# CERTIFIED PUBLIC ACCOUNTANT

# FOUNDATION LEVEL 2 EXAMINATIONS

# F2.3: INFORMATION SYSTEMS

# DATE: TUESDAY 26 AUGUST 2025

# MARKING GUIDE AND MODEL ANSWERS

**QUESTION ONE**

**Marking guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 0.5 mark for each explained category. If outlined only 0.5 mark | 4 |
| b) | 2 marks for the definition of hardware platforms. If outlined only 1 mark | 12 |
| c) | 1 mark for each outlined trends hardware | 4 |
| | **Total** | **20** |

**MODEL ANSWERS**

**a)** As a specialist in the field, identify and briefly explain at least four ethical and social issues related to information systems that Umuringa LTD is currently facing.

1. **Data privacy and customer consent**: Umuringa LTD collects and processes sensitive customer data such as purchase histories and personal preferences to personalize its services. The ethical issue arises in ensuring that data collection is transparent and that explicit consent is obtained.

2. **Security of customer information:** Handling personal and financial data online introduces the risk of unauthorized access, data breaches, or cyberattacks. Umuringa must implement robust security protocols like encryption, firewalls, and secure authentication processes.

3. **Digital equity and accessibility:** Serving a global customer base means recognizing differences in technological access. Some customers may rely on low-bandwidth connections or older devices. If the platform is designed only for high-end devices with modern interfaces, it risks alienating these users.

4. **Algorithmic fairness and bias:** If Umuringa leverages algorithms or AI for tasks like product recommendations, price adjustments, or fraud detection, there's a risk of unintentional bias.
**5. Intellectual property & content use**: In online trading, user-generated content such as reviews or shared images is common. Umuringa must respect intellectual property rights, ensuring users own their content and using it only with permission.

6. **Workplace ethics & surveillance:** Internally, systems may be used to track employee productivity or behavior. While such monitoring can boost efficiency, excessive surveillance risks infringing on employees' privacy and autonomy.

**b)** Information systems to function effectively, they rely on an infrastructure primarily made up of hardware and related components. As afield expert, discuss at least six different types of hardware platforms involved in supporting information systems.

1. **Servers:** Servers are powerful computers designed to manage, store, and process data for multiple users simultaneously. They host applications, websites, databases, and files, acting as the backbone of many business information systems.

2. **Client Devices (Desktops and Laptops):** These are end-user machines that allow individuals to interact with information systems. Employees use desktops and laptops to input data, access applications, and perform business tasks.

3. **Mobile Devices (Tablets and Smartphones):** With the rise of mobile computing, smartphones and tablets are now essential hardware platforms. They support mobile applications, remote access to enterprise systems, and real-time data entry, making business operations more flexible and responsive.

4. **Data Storage Devices**: These include hard drives (HDDs), solid-state drives (SSDs), and network-attached storage (NAS) units. They store vast amounts of digital information files, databases, system backups and ensure data is accessible, secure, and retrievable when needed.

5. **Networking Devices**: Routers, switches, hubs, and modems are critical for enabling connectivity across an organization. They ensure that information flows efficiently between devices, servers, and the internet, making communication and data sharing seamless within and outside the business.

6. **Input Devices:** These include keyboards, mice, scanners, barcode readers, and biometric scanners. They are used to capture and enter data into information systems, playing a crucial role in the accuracy and speed of data collection and processing.

7. **Output Devices:** Devices like monitors, printers, and speakers fall under this category. They present processed information in a human-readable form, allowing users to interpret, act on, or distribute the results produced by information systems.

8. **Cloud Infrastructure Platforms**: While not physical in the traditional sense, cloud platforms (e.g., AWS, Microsoft Azure, Google Cloud) offer virtualized hardware resources over the internet. These platforms support data storage, computing power, and application hosting, giving organizations flexibility, scalability, and cost efficiency.

