

國立中央大學 114 學年度碩士班考試入學試題

系所： 資訊管理暨大數據分析類

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科目： 管理資訊系統

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Single-choice Questions (2 points per question, total 100 points)

Please read the following scenario and answer questions 1 to 25.

In 2025, the Russia-Ukraine war has entered its third year, causing profound impacts on global economic and technological development. Country A, which heavily relies on international trade, imports and exports a wide range of products, including energy, high-tech equipment, and agricultural goods. However, due to the instability of international supply chains, extreme fluctuations in energy prices, and increasing cybersecurity threats, the country's economy faces significant challenges. To address these issues, the government of Country A has established the National Digital Emergency Response Center (NDERC) to coordinate crisis response strategies across enterprises and government institutions. NDERC's primary tasks include ensuring supply chain stability, strengthening national cybersecurity, and promoting ESG policies to enhance corporate sustainability. Meanwhile, leading enterprises in Country A are actively adopting hybrid cloud, IoT, big data analytics, and quantum technologies to mitigate operational risks amid such a highly uncertain environment. Currently, NDERC has begun deep cooperation with key enterprises in Country A to integrate smart warehousing, supply chain optimization systems, and quantum security technologies. However, this ambitious initiative faces significant technical challenges, such as how to integrate multi-source data, ensure data security and regulatory compliance, and maintain real-time system responsiveness.

1. During a supply chain disruption, NDERC needs to quickly integrate real-time data from multiple suppliers and adjust supply allocations accordingly. Which type of system architecture would be most suitable for this task?
 - (A) Distributed cloud systems
 - (B) Customer Relationship Management systems
 - (C) Traditional data warehouses
 - (D) Document management systems
 - (E) Edge computing systems

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2. A high-tech company in Country A intends to establish regional logistics hubs to reduce supply chain risks. Which tool is best suited for evaluating location options for these logistics hubs?
 - (A) Sensitivity analysis tools
 - (B) Geographic Information Systems
 - (C) Decision Support Systems
 - (D) ERP financial modules
 - (E) Predictive analytics tools
3. Due to the instability of international logistics, NDERC suggests enterprises enhance traceability in the food supply chain. Which technology would be the most effective for achieving this?
 - (A) ERP systems
 - (B) Big data analytics
 - (C) Blockchain technology
 - (D) CRM systems
 - (E) IoT-enabled tracking systems
4. A manufacturing company plans to introduce AI technology to optimize its inventory management. Which type of model should the company adopt to predict future demand based on historical sales data?
 - (A) Time series forecasting models
 - (B) K-means clustering models
 - (C) Reinforcement learning models
 - (D) Regression analysis models
 - (E) Neural network models
5. To meet NDERC's requirement for providing real-time carbon emission reports along the supply chain, which type of system functionality would be most suitable?
 - (A) DSS
 - (B) Supply Chain Management system
 - (C) CRM
 - (D) Executive Information System
 - (E) ESG data integration platforms

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6. NDERC needs to integrate energy usage data from various enterprises and analyze overall consumption trends in real-time. Which type of big data technology is best suited for this task?
- (A) Distributed computing frameworks
 - (B) Document processing systems
 - (C) Centralized databases
 - (D) Web crawling technologies
 - (E) Stream processing systems
7. When NDERC needs to evaluate the potential effects and risks of different emergency response strategies, which type of tool would be most appropriate?
- (A) OLAP tools
 - (B) Sensitivity analysis tools
 - (C) Natural language processing tools
 - (D) POS systems
 - (E) Decision support simulation tools
8. Companies in Country A have encountered repeated DDoS attacks after adopting hybrid cloud architectures. Which of the following measures would be most effective in mitigating the risk of DDoS attacks?
- (A) Deploying load balancing and traffic scrubbing systems
 - (B) Upgrading the ERP system
 - (C) Enhancing logistics management
 - (D) Improving the member management module
 - (E) Using AI-based threat detection systems
9. NDERC is considering quantum technology to enhance the security of confidential communications. Which of the following technologies is most appropriate for this purpose?
- (A) Quantum simulation
 - (B) Quantum Key Distribution
 - (C) Time series analysis
 - (D) Natural language processing
 - (E) Homomorphic encryption

