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# National University of Computer and Emerging Sciences, Lahore Campus

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**Instruction/Notes:**
1. **Points for each question are roughly related to the time that needs to be spent on that question. Avoid spending excessive time on questions with less points and less time on questions with more points.**
2. **Any kind of dishonesty will result in a minimum penalty of F in the exam.**

**MCQ1. One of the empirical studies found out that if an error in the requirement phase is not corrected, it could result in as much as _____ rework cost (if corrected at later stages of development). (1)**

A) 10 times
B) 50 times
C) 100 times
D) 200 times
E) 300 times

**MCQ2. Which of the following statements are true (1)**

i. Many requirements error are made
ii. Many of these errors are not detected early
iii. Many of these error are detected early
iv. Some of these error are detected early
v. Many of these errors can be detected early
vi. Many of these cannot be detected early
vii. Requirements error are usually not very common

A) i, iii, v
B) i, ii, iv, vi
C) ii, iv, v, vii
D) i, ii, iv, v
E) ii, iv, vi, vii

**MCQ3. Gold-plating refers to the practice of (1)**

A) Assigning correctly the highest priority to a requirement
B) Assigning incorrectly the highest priority to a requirement
C) Defining a useless requirement not desired by the customer in the hopes of impressing them
D) Taking a requirement and assigning it the highest importance



(2) 33

**MCQ4. Following are the features that most customers do not want. Identify the one which a small percentage would want. (1)**

A) Undesirable performance characteristics
B) Esthetic features ✓
C) Gold plating
D) Hazards

**MCQ5. Which is not one of the objectives of an interview. (1)**

A. Record ✓
B. Reassure
C. Discover ✗
D. Refine

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**Q1. Suppose a smart home system is to be designed. One of the stakeholders is an illiterate man from one of the villages of Pakistan. Write a short persona of such a person that could affect the development of the smart home system (5).**

'Person Name': Yaar Muhammad

'personal Information': Yaar Muhammad is a mid-aged hardworking farmer who is employed for a few days in a month at a house as a gardener to earn an extra mile. His family lives in the village while he visits the elite class house for making money. → 10

'Values': He is punctual on duty and spends 1-2 hours on the days he is working to garden the house. He is honest and trustworthy and sometimes the house owners leave the house to him while they are away for vacation. The house is multistoried so he has to have access to 2-3 floors of the house to garden the lawns or flower pots. (3)

Goals: 1) Yaar Muhammad needs sufficient access to the home to perform his daily routine tasks, probably access to every floor's terrace area. ✓

2) He should be able to check in and out of the house through biometric / RFID controls to access the required areas. ✓

3)



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* Req: User interface must allow either heating or cooling at one time.

(7)

**Q2. What is the relationship between a goal and a requirement? Explain with at least 2 examples (1+1+1=3)**

Goals are the objectives that are derived from the Mission statement and Goals help to derive Requirements.

1) For eg: Goal of a POS system is to accurately and effectively compute sales totals, after including taxes, rebates etc. and print receipt to the cashier. Req. can be: 1) System must generate a sales ID for multiple items purchased by the user.

2) Another goal: Goal of the air conditioning/heating system of a safe home is to automate the process of air cooling/heating through a user interface.

**Q3. Describe 10 different security requirements for a smart home monitoring system. (10 points)**

1. The system must be password protected and should allow access control levels to support the different users of the home. Eg: kids, elders, workers etc.
2. Access to the voice and video recordings of the persons moving inside the home must not be ~~stored~~ publicly available and securely on the cloud.
3. The Biometric / RFID devices ~~installed~~ must be installed at every entry point of the home to restrict anonymous user access to the home.
4. The Database of the Safe home System must be secure so as to disallow any hacker to intrude into the system and cause theft or robbery.
5. The system must have access levels defined for each inhabitant of the home and these levels must be configurable by an administrator.
6. The windows opening/closing systems must be secure to detect any anonymous user.
7. There must be security cameras installed in every room of the house configured in the SH interface.
8. ~~Security Alarm~~ System must have the provision to allow security alarms installed and operated by associating each alarm to a security camera.

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(11)

9. _____

10. _____

**Q4. Imagine a system such as FELX. Write one desired behavior, one specified behavior, one missing behavior and one unwanted behavior. (1+1+1+1=4)**

Desired: 1. Flex must display the student's information accurately at all times. ✓

Specified: 2. Flex will operate through wide area network for all students / teachers / other stakeholder to access at any time of the hour (24/7) ✓

Missing: 3. ~~Flex does not~~ provide a Reporting feature. ✓ (Stunted) (4)

Unwanted: 4. Flex must not display the person's (i.e, student's) psyological details such as weight, general health, height etc. ✓

**Q5. Imagine a system such as FELX. Write two forbidden behaviors. (2)**

1. Flex shall not display any personal or academic details of a student other than the one logged in. ✓

2. Flex shall not have a downtime of more than 5 minutes. ✓

(2)

**Q6. Should a requirements engineer make assumptions? Explain your answer with an example. (2)** (2)

No, he/she must not make any assumptions while documenting requirements. For instance, it might be



(8)

assumed that the system is required to be used on multiple hardware devices (such as smartphones and tablets) in addition to laptops and desktops. This will add to additional costs at the development end if not properly documented.

**Q7. In CMMI Level 2, how does having cost and schedule planning processes affect the overall development process? (2)**

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Schedule planning helps in determining the resource and cost requirements and this will be an input for determining the total effort estimates of the development process. A good Schedule will have better effort and cost estimates and will help the development to be completed on time and budget.

**Q8. Describe briefly the four major requirements engineering activities. (1+1+1+1=4)**

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1. Requirements Elicitation, which involves the discovery of Requirements through different elicitation techniques.
2. Requirements Analysis & Negotiation : in which the reqs. are analysized after elicitation phase and negotiated with the client on conflicting requirements, incomplete and inconsistent
3. Requirements Documentation : involves documenting the agreed upon requirements.
4. Requirements Validation : includes validating whether the requirements will correctly work in the intended user environment.

**Q9. Why do we need to analyze a current system that is going to be replaced with a new one which we are being tasked to build? (4)**

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1. In order to identify the problems faced by using the existing system, its necessary to perform analysis. other reasons include : ~~2) Upgradation to a latest technology~~



9.5

2. Upgrading the system to a latest technology to meet the market needs ✓

3. To improve the performance of the existing systems which might not be possible within the current jurisdiction of the architecture. ✓

4. To make the system more scalable, so it can be used for large amounts of data and have interoperability requirements to be implemented in it. ✓

**DO NOT WRITE BEYOND THIS POINT**