**c)** As technology rapidly evolves due to institutional competition and innovation, organizations are compelled to adapt to emerging technological trends. Outline at least four latest trends in hardware platforms**.**

1. Cloud Computing and Virtualization.
2. Edge Computing.
3. Hyper converged Infrastructure (HCI).
4. AI-Optimized Hardware.
5. Energy-Efficient and Sustainable Hardware.

6. 5G Integration.
7. Internet of Things (IoT) devices

## QUESTION TWO

**Marking Guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 2 marks for each discussed component. Outline only is 1 mark | 10 |
| b) | 1 mark for each explained benefit. Outline only is 0.5 mark | 4 |
| c) | 2 marks Each explained. If outlined only 1 mark | 6 |
| | **Total** | **20** |

## MODEL ANSWERS

**a)** Explain five key advantages of implementing supply chain management systems. Highlight how these systems contribute to improving efficiency, reducing costs, enhancing collaboration, and strengthening overall business performance.

1. **Improved operational efficiency:** SCM systems streamline supply chain activities such as procurement, production, inventory, and logistics by automating tasks and optimizing workflows. This reduces delays, minimizes errors, and enhances the overall speed and accuracy of operations.

2. **Cost reduction:** By providing real-time visibility into supply chain processes, SCM systems help identify inefficiencies, reduce excess inventory, avoid stock outs, and minimize transportation costs. This leads to significant savings in both operational and logistical expenses.

3. **Enhanced collaboration with partners:** SCM systems facilitate better communication and data sharing between suppliers, manufacturers, distributors, and retailers. This collaboration fosters stronger relationships, improves coordination, and ensures that all stakeholders are aligned in meeting customer demands.

4. **Better demand forecasting:** Advanced analytics and forecasting tools within SCM systems allow businesses to predict customer demand more accurately. This enables better planning, reduces waste, and ensures that resources are allocated efficiently to meet market needs.

5. **Greater supply chain visibility:** With real-time tracking and monitoring features, SCM systems provide end-to-end visibility of the supply chain. This transparency enables quicker identification of issues, improved risk management, and informed decision-making.

6. **Improved customer satisfaction:** Efficient supply chain operations ensure that products are delivered on time and in the right condition. By meeting customer expectations consistently, companies can build trust, encourage repeat business, and strengthen brand loyalty.

7. **Competitive advantage**: Organizations that implement robust SCM systems can respond more quickly to market changes, adapt to disruptions, and optimize their resources. This agility gives them a strategic edge over competitors who rely on less integrated systems.

**b)** Outline four key benefits of implementing Enterprise Resource Planning (ERP) systems, and briefly explain how they enhance organizational efficiency, streamline processes, and support better decision-making across various departments.

1. **Centralized data management**: ERP systems consolidate data from various departments into a single platform, reducing duplication and improving accuracy. This centralized access ensures that all departments work with the same real-time information, promoting consistency and informed decision-making.
2. **Streamlined business processes**: By integrating core functions such as finance, inventory, procurement, HR, and sales, ERP systems automate and standardize workflows. This reduces manual tasks, minimizes errors, and improves the overall speed and efficiency of operations.

3. **Improved decision-making:** With real-time analytics, dashboards, and reporting tools, ERP systems provide management with valuable insights into organizational performance. This enables timely, data-driven decisions and proactive problem-solving across all departments.

4. **Enhanced collaboration across departments:** ERP systems break down silos by facilitating seamless communication and sharing information between departments. This leads to better coordination, fewer misunderstandings, and a more cohesive organizational workflow.

5. **Regulatory compliance and risk management**: ERP systems often include built-in tools to help organizations comply with financial regulations, industry standards, and data privacy laws. They also provide audit trails and reporting features that support accountability and reduce compliance risks.

6. **Scalability and flexibility**: Modern ERP systems are designed to grow with the business. They can be scaled to support increased operations, new business units, or additional features, making them a long-term solution for evolving organizational needs.