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10. During its network security monitoring, NDERC discovers that some companies have data inconsistency issues. This issue is most likely caused by which of the following factors?
- (A) Insufficient data cleansing
 - (B) Poor customer management
 - (C) POS system failure
 - (D) Website design errors
 - (E) Incorrect data integration processes
11. NDERC suggests deploying IoT devices to enhance warehouse monitoring and management. Which cybersecurity mechanism should be prioritized to ensure the security of these devices?
- (A) Intrusion Detection Systems
 - (B) Document encryption tools
 - (C) Natural language processing tools
 - (D) K-means clustering algorithms
 - (E) Device authentication and encryption protocols
12. If banks in Country A adopt quantum encryption technology for financial transaction protection, which of the following risks would be significantly reduced?
- (A) Man-in-the-middle attacks and data tampering
 - (B) DDoS attacks
 - (C) Sales data anomalies
 - (D) Data redundancy issues
 - (E) Phishing attacks
13. NDERC plans to establish a national cybersecurity monitoring center. Which of the following would be the primary function of this center?
- (A) Providing cloud storage services for enterprises
 - (B) Monitoring and issuing early warnings of cyber threats
 - (C) Enhancing customer relationship management
 - (D) Supporting financial analysis
 - (E) Coordinating cross-border incident response

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14. NDERC encourages enterprises to participate in the ESG certification program, requiring all supply chain partners to submit annual carbon emission reports. The primary objective of this measure is to:
- (A) Increase product diversity
 - (B) Reduce energy costs
 - (C) Enhance supply chain transparency and sustainability
 - (D) Increase revenue
 - (E) Comply with international regulations
15. NDERC has identified that false information about the country's energy supply is spreading rapidly on social media. To counter this, which of the following strategies would be most effective?
- (A) Strengthening public communication and fact-checking mechanisms
 - (B) Increasing the production of promotional content
 - (C) Limiting access to international media platforms
 - (D) Encouraging enterprises to invest more in advertisements
 - (E) Collaborating with social media platforms to flag false content
16. To ensure the accuracy and transparency of ESG reports, NDERC suggests enterprises adopt which of the following technologies?
- (A) Blockchain technology
 - (B) Natural language processing
 - (C) Geographic Information Systems
 - (D) Document processing systems
 - (E) IoT-based environmental monitoring systems
17. NDERC plans to launch a national ESG evaluation platform. If the platform requires real-time integration of carbon emission and social impact data, which type of infrastructure would be most suitable?
- (A) Distributed big data processing platforms
 - (B) Centralized document management systems
 - (C) ERP financial modules
 - (D) CRM systems
 - (E) Cloud-native microservices architecture

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18. During a period of heightened tension, NDERC observes an increase in coordinated disinformation campaigns aimed at destabilizing the economy. Which type of technology would be most useful in detecting and analyzing these campaigns?
- (A) ERP systems
 - (B) Geographic Information Systems
 - (C) POS systems
 - (D) Natural Language Processing tools
 - (E) Social network analysis tools
19. NDERC collaborates with technology enterprises to develop quantum computing solutions for logistics optimization. Which type of problem is this most likely addressing?
- (A) Supply chain traceability issues
 - (B) Linear regression problems
 - (C) Customer segmentation problems
 - (D) Document management problems
 - (E) NP-hard problems
20. If NDERC adopts quantum computing for supply chain risk prediction, which of the following outcomes is most likely?
- (A) Significant improvement in prediction accuracy and speed
 - (B) Reduced dependency on suppliers
 - (C) Lower energy costs
 - (D) Increased product diversity
 - (E) Enhanced demand forecasting capabilities
21. If NDERC introduces Quantum Key Distribution into the national cybersecurity framework, it would offer the most effective protection against which type of attack?
- (A) Social engineering attacks
 - (B) Web defacement attacks
 - (C) Denial of Service attacks
 - (D) Cryptographic cracking and eavesdropping

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(E) Ransomware attacks

22. NDERC is working with international research institutes to introduce quantum sensing technology for national security enhancement. Which of the following is the primary application of quantum sensing technology?

- (A) High-precision earthquake monitoring and military detection
- (B) Customer behavior analysis
- (C) Financial data processing
- (D) Web content optimization
- (E) Supply chain performance monitoring

23. To utilize quantum computing resources without building its own quantum center, which strategy should enterprises in Country A adopt?

