meets its specified requirements.
- **Acceptance testing** is normally the final stage of testing performed on a system. Its purpose is to establish that the requirements defined in the analysis and design stages have been met. Acceptance testing is normally carried out by the end users of the system.

**c) Briefly explain Prototyping and Application Software Packages as used in system development.**

**Prototyping** consists of building an experimental system rapidly and inexpensively for end users to evaluate. By interacting with the prototype, users can get a better idea of their information requirements. The prototype endorsed by the users can be used as a template to create the final system.

The prototype is a working version of an information system or part of the system, but it is meant to be only a preliminary model. Once operational, the prototype will be further refined until it conforms precisely to users' requirements. Once the design has been finalized, the prototype can be converted to a polished production system.

An **application software package** is a set of prewritten, pre-coded application software programs that are available for sale or lease. Packages range from very simple programs to very large and complex systems such as ERP systems. Packages are normally used when functions are common to many companies and when resources for in-house development are not available. Examples of application packages include payroll packages, accounting packages, inventory control applications and supply chain applications.

**QUESTION FIVE**

**Marking Guide**

| QN | Description | Marks | Total Marks |
|----|-------------|-------|-------------|
| a | Award 1 mark for each correctly stated capability of a database management system (DBMS) = 6 points * 1 mark = 6 maximum marks<br><br>Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 6 | |
| b | Award 2 marks for any valid definition of 'data mining' = 2 marks | 10 | |

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| | Award 2 marks for each correctly explained type of information obtainable from data mining = 4 points * 2 marks = 8 maximum marks<br><br>2 marks + 8 marks = 10 maximum marks<br><br>Award 1 mark if answers are not discussed. Other answers offered by candidates but not in the model answer are acceptable if they are valid. | | |
| c | Award 1 mark for each correctly listed component of a firm's information technology (IT) infrastructure = 4 points * 1 mark = 4 maximum marks<br><br>No need for explanations but they are not penalized if offered by candidates. | 4 | |
| | **Total Marks** | | **20** |


**Model Answer**

**a) State SIX capabilities of a database management system (DBMS).**

The capabilities of the DBMS include the following:

- Controlling redundancy of persistent data
- Providing efficient ways to access a large amount of data
- Supporting a logical data model
- Supporting high-level languages to define the structure of data, access data and manipulate data
- Enabling concurrent access to data by multiple users
- Maintaining the integrity of the data
- Protecting the data from unauthorized access and malicious use
- Recovering from failures without losing data
- Being able to represent complex relationships among data
- Enforcing integrity constraints
- Providing persistent storage for program objects and data structures

**b) Define the term 'data mining' and explain FOUR types of information obtainable from data mining.**

**Data mining** is the analysis of data for hidden relationships. Data mining provides insights into corporate data that cannot be obtained with OLAP by finding hidden patterns and relationships

in large databases and inferring rules from them to predict future behavior. The patterns and rules are used to guide decision-making and forecast the effect of those decisions.

The types of information obtainable from data mining include associations, sequences, classifications, clusters, and forecasts.

- **Associations** are occurrences linked to a single event. For instance, a study of supermarket purchasing patterns might reveal that, when corn chips are purchased, a cola drink is purchased 65 percent of the time, but when there is a promotion, cola is purchased 85 percent of the time. This information helps managers make better decisions because they have learned the profitability of a promotion.
- In **sequences**, events are linked over time. We might find, for example, that if a house is purchased, a new refrigerator will be purchased within two weeks 65 percent of the time, and an oven will be bought within one month of the home purchase 45 percent of the time.
- **Classification** recognizes patterns that describe the group to which an item belongs by examining existing items that have been classified and by inferring a set of rules. For example, businesses such as credit card or telephone companies worry about the loss of steady customers. Classification helps discover the characteristics of customers who are likely to leave and can provide a model to help managers predict who those customers are so that the managers can devise special campaigns to retain such customers.
- **Clustering** works in a manner similar to classification when no groups have yet been defined. A data mining tool can discover different groupings within data, such as finding affinity groups for bank cards or partitioning a database into groups of customers based on demographics and types of personal investments.
- Although these applications involve predictions, **forecasting** uses predictions in a different way. It uses a series of existing values to forecast what other values will be. For example, forecasting might find patterns in data to help managers estimate the future value of continuous variables, such as sales figures.