7. **Record keeping and documentation**: GDSS automatically records discussions, votes, decisions, and supporting data, creating a clear audit trail. This documentation can be reviewed later for accountability, transparency, and future reference.

8. **Support for remote and diverse teams:** In today's global work environment, GDSS allows diverse and geographically dispersed teams to participate in decision-making processes. This inclusivity improves the quality of ideas and leads to more comprehensive solutions.

**c)** Briefly explain at least three advantages that Group Decision Support Systems (GDSS) offer to an organization.

1. **Enhanced collaboration:** GDSS enables team members to collaborate effectively, regardless of their physical location. It supports real-time communication and data sharing, which helps improve group participation and encourages contributions from all members.

2. **Improved decision quality:** By providing structured frameworks, analytical tools, and access to relevant data, GDSS helps teams make more informed and objective decisions. It reduces the influence of bias or dominant personalities by promoting equal input from participants.

3. **Faster decision-making:** GDSS streamlines the decision-making process by organizing discussions, automating data analysis, and summarizing input quickly. This saves time, especially in complex decision scenarios involving multiple stakeholders.

4. **Record keeping and documentation:** GDSS automatically records discussions, votes, decisions, and supporting data, creating a clear audit trail. This documentation can be reviewed later for accountability, transparency, and future reference.

5. **Support for remote and diverse teams:** In today's global work environment, GDSS allows diverse and geographically dispersed teams to participate in decision-making processes. This inclusivity improves the quality of ideas and leads to more comprehensive solutions.

## QUESTION THREE

**Marking guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 2 marks for each explained. Outline only is 1 mark | 8 |
| b) | 2 Marks for the explanation. Outline only is 1 mark | 6 |
| c) | 2 marks for each explained. Outline only is 1 mark | 6 |
| | **Total** | **20** |

## MODEL ANSWERS

**a)** Explain at least four additional tools and technologies that can be used to safeguard information resources. Describe how each tool contributes to enhancing security and protecting sensitive data from unauthorized access.

1. **Firewalls:** Firewalls act as the first line of defense by monitoring and controlling incoming and outgoing network traffic based on predetermined security rules. They block unauthorized access and help prevent malicious attacks from external sources.

2. **Antivirus and anti-Malware software:** These tools detect, prevent, and remove malicious software such as viruses, worms, ransomware, and spyware. They regularly scan systems and files to protect against threats that can compromise data integrity and confidentiality.

3. **Encryption technologies:** Encryption converts sensitive data into coded formats that can only be read by authorized parties with the correct decryption keys. This ensures that data remains secure during storage and transmission, protecting it from interception or theft.

4. **Intrusion Detection and Prevention Systems (IDPS**): IDPS monitor network and system activities for suspicious behavior or policy violations. They can alert administrators of potential threats and automatically take action to block or mitigate attacks, thereby reducing the risk of security breaches.

5. **Multi-Factor Authentication (MFA**): MFA adds an extra layer of security by requiring users to provide two or more verification factors such as a password, fingerprint, or one-time code before granting access to systems or data. This reduces the likelihood of unauthorized access even if passwords are compromised.

6. **Security Information and Event Management (SIEM):** SIEM systems collect and analyze security data from across an organization's infrastructure in real-time. They help identify and respond to threats faster by correlating events, generating alerts, and providing comprehensive security insights.

**b)** Briefly give explanation of at least three security and control mechanisms that can be implemented to ensure maximum protection of information systems. Describe how each mechanism contributes to maintaining the confidentiality, integrity, and availability of data**.**

1. **Access Control:** Access control restricts system and data access to authorized users only, using methods like passwords, role-based permissions, or biometrics. This mechanism maintains confidentiality by preventing unauthorized users from viewing sensitive information.

2. **Encryption:** Encryption transforms data into an unreadable format for anyone without the decryption key. It protects data during storage and transmission, ensuring confidentiality and integrity by preventing unauthorized disclosure and tampering.