- (A) Use quantum cloud service platforms
- (B) Expand ERP system modules
- (C) Purchase high-performance traditional servers
- (D) Use CRM systems for analysis
- (E) Partner with academic research centers

24. NDERC and logistics companies in Country A collaborate on developing smart scheduling systems using quantum computing for complex transportation route optimization. The main advantage of this technology is:

- (A) Efficiently solving combinatorial optimization problems
- (B) Enhancing customer experience
- (C) Improving employee productivity
- (D) Reducing production costs
- (E) Enabling real-time route adjustments

25. NDERC explores the use of quantum simulation to solve complex problems in energy management. Which of the following scenarios is best suited for quantum simulation?

- (A) Modeling chemical reactions for renewable energy production
- (B) Real-time customer support
- (C) Financial transaction monitoring
- (D) Document processing automation

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(E) Predicting supply chain disruptions

26. Which of the following is not associated with generative AI?

(A) MediaTek DaVinci

(B) Harvard CS50.ai

(C) Stanford STORM

(D) OpenAI Triton

(E) Google Firebase

27. Who among the following are most likely to use asynchronous communication?

(A) members of a team who work in different time zones

(B) managers who work in the same office

(C) employees who work in an assembly line

(D) a group of directors who regularly meet for board meetings

(E) group members flying together on the same flight

28. Which of the following conditions exists when data are isolated in separated information systems?

(A) information overload

(B) encapsulation

(C) information silo

(D) data segregation

(E) data branching

29. Which of the following generative AI models are only considered closed-source foundation models?

I. Gemini Nano

II. GPT-4 Turbo

III. Claude-3 Sonnet

IV. Llama 3

V. Stable Diffusion

VI. PaLM 2

(A) I, II, III, VI

(B) II, III, IV, V

(C) I, II, III, IV

(D) III, IV, V, VI

(E) I, II, III, V

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30. Carter is the web designer for an open source project. He has created a program that facilitates the easy collation of data for a large-scale logistics firm. Which of the following is true of the source code for Carter's program?

- (A) It is less stable and platform dependent.
- (B) It is available to the public.
- (C) It is highly protected and obtained only by having a license.
- (D) It is available only to carefully vetted contractors.
- (E) It cannot be compiled.

31. Which of the following employees performs a primary activity, rather than a support activity, in Porter's value chain model?

- (A) Emily, who oversees supplier contract negotiations to ensure cost-effective procurement of raw materials.
- (B) Ryan, who is responsible for maintaining and upgrading the organization's IT infrastructure.
- (C) Lisa, who manages employee recruitment, training, and performance evaluations.
- (D) David, who provides after-sales technical support and services to customers.
- (E) Amanda, who handles the company's financial reporting and compliance activities.

32. Which of the following is an example of PaaS, a category of cloud hosting?

- (A) Microsoft Office 365
- (B) Microsoft Azure
- (C) iCloud
- (D) Amazon S3
- (E) Skype

33. When an area code changes the phone number for a given customer before the change will not match the customer's number afterward. This is an example of

- (A) missing values
- (B) inconsistent data
- (C) dirty data
- (D) data not integrated

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(E) septic data

34. Ads for Fiona's wedding photography business are displayed on several local websites for free. But if users click on them, she's charged \$0.25 per click. Which of the following revenue models is Fiona utilizing?

(A) pay-per-click model

(B) freemium model

(C) data model

(D) click-free model

(E) push-pull model

35. Which of the following best illustrates how generative AI is a disruptive technology?

(A) Generative AI improves the efficiency of existing software development processes.

(B) Generative AI automates repetitive tasks, such as data entry and customer service inquiries.

(C) Generative AI enables the creation of entirely new forms of art and media, potentially displacing traditional artists and content creators.

(D) Generative AI enhances existing medical imaging technology, leading to more accurate diagnoses.

(E) Generative AI helps personalize online shopping experiences, recommending products based on user preferences.

36. Which of the following is used for biometric authentication?

(A) smart cards

(B) facial features

(C) passwords

(D) personal identification numbers

(E) MD5 hashes

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37. Which of the following technologies cannot directly interact dynamically with external data sources or tools?
- (A) AI agent
 - (B) RAG (Retrieval-Augmented Generation)
 - (C) LangChain
 - (D) Fine-tuning
 - (E) API calls
38. Which of the following is considered as information rather than mere data?
- (A) a list of property prices in a neighborhood
 - (B) the return on investment of an advertising campaign
 - (C) the total number of students in a school
 - (D) the price of a company's shares on a given day
 - (E) the weight of a car
39. Which of the following statements is true of information systems?
- (A) Information systems include all business process activities.
 - (B) Every information system has at least one application.
 - (C) Information systems should be bought entirely off-the-shelf.
 - (D) Every business process should include at least one information system.
 - (E) Information systems should consist of only one application.
40. Which of the following is not a defining feature of generative AI?
- (A) Ability to generate new content such as text, images, or music
 - (B) Uses deep learning and neural network technologies
 - (C) Requires large amounts of training data
 - (D) Produces predetermined outputs without variation for each input
 - (E) Has the ability to understand context

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41. Which ethical concern should organizations prioritize when deploying generative AI systems in healthcare operations?