**c) List FOUR components of a firm's information technology (IT) infrastructure.**

IT infrastructure consists of:

- Computer hardware
- Computer software
- Data management software
- Networking and telecommunications technology

**QUESTION SIX**

**Marking Guide**

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| a | Award 1 mark for each correctly listed Internet business model for electronic commerce = 4 points * 1 marks = 4 maximum marks<br><br>Since there are 8 possible answers, any of the 8 models is acceptable. No need for explanations but they are not penalized if offered by candidates. | 4 | |
| b | Award 2 marks for each correctly discussed benefit of e-commerce to the organisation = 6 points * 2 marks = 12 maximum marks<br><br>Award 1 mark if answers are not discussed. Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 12 | |
| c | Award 2 marks for each correctly stated reason why m-commerce represents a tiny fraction of global online purchases = 2 points * 2 marks = 4 maximum marks<br><br>Award 1 mark if answers are only listed. Other answers offered by candidates but not in the model answer are acceptable if they are valid. | 4 | |
| | **Total Marks** | | **20** |

**Model Answer**

**a) List any FOUR Internet business models for electronic commerce.**

There are eight Internet business models:

- **Virtual storefront:** These sell physical products directly to consumers or individual businesses. Online retail stores are also called e-tailers.
- **Information broker:** These provide product, pricing, and information to individuals and businesses. They generate revenue from advertising and from directing buyers to sellers.
- **Transaction broker:** The transaction broker processes online sale transactions for consumers and generates a fee each time.
- **Online marketplace:** An online marketplace provides a digital environment where buyers and sellers meet, search for and display products, and set prices for those products. It can also provide online auctions facilities to users.

- **Content provider:** A content provider creates revenue by providing digital content, such as digital news, music, photos, or video on the Web. Some newspapers and magazines are now pursuing this online strategy.
- **Online service provider:** The online service provider supplies online services for individuals and businesses and generates revenue from subscription or transaction fees and from advertising. An example of an online service provider is salesforce.com who provides a Web based Customer Relationship Management (CRM) solution for businesses.
- **Virtual community:** The virtual community provides an online meeting place where people with similar interests can communicate and find useful information. These include YouTube, and social networking sites such as Facebook and Myspace.
- **Portal:** The portal provides an initial point of entry to the Web along with specialized content and other services. Examples of portals include Google, Bing, Yahoo, MSN etc.

**b) Discuss SIX benefits of e-commerce to the organisation.**

The benefits to the organisation include:

- **Global reach:** e-commerce expands the company's marketplace to national and international markets.
- **Cheaper supplies:** Enables companies to buy materials and services from other companies rapidly and at less cost.
- **Reduced Costs:** Decreases the cost of creating, processing, distributing, storing, and retrieving information by digitizing the process.
- **Speeds up the flow of goods:** Allows businesses to carry lower levels of inventories by facilitating just in time strategies.
- **Improved customer service:** It enables companies to provide product support and creates the possibility of a 24-hour service. It also allows companies to provide enhanced services to customers.
- **Others:** It helps small businesses compete against large companies and it provides advertising opportunities.

**c) State TWO reasons why m-commerce represents a tiny fraction of global online purchases.**

There are a number of factors that contribute to this including:

- Keyboards and screens on cell phones are still small and awkward to use.
- Relatively slow data transfer speeds on cellular networks, even on third generation networks, results in higher costs to customer.
- Mobile phones usually have limited memory and power supplies.
- Fraud uncertainties & security concerns
- Lack of familiarity with product/services/brands in rural people

- It demands technology access
- Trust issues with Shipment Companies
- Less customer interaction


