

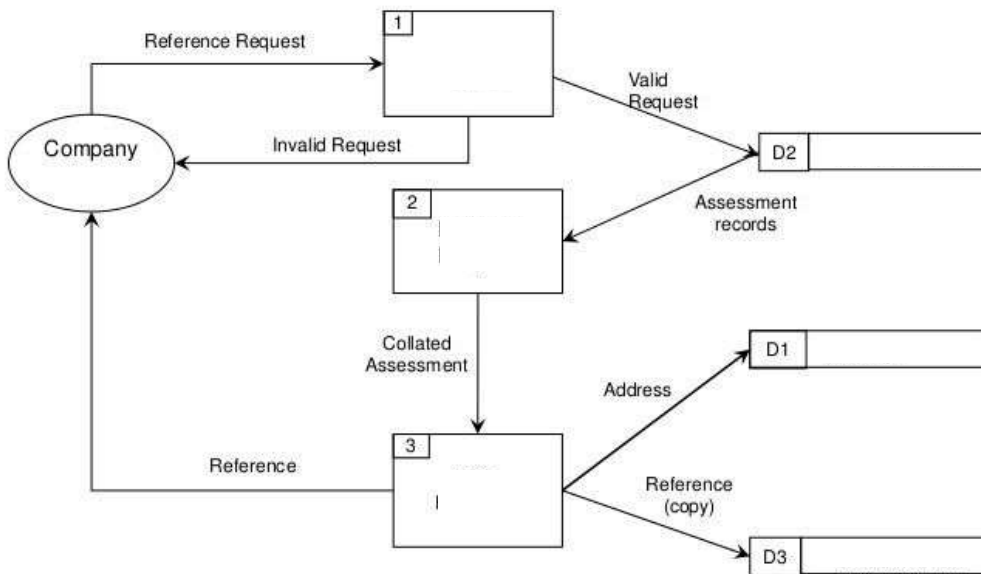
Information Systems Based Model Questions

Question 01

A company has implemented a system to manage reference requests. The system checks each request, processes it if valid, and writes a reference. If a request is invalid, the company is notified. The system also manages assessment files, address details, and reference file records.

The Level 1 Data Flow Diagram (DFD) for the system is shown below.

Level 1 DFD Example



(a) A numbered list of replacements for the labels (D1 to D3) and processes (1 to 3) is given below. Write down in the relevant box the number of the most suitable replacement for each of the labels and processes given in the DFD.

List: {Check Request, Process Request, Write Reference, Address, Assessment File, Reference File}

Label	Replacement
1	
2	
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D1	
D2	
D3	

(b) The system should ensure that only valid requests proceed for further processing.

Write down **one** functional requirement that the system should have to ensure validity checks for reference requests.

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(c) Identify **one** technical aspect that the company should check when conducting a feasibility study for implementing this system.

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(d) The **waterfall model** has been chosen for the development of this system. Why is a detailed requirement analysis crucial for this type of project?

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(e) Three developers are tasked with working on the modules: checking requests, processing requests, and writing references. Explain what "integration testing" means in the context of this system.

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(f) The company's IT department suggests deploying the system using a **direct deployment** method. Give one reason why a **parallel deployment** might not be suitable.

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(g) A member of the development team has suggested using COTS (Commercial-Off-The-Shelf) software instead of building a custom system. Provide one reason why the company might prefer custom development over COTS.

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Question 02

A group of A/Level ICT students at your school has developed a solution to improve the school's cafeteria management system. Their proposed system includes a mobile application for students to place meal orders and an integrated database to track inventory and sales. Once the system was ready, the students demonstrated it to the school administration and cafeteria staff. The solution requires a Wi-Fi connection throughout the school for real-time updates and transactions.

During the demonstration, the students discovered that the cafeteria already uses a basic system to handle inventory management, and the existing system is effective for the current needs but lacks a mobile ordering feature.