3. **Firewalls:** Firewalls act as barriers between trusted internal networks and untrusted external networks, filtering incoming and outgoing traffic based on security rules. They help maintain availability by blocking malicious traffic that could disrupt systems, and confidentiality by preventing unauthorized network access.

4. **Intrusion Detection and Prevention Systems (IDPS):** IDPS monitor network and system activities to detect suspicious or malicious behavior. By alerting administrators and taking automated action, these systems preserve the integrity and availability of information systems by stopping attacks before they cause damage.

5. **Regular backups:** Backing up data regularly ensures that copies of critical information are available in case of data loss, corruption, or ransomware attacks. This mechanism guarantees availability and helps maintain integrity by allowing systems to be restored to a known good state.

**c)** Identify and discuss at least three key challenges commonly faced by enterprise knowledge management systems of your choice. Explain how these challenges impact the effective capture, sharing, and utilization of knowledge within an organization.

1. **Knowledge capture difficulties**: Capturing tacit knowledge personal know-how and experiences is often challenging because it resides in employees' minds and is not easily documented. This limits the organization's ability to fully preserve valuable insights and expertise.
2. **User Adoption and engagement:** If employees do not actively use or contribute to the KMS, the system's value diminishes. Low user engagement can result from poor system design, lack of training, or resistance to change, hindering effective knowledge sharing and collaboration.

3. **Information overload:** When too much information is stored without proper organization or filtering, users can become overwhelmed. This makes it difficult to find relevant knowledge quickly, reducing the system's efficiency and frustrating users**.**

4. **Data quality and accuracy:** Outdated, incorrect, or incomplete knowledge can mislead users and result in poor decisions. Maintaining high data quality requires continuous monitoring and validation, which can be resource intensive.

5. **Security and privacy concerns:** Protecting sensitive knowledge such as proprietary data or employee information is critical. Balancing open knowledge sharing with appropriate security controls is complex, and breaches can lead to loss of competitive advantage or legal issues.

6. **Integration with existing systems:** Many organizations use multiple software platforms. If the KMS does not integrate smoothly with other business systems (like CRM or ERP), it can create silos, reduce accessibility, and complicate workflows, limiting the system's overall effectiveness.

**QUESTION FOUR**

**Marking guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 2 marks for each explained. Outline only is 1 mark | 10 |
| b) | 2 Each discussed. Outline is 1 mark | 4 |
| c) | 2 marks for each explained. Outline only is 1 mark | 6 |
| | **Total** | **20** |

**MODEL ANSWERS**

**a)** While e-commerce services often succeed by leveraging databases to enhance business performance, firms also encounter several challenges in their use of databases. Explain at least five common challenges organizations face when managing and utilizing databases.

1. **Data security and privacy:** Protecting sensitive customer and business data from unauthorized access, breaches, and cyberattacks is a major concern. Ensuring compliance with data protection regulations adds complexity to database management.

2. **Data quality and integrity:** Maintaining accurate, consistent, and reliable data is challenging, especially with frequent updates and inputs from multiple sources. Poor data quality can lead to incorrect business insights and decisions.

3. **Scalability issues:** As businesses grow and data volumes increase, databases must scale efficiently to handle higher loads without performance degradation. Scaling databases can require costly infrastructure upgrades and complex configurations.

4. **Complex data integration:** Integrating data from diverse sources and systems (e.g., CRM, ERP, social media) into a unified database can be complicated. Inconsistent formats and data duplication may lead to errors and inefficiencies.

5. **Backup and recovery challenges:** Ensuring regular, reliable backups and quick recovery from data loss or corruption is critical but complex. Failure in backup processes can result in significant operational disruptions and data loss.

6. **Database performance optimization:** Maintaining optimal database speed and responsiveness requires ongoing tuning and optimization, such as indexing, query optimization, and resource management. Poor performance can impact user experience and business operations.

