Information Systems Based Model Questions – Answers

Answers:

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

Label	Replacement
1	Check Request
2	Process Request
3	Write Reference
D1	Address
D2	Assessment File
D3	Reference File

(b) The system should ensure that only valid requests proceed for further processing.
Answer: One functional requirement is:
The system should validate all reference requests by checking for completeness and correctness before forwarding them for further processing.

(c) Identify **one** technical aspect that the company should check when conducting a feasibility study for implementing this system.
Answer: One technical aspect to check is:
The compatibility of the new system with the existing infrastructure, including the database and network systems, to ensure smooth integration and operation.

(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?
Answer: A detailed requirement analysis is crucial because:
In the waterfall model, each phase depends on the outcome of the previous one. Accurate and complete requirement analysis ensures that subsequent design, implementation, and testing phases are efficient and minimize costly changes later.

(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.
Answer: Integration testing means:
Testing the combined modules (Check Request, Process Request, and Write Reference) to ensure they work together as intended and the data flows correctly between them without errors.

(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.
Answer: One reason why parallel deployment might not be suitable is:
Parallel deployment can be resource-intensive and complex because it requires maintaining and running

both the old and new systems simultaneously, which may not be feasible for a company with limited IT resources.

(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.
Answer: One reason for preferring custom development is:
COTS software may not fully meet the specific needs of the company's reference request system, whereas a custom-built system can be tailored to include all necessary features and workflow requirements.

Question 02 –

A group of A/Level ICT students at your school has developed a solution to improve the school's cafeteria management system.

Answers:

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

1. The team of students could have known about the existing cafeteria system if they had not skipped the **preliminary investigation** 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 **economic feasibility**.
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 **operational feasibility**.

(b) Write down **one** difference between **parallel deployment** and **phased deployment**.
Answer: *Parallel deployment involves running both the old and new systems simultaneously until the new system is fully accepted, while phased deployment involves gradually implementing the new system in stages, replacing parts of the old system step by step.*

(c) Write down **one** advantage of using **Open-Source Software** for this project.
Answer: *One advantage of using Open-Source Software is that it is cost-effective, as it can be freely accessed and modified to fit the specific needs of the project.*

Question 03 –

A team of A/Level ICT students at your school has developed a new Attendance Management System for the school.

Answers:

(a) Fill in the blanks in the following statements using the most suitable terms from the list provided:

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

(b) The students used **black-box testing** to test the attendance notification feature.
Answer: *Black-box testing is a technique where the functionality of a system is tested without looking at the internal code structure. It is suitable for this scenario because the focus is on ensuring that the attendance notification feature works as expected, regardless of how the code is implemented.*

(c) Before deploying the system, the school administration requested an **acceptance test**.
Answer: *Acceptance testing is conducted to determine if the system meets the specified requirements and is ready for deployment. It is important because it ensures that the system functions correctly in the real-world environment and meets the needs of the school administration and users.*

Question 04 –

The ICT students at your school have developed a custom Library Management System called **BasePok Software** for the school library.

Answers:

(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 **functional requirement**.
2. The system should respond to user queries within 2 seconds under normal load conditions. This is a **non-functional requirement**.
3. The system must notify users when a book is overdue. This is a **functional requirement**.
4. The system should be able to handle up to 500 concurrent users. This is a **non-functional requirement**.

(b) Describe what is meant by a **functional requirement** and give an example from the Library Management System.
Answer: *A functional requirement specifies what the system should do, such as specific tasks or functions it must perform. For example, in the Library Management System, a functional requirement is that the system must allow librarians to add, update, and remove book records.*

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

- **Advantage:** *COTS software is typically faster to implement and may come with reliable support and regular updates.*
- **Disadvantage:** *COTS software may not meet all the specific needs of the school library, limiting customization and flexibility.*

(d) Explain one reason why BasePok Software might be preferred over COTS software for the school library.
Answer: *BasePok Software might be preferred because it can be customized to include features that are specifically tailored to the needs of the school library, making it a better fit for their unique requirements.*