**QUESTION SEVEN**

**Marking Guide**

| QN | Description | Marks | Total Marks |
|---|---|---|---|
| a | Award 2 marks for any valid definition of the term 'Computer forensics' = 2 marks<br><br>Award 2 marks for each correctly discussed general computer systems control = 3 points * 2 marks = 6 maximum marks<br><br>Since there are 6 possible general controls, any 3 of the 6 models are acceptable. | 8 | |
| b | Award 2 marks for any valid definition of the term 'Ethics' = 2 marks<br><br>Award 1 mark for each correctly described moral dimension of information systems (No need for detailed explanations but they are not penalized if offered by candidates) = 5 points * 1 mark = 5 maximum marks | 7 | |
| c | Award 1 mark for each correctly outlined example of Ethical Dilemmas related to Information Technology (IT) systems = 5 points * 1 mark = 5 maximum marks<br><br>Other answers offered by candidates but not in the model answer are acceptable if they are valid.<br><br>No need for detailed explanations but they are not penalized if offered by candidates. | 5 | |
| | **Total Marks** | | **20** |


**Model Answer**

a) **Define the term 'Computer forensics' and discuss any THREE general computer systems controls.**

**Computer forensics** is the scientific collection, examination, authentication, preservation, and analysis of data held on or retrieved from computer storage media in such a way that the information can be used as evidence in a court of law.

There are six principal **general controls**, which include software controls, hardware controls, computer operations controls, data security controls, system implementation controls and administrative controls:

- **Computer software** security can be promoted by program security controls to prevent unauthorised changes to programs in production systems. Software security is also promoted by system software controls that prevent unauthorised access to system software and log all system activities.
- **Computer hardware** security can be promoted by locating hardware in restricted rooms where only authorised individuals can access it. Special safeguards against fire, high temperature, and electric power disruptions can be implemented.
- **Computer operations controls** oversee the work of the computer department, ensuring that procedures for storage and processing of data are followed. Computer operations controls include the setup of computer processing jobs, computer operations and computer backup and restore procedures.
- **Data security controls** prevent unauthorised changes, deletion or access to data while the data is in use or in storage. Data security software can be configured to restrict access to individual files, data fields or groups of records. Data security software often features logs that record users who access or update files. Data storage media can be physically secured to prevent access by unauthorised personnel.
- **System implementation controls** ensure that the systems development process is properly controlled and managed. A system development audit checks that formal reviews and signoff were done by users and management at the various stages of the development process. The audit should look for the use of controls and quality assurance techniques for program development, conversion and testing and for complete system documentation.
- **Administrative controls** are formalised standards, rules, procedures and control disciplines to ensure the organisations general and application controls are properly executed and enforced.

**b) Define the term 'ethics' and briefly describe FIVE moral dimensions of information systems.**

**Ethics** refers to the principles of right and wrong that individuals, acting as free moral agents, use to make choices to guide their behavior.

There are five moral dimensions of information systems as follows:

- **Information Rights:** What information rights do individuals and organisations have with respect to information about themselves? There are also moral obligations for those dealing with this information.
- **Property Rights:** How will intellectual property rights be protected in a digital society, where traditional measures that protect property are no longer applicable?

- **Accountability and Control:** Who can be held responsible for damage caused to individual information and property?
- **System Quality:** Data quality and system errors - No software program is perfect, errors will be made, even if the errors have a low probability of occurring
- **Quality of Life:** What values should be retained in an information society? Which cultural values and practices are supported by the new information technology?

**c) Outline FIVE examples of Ethical Dilemmas related to Information Technology (IT) systems.**

The following are some real-world examples of ethical dilemmas:

- Using IT systems to increase efficiency can have the knock-on effect of causing layoffs and personal hardships
- Using IT systems to monitor employee e-mail in order to protect valuable company assets, is coupled with the ethical dilemma of invading employee privacy
- Monitoring employees' use of the Internet at work similarly decreases employee privacy
- Cybersecurity vs. Access: Deciding how much security to implement versus ensuring accessibility. For instance, should a government agency weaken encryption protocols to facilitate law enforcement access to encrypted communications?
- Intellectual Property Rights: Addressing issues such as software piracy, plagiarism, and unauthorized use of proprietary information. For example, is it ethical to use open-source software components without complying with their licensing terms?
- Artificial Intelligence (AI) Bias: Managing biases in algorithms that can perpetuate discrimination. For instance, should AI-driven recruitment tools be used if they consistently favor certain demographics over others?
- Environmental Impact: Considering the environmental consequences of IT systems, such as energy consumption and electronic waste. For example, is it ethical to prioritize the speed and performance of data centers over their environmental footprint?

## End of Marking Guide and Model Answers