7. **Cost of database management:** Managing databases involves expenses related to hardware, software licenses, skilled personnel, and maintenance. Balancing cost-efficiency with performance and security needs is a constant challenge.

b) Briefly explain at least two similarities and two differences between traditional commerce and electronic commerce, highlighting how each operates and serves customers.

**Similarities:**

1. **Goal of exchange**: Both traditional and electronic commerce aim to facilitate the exchange of goods and services between buyers and sellers.

2. **Customer focus**: In both models, meeting customer needs and providing value are central to business success.

3. **Payment methods**: Both involve financial transactions, although the modes of payment may differ.

4. **Marketing efforts**: Advertising and promotional activities are essential in both attracting and retaining customers.

**Differences:**

1. **Mode of interaction**: Traditional commerce relies on physical, face-to-face interactions, while electronic commerce operates digitally through online platforms and websites.

2. **Geographical reach**: Traditional commerce is often limited to local or regional markets, whereas e-commerce can reach a global audience instantly.

3. **Operating hours**: Physical stores have fixed opening hours, whereas e-commerce platforms are accessible 24/7, providing customers with greater convenience.

4. **Cost structure**: Traditional commerce involves higher costs related to physical storefronts, inventory storage, and in-person staffing, while e-commerce typically has lower overhead expenses but requires investment in technology and digital infrastructure.

c) While e-commerce operates on a global scale and offers many advantages, it also faces several challenges on the international front. Discuss three key challenges that e-commerce encounters on the global context**.**

1. **Cross-border legal and regulatory compliance:** E-commerce businesses must navigate a complex landscape of laws and regulations that vary by country such as consumer protection, taxation, data privacy, and customs rules. Non-compliance can lead to fines, legal disputes, or barriers to market entry.

2. **Payment and currency issues**: Handling multiple currencies, payment methods, and cross-border transaction fees can complicate payment processing. Differences in banking systems and payment preferences also affect customer experience and trust.

3. **Logistics and delivery challenges:** Shipping products internationally involves dealing with customs, varying delivery times, higher costs, and potential delays. Ensuring reliable, timely delivery while managing these factors is a major operational challenge.

4. **Cultural and language barriers**: understanding and catering to diverse cultural preferences, languages, and buying behaviors is crucial for success. failure to localize content, marketing, and customer support can limit market acceptance.

5. **Cybersecurity risks:** operating globally exposes e-commerce businesses to a broader range of cyber threats, including fraud, hacking, and data breaches. protecting customer data and securing transactions across borders requires advanced security measures.

6. **Platform competition and market saturation:** dominant platforms like amazon and alibaba create intense competition, especially for smaller sellers. standing out in crowded markets requires high marketing costs and constant innovation.

7. **Infrastructure and internet access:** in developing regions, poor internet access and limited digital infrastructure restrict e-commerce growth. businesses may struggle to reach customers who are offline or have unreliable connectivity.

**QUESTION FIVE**

**Marking guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 2 marks Each outlined with simple explanation. Outline only is 1 mark | 10 |
| b) | 1 mark each outline and 1 mark for explanation | 4 |
| c) | 1 mark each outline and 1 mark for explanation | 6 |
| | **Total** | **20** |

**MODEL ANSWERS**

**a)** Explain five key management challenges that modern businesses encounter when dealing with information systems with their overall business objectives in today's dynamic and technology-driven environment.

1. **Aligning IT strategy with business goals**: Ensuring that information systems support and drive the company's strategic objectives is a continual challenge. Misalignment can lead to wasted resources and missed opportunities for competitive advantage.

2. **Managing rapid technological change:** Technology evolves quickly, and businesses must constantly update or replace their systems to stay competitive. Managing these changes without disrupting operations or overwhelming staff is difficult.

3. **Cybersecurity and risk management**: Protecting information assets from cyber threats requires ongoing vigilance, investment, and expertise. Failure to manage security risks can lead to data breaches, financial loss, and reputational damage.