(a) Fill in the blanks in the following statements by selecting the most suitable items from the given list:

List: {preliminary investigation, technical feasibility, economic feasibility, operational feasibility, organizational feasibility, problem definition, system deployment }

1. The team of students could have known about the existing cafeteria system if they had not skipped the stage.
2. The school administration declined to accept the proposed solution due to the high cost of upgrading the school's infrastructure. This indicates that the solution developed by the students lacks
3. The cafeteria staff agrees to consider the new system only if it does not disrupt the current inventory management operations. This indicates that the solution lacks

(b) Write down **one** difference between **parallel deployment** and **phased deployment**.

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(c) Write down **one** advantage of using **Open-Source Software** for this project.

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Question 03

A team of A/Level ICT students at your school has developed a new Attendance Management System for the school. The system includes features like recording student attendance, generating attendance reports, and notifying parents about absences. The students conducted a thorough testing process to ensure the system works correctly before deployment.

The testing phases included unit testing, integration testing, system testing, and acceptance testing. Additionally, they used both black-box and white-box testing techniques to identify and fix errors.

(a) Fill in the blanks in the following statements using the most suitable terms from the list provided:
List: {unit testing, integration testing, system testing, acceptance testing, black-box testing, white-box testing}

1. Testing individual components of the Attendance Management System, such as the module for recording attendance, is known as
2. Checking how the attendance recording module interacts with the attendance report generation module is called
3. Ensuring that the entire Attendance Management System meets the school's requirements and works correctly as a whole is part of
4. A technique where the internal structure and code logic of the system are tested to ensure accuracy is called

(b) The students used **black-box testing** to test the attendance notification feature.
Explain what **black-box testing** is and give one reason why it is suitable for this scenario.

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(c) Before deploying the system, the school administration requested an **acceptance test**.
Describe the purpose of **acceptance testing** and why it is important.

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Question 04

The ICT students at your school have developed a custom Library Management System called **BasePok Software** for the school library. The system includes features for checking out books, managing inventory, and tracking overdue books. During the development process, the team analyzed both functional and non-functional requirements to ensure the system was effective and reliable.

The school principal, however, is considering using a **Commercial-Off-The-Shelf (COTS)** software solution instead of deploying the custom BasePok Software.

(a) Fill in the blanks in the following statements with either **functional requirement** or **non-functional requirement**:

1. The system must allow librarians to add, update, and remove book records. This is a
2. The system should respond to user queries within 2 seconds under normal load conditions. This is a
3. The system must notify users when a book is overdue. This is a
4. The system should be able to handle up to 500 concurrent users. This is a

(b) Describe what is meant by a **functional requirement** and give an example from the Library Management System.

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(c) The school principal is considering using **Commercial-Off-The-Shelf (COTS) software** instead of BasePok Software.

Give one advantage and one disadvantage of using COTS software for this situation.

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(d) Explain one reason why BasePok Software might be preferred over COTS software for the school library.

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MCQs Based on Information Systems

1. Choose the most suitable software development models for the following scenarios:

- **A:** A project where requirements are not well understood and may change over time.
- **B:** A project with a clear and well-defined set of requirements from the start.
- **C:** A project requiring a series of prototypes for client feedback.

- (1) A – waterfall, B – spiral, C – iterative
- (2) A – agile, B – waterfall, C – prototyping
- (3) A – iterative, B – agile, C – waterfall
- (4) A – prototyping, B – agile, C – waterfall
- (5) A – agile, B – iterative, C – spiral

2. Which of the following is a **non-functional requirement** for a hospital management system?

- (1) The system must allow doctors to access patient records.
- (2) The system must provide real-time updates on patient conditions.
- (3) The system must be available 24/7 to handle emergencies.
- (4) The system must allow nurses to schedule appointments.
- (5) The system must notify patients about their upcoming appointments.

3. During which type of testing are individual software modules combined and tested as a group to expose interface defects?