- (A) Ensuring data privacy and protecting sensitive patient information processed by AI models.
- (B) Reducing operational costs by automating repetitive tasks and minimizing human oversight.
- (C) Improving system performance by enhancing data storage and retrieval capabilities.
- (D) Standardizing AI-generated outputs to match predefined templates for consistency.
- (E) Increasing transparency by making all AI-generated decisions publicly accessible.

42. Which of the following best explains how prompt engineering primarily contributes to decision support systems (DSS)?

- (A) It automates the extraction and organization of relevant data from various sources, improving data accessibility for decision-makers.
- (B) It structures and refines the information provided to the AI, guiding it to generate insights specifically tailored for the decision-making task.
- (C) It develops interactive visualizations and dashboards that allow decision-makers to explore data and identify patterns more easily.
- (D) It creates rule-based systems that automatically recommend decisions based on pre-defined criteria and thresholds.
- (E) It monitors and analyzes decision outcomes, providing feedback to improve future decision-making processes and AI model accuracy.

43. Which of the following is not a factor in the high failure rate of reengineering systems projects?

- (A) Employees' concerns about change
- (B) Resistance by key managers
- (C) Changes in career paths signaled by the new system
- (D) Changes in job descriptions signaled by the new system
- (E) Failures of the new technologies to perform according to plan

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44. Which of the following is defined as the expertise of organizational members that has not been formally documented?

- (A) codified knowledge
- (B) information
- (C) data
- (D) experience
- (E) tacit knowledge

45. Which of the following best illustrates how multi-modality AI impacts multimedia information systems and human-computer interaction?

- (A) It enables AI to process and integrate multiple data types, such as text, images, and audio, creating context-aware responses that support natural and adaptive user interactions.
- (B) It facilitates the development of user interfaces that can seamlessly integrate and interpret various input modalities, such as voice, gestures, and images, for a more natural and intuitive user experience.
- (C) It improves the accuracy of multimedia data analysis by synthesizing insights from diverse inputs, supporting better content retrieval and classification.
- (D) It enhances multimedia database searches by enabling cross-modal queries, allowing users to combine text, image, and audio inputs to refine search results.
- (E) It standardizes multimedia content storage formats, ensuring compatibility across systems.

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46. A medical clinic uses a generative AI system trained in medical knowledge to assist doctors with preliminary diagnoses. One day, the AI system made an incorrect preliminary assessment of a patient's symptoms, leading to a delay in the correct diagnosis and treatment, which resulted in the patient's condition worsening and requiring hospitalization. Based on the concepts of responsibility, accountability, and liability, which of the following statements is most inappropriate?

- (A) This case highlights the need for new regulatory frameworks to address responsibility issues when AI systems are used in high-risk fields such as healthcare.
- (B) Using AI-assisted tools completely exempts doctors from professional judgment responsibility.
- (C) Developers of AI systems should bear a certain level of responsibility for the reliability and safety of the AI system.
- (D) Clinics should establish clear usage guidelines and risk management mechanisms when adopting AI systems.
- (E) This case reflects emerging challenges in defining liability in information systems.

47. A bank has reworked its mortgage application process so that several steps are handled by computer software, and some steps are combined to reduce bottlenecks in processing. The goal is to gradually improve its efficiency over time. This is an example of

- (A) automation.
- (B) rationalization of procedures.
- (C) paradigm shift.
- (D) TQM.
- (E) six sigma.

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48. Compared to traditional goods, digital goods have
- (A) low marginal costs of production.
 - (B) higher delivery costs.
 - (C) lower initial production costs.
 - (D) higher inventory costs.
 - (E) higher marginal costs.
49. Which of the following is not an example of a wearable computing device?
- (A) Smartwatch
 - (B) Smart glasses
 - (C) Smartphones
 - (D) Activity trackers
 - (E) Smart ID badges
50. Which process is used to protect transmitted data in a VPN?
- (A) Tunneling
 - (B) PPP
 - (C) VOIP
 - (D) Packet-switching
 - (E) Chaining