4. **Data management and quality control:** Ensuring data accuracy, consistency, and availability is crucial for informed decision-making. Poor data management can result in incorrect insights and undermine trust in the system.

5. **User adoption and training:** Implementing new information systems often meets resistance from employees. Ensuring adequate training and encouraging adoption is necessary to realize the full benefits of technology investments.

6. **Budget constraints and cost control**: Balancing the costs of acquiring, implementing, and maintaining information systems with other business needs is a persistent challenge, especially for organizations with limited resources.

7. **Regulatory compliance and ethical considerations:** Businesses must comply with a growing number of laws related to data privacy, intellectual property, and digital transactions. Navigating these regulations while maintaining ethical standards adds complexity to system management.

**b)** As a systems project management expert, outline at least five important criteria that should be considered when selecting projects. Briefly Explain how these factors help determine the feasibility, value, and alignment of a project with organizational goals**.**

1. **Strategic alignment:** The project should support the organization's overall mission, vision, and strategic objectives. This ensures that resources are invested in initiatives that drive the business forward and reinforce key priorities.

2. **Cost and Budget availability:** Evaluating the estimated cost of the project against the available budget helps determine financial feasibility. Projects that exceed budget constraints or lack funding may not be viable.

3. **Return on Investment (ROI):** Assessing the expected financial benefits relative to the costs helps gauge the project's value. Projects with higher ROI are generally prioritized as they promise better returns for the organization.

4. **Risk assessment:** Understanding potential risks such as technical complexity, market uncertainty, or regulatory issues helps in evaluating whether the organization can manage and mitigate these risks effectively.

5. **Resource availability:** Determining if the necessary human, technical, and material resources are available ensures the project can be realistically executed without overextending the organization.

6. **Timeframe and deadlines:** Projects with timelines that align with business needs or market windows are more likely to deliver timely value. Projects that take too long may lose relevance or competitive advantage.

7. **Stakeholder support and impact:** Gauging the level of support from key stakeholders and the potential impact on customers, employees, and partners helps ensure the project will receive necessary backing and meet user needs.

**c)** You have been hired as an expert by Kamanzi's firm to help determine the business value of information systems. In this role, briefly explain at least five key ways in which information systems contribute value to the organization.

1. **Improved decision-making**: Information systems provide timely, accurate data and analytical tools that help managers make informed decisions, reducing uncertainty and enhancing strategic planning.

2. **Increased operational efficiency:** Automation of routine tasks and streamlined business processes reduce manual effort, lower operational costs, and improve productivity across departments.

3. **Enhanced customer service:** Information systems enable better tracking of customer preferences and faster response times, leading to improved customer satisfaction and loyalty.

4. **Competitive advantage:** By leveraging information systems for innovation, market analysis, and agile responses to market changes, firms can outperform competitors and capture new opportunities.

5. **Improved collaboration and communication:** Systems facilitate seamless information sharing and coordination among employees, departments, and external partners, fostering teamwork and faster project completion.

6. **Data Management and knowledge sharing:** Information systems store, organize, and disseminate valuable organizational knowledge, ensuring that critical information is accessible and reusable across the firm.

7. **Regulatory compliance and risk management:** Information systems help track compliance with laws and regulations, automate reporting, and manage risks, reducing the likelihood of legal issues and financial penalties.

## QUESTION SIX

**Marking guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 2 marks for each explained, Outline only is 1 mark | 6 |
| b) | 1 mark for each simply explained. Outline only is 0.5 mark | 6 |
| c) | 2 marks for each explained. Outline only is 1 mark | 8 |
| | **Total** | **20** |

## MODEL ANSWERS

**a)** Explain three key foundational factors to consider when establishing system development for a firm. Discuss how each factor contributes to the success and effectiveness of the system being implemented**.**

1. **Clear requirements definition:** Understanding and documenting what the system needs to accomplish is critical. Clear requirements ensure that developers build a system that meets the actual business needs, reducing costly changes later and increasing user satisfaction.