- (1) Unit testing
- (2) Integration testing
- (3) System testing
- (4) Acceptance testing
- (5) Black-box testing

4. Which of the following best describes a **functional requirement** for a university's online course registration system?

- (1) The system should be able to handle up to 1,000 concurrent users.
- (2) The system should allow students to register for courses before the deadline.
- (3) The system should have a user-friendly interface.
- (4) The system should be secure and protect student information.
- (5) The system should be compatible with all major browsers.

5. A company is evaluating the purchase of **Commercial-Off-The-Shelf (COTS) software** for its new financial management system. Which of the following **factors** should be prioritized to ensure the system meets organizational needs?

- **A:** Customization options to tailor features for specific financial processes
- **B:** Reliability and support from the software vendor
- **C:** The ability to integrate seamlessly with existing systems

- (1) A and B only
- (2) A and C only
- (3) B and C only
- (4) A only
- (5) All A, B, and C

6. Which of the following is a **non-functional requirement** for a banking system?

- (1) The system must allow customers to transfer money.
- (2) The system must provide customers with real-time account balance updates.
- (3) The system must be accessible to users 99.9% of the time.
- (4) The system must notify users when transactions are completed.
- (5) The system must allow account holders to view their transaction history.

7. A university uses software to manage student admissions. Which testing phase involves checking whether the software meets the admission department's requirements and expectations?

- (1) Unit testing
- (2) Integration testing
- (3) System testing
- (4) Acceptance testing
- (5) Black-box testing

8. During the development of an online shopping platform, the team tested the software by entering various input values to ensure proper functionality without considering the internal structure of the code. Which type of testing is this?

- (1) White-box testing
- (2) Unit testing
- (3) Black-box testing
- (4) Integration testing
- (5) Acceptance testing

9. Which of the following is an example of a **functional requirement** for a learning management system (LMS)?

- (1) The LMS must encrypt all user data for security purposes.
- (2) The LMS must support 1,000 simultaneous users.
- (3) The LMS must allow teachers to create and manage online quizzes.
- (4) The LMS should load within 3 seconds for optimal performance.
- (5) The LMS should be compatible with different web browsers.

10. Choose the correct deployment method for the following scenarios:

- **A:** A medical software system where patient data cannot be compromised.
- **B:** A social media app that gradually rolls out new features to a select group of users.
- **C:** An internal HR system for managing employee records.

- (1) A – parallel, B – phased, C – direct
- (2) A – direct, B – parallel, C – phased
- (3) A – parallel, B – pilot, C – phased
- (4) A – phased, B – direct, C – pilot
- (5) A – direct, B – phased, C – parallel

11. Which of the following best describes **system testing**?

- (1) Testing individual components of the software
- (2) Testing the complete system as a whole to ensure it meets requirements
- (3) Testing how different modules of the system interact with each other
- (4) Testing the software using various input and output conditions
- (5) Testing the system's source code and logic

12. A software development team needs to choose between building custom software and purchasing **COTS (Commercial-Off-The-Shelf) software**. Which of the following is a disadvantage of using COTS software? (1) It is generally cost-effective.
(2) It provides faster implementation.
(3) It may lack specific features required by the organization.
(4) It comes with vendor support.
(5) It is easy to integrate with all existing systems.

13. Which of the following statements about **white-box testing** is true?

- (1) It focuses on testing the software's user interface.
(2) It tests the internal logic and structure of the code.
(3) It does not require any knowledge of the code.
(4) It is typically performed by end-users.
(5) It is used only during system testing.

14. Which of the following is an example of a **non-functional requirement** for a messaging app?

- (1) The app must allow users to send and receive messages.
(2) The app must support group chats with up to 50 participants.
(3) The app should deliver messages within 2 seconds.
(4) The app should allow users to block other users.
(5) The app must enable voice and video calls.

15. A software project is using the **waterfall model**. At which stage is it most difficult to make changes to the system's requirements?