Answers - MCQs Based on Information Systems

1. **Correct Answer:** (2) A – agile, B – waterfall, C – prototyping
   Explanation: Agile is suited for projects with changing requirements, waterfall is ideal for well-defined projects, and prototyping is used when client feedback is needed frequently.
2. **Correct Answer:** (3) The system must be available 24/7 to handle emergencies.
   Explanation: Non-functional requirements relate to the performance, availability, or security of the system, rather than the specific features.
3. **Correct Answer:** (2) Integration testing
   Explanation: Integration testing ensures that combined modules work together and interact correctly.
4. **Correct Answer:** (2) The system should allow students to register for courses before the deadline.
   Explanation: A functional requirement specifies what the system should do, such as allowing students to register for courses.
5. **Correct Answer:** (3) B and C only
   Explanation: For COTS software, reliability and support, as well as integration with existing systems, are crucial. Customization is often limited in COTS solutions.
6. **Correct Answer:** (3) The system must be accessible to users 99.9% of the time.
   Explanation: Non-functional requirements specify the quality attributes of a system, such as availability and performance.
7. **Correct Answer:** (4) Acceptance testing
   Explanation: Acceptance testing is done to ensure that the system meets the user's requirements and is ready for deployment.
8. **Correct Answer:** (3) Black-box testing
   Explanation: Black-box testing focuses on testing the functionality of the software without knowledge of the internal code structure.
9. **Correct Answer:** (3) The LMS must allow teachers to create and manage online quizzes.
   Explanation: Functional requirements define specific behavior or functions of a system.
10. **Correct Answer:** (1) A – parallel, B – phased, C – direct
    Explanation: Parallel deployment is used in high-risk systems like medical software. Phased deployment gradually releases features, and direct deployment is suitable for internal systems like HR management.
11. **Correct Answer:** (2) Testing the complete system as a whole to ensure it meets requirements
    Explanation: System testing verifies the end-to-end functionality of the entire system.
12. **Correct Answer:** (3) It may lack specific features required by the organization.
    Explanation: COTS software may not be customizable to meet all specific needs of an organization.
13. **Correct Answer:** (2) It tests the internal logic and structure of the code.
    Explanation: White-box testing examines the internal workings of an application's code.
14. **Correct Answer:** (3) The app should deliver messages within 2 seconds.
    Explanation: Non-functional requirements define the performance or usability of a system rather than specific features.
15. **Correct Answer:** (5) Maintenance
    Explanation: In the waterfall model, changes are most difficult and costly to implement during the maintenance phase because the system is already fully developed and deployed.

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**.
Correct Answer: (2) 300, 32KB
Explanation: The directory entry for **report.docx** is 300, the first block. The block chain is 300 → 302 → 303 → -1, covering three blocks. Since each block is 8KB, the total disk space allocated is 3 × 8KB = 24KB.

17. The **block size** of a disk is 2KB. The following FAT is shown for a file named **data.csv**:
Correct Answer: (1) 120, 8KB
Explanation: The directory entry for **data.csv** is 120, the first block. The block chain is 120 → 121 → 123 → 122 → -1, covering four blocks. Since each block is 2KB, the total disk space allocated is 4 × 2KB = 8KB.

18. The **block size** of a disk is 1KB. The FAT shown below indicates the blocks allocated for **image.jpg**:
Correct Answer: (5) 500, 3KB
Explanation: The directory entry for **image.jpg** is 500, the first block. The block chain is 500 → 502 → 501 → -1, covering three blocks. Since each block is 1KB, the total disk space allocated is 3 × 1KB = 3KB.

19. The **block size** of a disk is 16KB. The FAT below indicates the blocks of **log.txt**:
Correct Answer: (3) 400, 48KB
Explanation: The directory entry for **log.txt** is 400, the first block. The block chain is 400 → 401 → 402 → -1, covering three blocks. Since each block is 16KB, the total disk space allocated is 3 × 16KB = 48KB.

20. The **block size** of a disk is 10KB. The following FAT describes the blocks of **notes.doc**:
Correct Answer: (3) 700, 40KB
Explanation: The directory entry for **notes.doc** is 700, the first block. The block chain is 700 → 701 → 702 → 703 → -1, covering four blocks. Since each block is 10KB, the total disk space allocated is 4 × 10KB = 40KB.

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**.
Correct Answer: (1) 110, 24KB
Explanation: The directory entry for **datafile.txt** is 110, the first block. The block chain is 110 → 111 → 112 → -1, covering three blocks. Since each block is 8KB, the total disk space allocated is 3 × 8KB = 24KB.

22. The **block size** of a disk is 2KB. The FAT provided below indicates the blocks allocated to the file **notes.pdf**.
Correct Answer: (4) 209, 8KB
Explanation: The directory entry for **notes.pdf** is 209, the first block. The block chain is 209 → 208 → 206 → 207 → 205 → -1, covering four blocks. Since each block is 2KB, the total disk space allocated is 4 × 2KB = 8KB.

23. The **block size** of a disk is 4KB. The FAT for a file named **presentation.pptx** is shown below.
Correct Answer: (3) 300, 12KB
Explanation: The directory entry for **presentation.pptx** is 300, the first block. The block chain is 300 → 302 → -1, covering three blocks. Since each block is 4KB, the total disk space allocated is 3 × 4KB = 12KB.