2. **Stakeholder involvement:** Engaging users, managers, and other stakeholders throughout development ensures the system aligns with business processes and expectations. Their feedback helps identify potential issues early and fosters ownership, improving adoption rates.

3. **Project planning and management:** Effective planning including setting timelines, budgets, and resource allocation helps keep the project on track. Good management minimizes risks, controls costs, and ensures timely delivery, all of which contribute to successful implementation.

4. **System scalability and flexibility:** Designing the system to accommodate future growth and changes enables the firm to adapt without major overhauls. Scalability ensures longevity and cost-effectiveness by allowing the system to evolve with the business.

5. **Quality assurance and testing:** Thorough testing at various stages detects defects and usability issues before deployment. This process improves system reliability, reduces downtime, and ensures the final product performs as intended.

**b)** Outline six major challenges that firms commonly encounter in relation to internet usage and briefly explain how these issues can impact business operations and overall performance.

**1. Cybersecurity Threats:** Firms are vulnerable to hacking, malware, phishing, and other cyberattacks, which can lead to data breaches, financial loss, and damage to reputation.

2. **Bandwidth and connectivity issues:** Slow or unreliable internet connections can disrupt business operations, reduce productivity, and negatively affect customer experiences, especially for online services.
3. **Data privacy concerns:** Handling sensitive customer and employee data online requires strict compliance with privacy laws. Violations can lead to legal penalties and loss of customer trust.

5. **Overdependence on internet infrastructure:** Heavy reliance on internet-based systems means that outages or disruptions can halt operations, causing delays and financial losses.

6. **Regulatory compliance challenges:** Different countries have varying internet regulations regarding content, data transfer, and commerce, complicating global operations and increasing compliance costs.

7. **Online fraud and identity theft:** The internet exposes firms to fraudulent transactions and identity theft, which can result in financial losses and reduced consumer confidence.

8. **Information overload:** The vast amount of data available online can overwhelm decision-makers, making it difficult to extract actionable insights and leading to poor decisions.

8. **Digital divide and access inequality:** Not all employees or customers may have equal access to reliable internet or digital tools, limiting participation and market reach.

**c)** Identify and explain at least four wireless technologies that you would recommend for a firm to adopt. Describe how each technology can support the organization's communication, connectivity, and operational efficiency**.**

1. **Wi-Fi (Wireless Fidelity):** Wi-Fi provides wireless internet access within offices and business premises, enabling employees to connect laptops, smartphones, and other devices seamlessly. It supports mobility, flexible work environments, and easy access to resources, enhancing productivity.

2. **Bluetooth**: Bluetooth enables short-range wireless communication between devices such as headsets, printers, and mobile devices. It facilitates quick file transfers, device pairing, and hands-free communication, improving workplace convenience and collaboration.

3. **4G/5G cellular networks:** These mobile network technologies provide high-speed internet access over wide areas, supporting remote work, mobile communication, and access to cloud services. 5G, with its faster speeds and low latency, further enhances real-time data exchange and IoT applications.

4. **Near Field Communication (NFC):** NFC allows secure, short-range data exchange between devices, commonly used for contactless payments and access control. It streamlines transactions and enhances security in physical and digital interactions.

5. **Wireless Sensor Networks (WSN):** WSNs consist of spatially distributed sensors that monitor physical or environmental conditions (e.g., temperature, humidity). They support automation, real-time monitoring, and data collection, improving operational efficiency in sectors like manufacturing and logistics.

6. **Satellite communication:** Satellite technology provides internet and communication connectivity in remote or rural areas where traditional infrastructure is unavailable. This ensures continuous communication and data access, supporting global operations and business continuity.