- (1) Requirement analysis
(2) Design
(3) Implementation
(4) Testing
(5) Maintenance

16. The **block size** of a disk is 8KB. A portion of its File Allocation Table (FAT) is shown below, indicating the blocks of a file named **report.docx**.

FAT	Value
300	302
301	300
302	303
303	-1
304	301

Notes:

1. The last block of a file is indicated by **-1**.
2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **report.docx** and the disk space allocated for the file, respectively?

- (1) 301, 16KB
(2) 300, 32KB
(3) 301, 24KB
(4) 302, 24KB
(5) 300, 16KB

17. The **block size** of a disk is 2KB. The following FAT is shown for a file named **data.csv**:

FAT	Value
120	121
121	123
122	-1
123	122
124	120

Notes:

1. The last block of a file is indicated by **-1**.
2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **data.csv** and the total disk space allocated for the file, respectively?

- (1) 120, 8KB
- (2) 124, 4KB
- (3) 120, 6KB
- (4) 122, 6KB
- (5) 124, 8KB

18. The **block size** of a disk is 1KB. The FAT shown below indicates the blocks allocated for **image.jpg**:

FAT	Value
500	502
501	-1
502	501
503	500
504	503

Notes:

1. The last block of a file is indicated by **-1**.
2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **image.jpg** and the total space allocated for the file, respectively?

- (1) 503, 3KB
- (2) 500, 2KB
- (3) 504, 4KB
- (4) 502, 2KB
- (5) 500, 3KB

19. The **block size** of a disk is 16KB. The FAT below indicates the blocks of **log.txt**:

FAT	Value
400	401
401	402
402	-1
403	400
404	403

Notes:

1. The last block of a file is indicated by **-1**.
2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **log.txt** and the disk space allocated for the file, respectively?

- (1) 403, 48KB
- (2) 400, 64KB
- (3) 400, 48KB
- (4) 404, 32KB
- (5) 403, 16KB

20. The **block size** of a disk is 10KB. The following FAT describes the blocks of **notes.doc**:

FAT	Value
700	701
701	702
702	703
703	-1
704	700

Notes:

1. The last block of a file is indicated by **-1**.
2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **notes.doc** and the total disk space allocated for the file, respectively?

- (1) 704, 40KB
- (2) 703, 20KB
- (3) 700, 40KB
- (4) 701, 30KB
- (5) 704, 10KB

21. The **block size** of a disk is 8KB. A portion of its File Allocation Table (FAT) is shown below, indicating the blocks allocated to the file **datafile.txt**.

FAT	Value
110	111
111	112
112	-1
113	110
114	113

Notes:

1. The last block of a file is indicated by **-1**.
2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **datafile.txt** and the total disk space allocated for the file, respectively?

- (1) 110, 24KB
- (2) 113, 16KB
- (3) 110, 16KB
- (4) 112, 8KB
- (5) 114, 8KB

22. The **block size** of a disk is 2KB. The FAT provided below indicates the blocks allocated to the file **notes.pdf**.

FAT	Value
205	-1
206	207
207	205
208	206
209	208

Notes:

- 1. The last block of a file is indicated by **-1**.
- 2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **notes.pdf** and the total disk space allocated for the file, respectively?

- (1) 206, 6KB
- (2) 205, 2KB
- (3) 208, 4KB
- (4) 209, 8KB
- (5) 208, 6KB

23. The **block size** of a disk is 4KB. The FAT for a file named **presentation.pptx** is shown below.

FAT	Value
300	302
301	300
302	-1
303	301
304	303

Notes:

- 1. The last block of a file is indicated by **-1**.
- 2. The **directory entry** of a file contains the block number of the first block of the file.

Which of the following gives the **directory entry** for **presentation.pptx** and the disk space allocated for the file, respectively?

- (1) 300, 8KB
- (2) 304, 16KB
- (3) 300, 12KB
- (4) 302, 4KB
- (5) 301, 8KB