**QUESTION SEVEN**

**Marking guide**

| Sub question | Criteria | Marks |
|---|---|---|
| a) | 1 mark for each simply explained. outlined only is 0.5 mark | 5 |
| b) | 2 mark for each explained. Outline only is 1 mark | 10 |
| c) | 1 mark for each simply explained. outlined only is 0.5 mark | 5 |
| | **Total** | **20** |

**MODEL ANSWERS**

**a)** Identify and briefly describe five key components that make up a business intelligence system.

1. **Data sources:** These are the various origins of raw data, such as databases, spreadsheets, CRM systems, ERP systems, social media, and external data feeds, which provide the information needed for analysis.

2. **Data warehouse**: A centralized repository where data from multiple sources is cleaned, transformed, and stored in a structured format to support efficient querying and analysis.

3. **Data extraction**, Transformation, and Loading (ETL) Tools: These tools extract data from different sources, transform it into a consistent format, and load it into the data warehouse, ensuring data quality and integration.

4. **Data analytics and mining tools:** Software applications that analyse large datasets to identify patterns, trends, correlations, and insights that can inform business decisions.

5. **Online Analytical Processing (OLAP):** OLAP tools enable users to interactively explore and analyze multidimensional data from different perspectives, such as drilling down into details or aggregating summaries.

6. **Reporting and visualization tools**: These tools generate dashboards, charts, graphs, and reports that present complex data in an understandable and actionable format for stakeholders.

7. **User interface**: The front-end platform through which user's access BI functionalities such as querying data, generating reports, and visualizing insights typically designed for ease of use by business users.

**b)** Explain four different types of decision-making models commonly used by managers, highlighting how each model assists in guiding effective decision processes within organizations.

1. **Rational Decision-Making Model**: Description**:** This model follows a logical, step-by-step approach to problem-solving identifying the problem, generating alternatives, evaluating options, and choosing the best solution.

2. **Bounded Rationality Model:** Description**:** Proposed by Herbert Simon, this model acknowledges that managers face limitations in time, information, and cognitive capacity. As a result, they satisfice by choosing a solution that is good enough, rather than optimal.

3. **Intuitive Decision-Making Model**: Description**:** Decisions are made based on gut feelings, instincts, or past experience rather than systematic analysis.

4. **Creative Decision-Making Model:** Description**:** This model emphasizes innovation and the generation of novel solutions through brainstorming, lateral thinking, and experimentation.

5. **Recognition-Primed Decision Model**: Description**:** Combines intuition and experience, where the decision-maker quickly recognizes a situation as similar to one encountered before and applies a solution that previously worked.

6. **Collaborative or Participative Decision-Making Model**: Description**:** Involves multiple stakeholders or team members in the decision-making process through consultation or consensus-building.

**c)** List and provide a brief explanation of five key benefits that an Executive Support System (ESS) offers to an organization.

1. **Enhanced strategic decision-making**: ESS provides executives with high-level, summarized data and analytical tools that support long-term planning and strategic choices, enabling leaders to make informed and impactful decisions.

2. **Real-time access to critical information:** ESS aggregates and presents up-to-date performance metrics, market trends, and internal data in an easy-to-read format, allowing executives to monitor business health and respond quickly to changes.

3. **Improved efficiency and productivity**: By automating data collection and reporting, ESS reduces the time executives spend on manual tasks. This streamlines decision-making processes and frees up time for more value-added activities.

4. **Better problem identification and resolution**: With advanced data visualization tools and scenario analysis, ESS helps leaders detect emerging issues early and evaluate potential solutions before problems escalate.

5. **Facilitates competitive advantage**: ESS enables organizations to track industry trends, benchmark against competitors, and identify new market opportunities, helping to stay ahead in a competitive environment.

6. **Supports organizational alignment**: ESS helps ensure that all departments and teams are aligned with the organization's strategic goals by making high-level insights visible and accessible across leadership roles.

7. **Improved communication and collaboration:** By providing a centralized view of the organization's performance, ESS encourages more informed discussions, collaborative planning, and unified decision-making among executives and department heads.

**END OF MARKING GUIDE AND MODEL ANSWERS**