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057 _____

Registration Number: SP19-BSE-



COMSATS University, Islamabad
Department of Computer Science
FINAL TERM EXAMINATION - SPRING 2021

Class: BSSE-5 (A, B)

Date: July 03, 2021

Subject: Software Requirements Engineering

Instructor: Mr. Atique Ahmad Zafar

Total Time Allowed: 3 hours

Max Marks: 50

Case Study:

The Department of computer science usually faces students' course registration delay problem at the start of every semester. The registration process often delays due to its unstructured nature which further affects section management process. There are two categories of the students in terms of course registration i.e. regular and non-regular students. Regular students download their courses registration form from online student portal and after filling it (by mentioning courses choices) they are required to submit signed hard copy of it to the department. The observed reasons behind the delay include:

- Due to the failure or low grades in upcoming courses prerequisite, some students are required to repeat the prerequisite.
- Whenever any section exceeds to students' limit of 50, students are forced to swap the sections.

On the other hand non-regular students, simply go to the front office and manually tell their subjects choices to register and then according to the timetable of offered courses they are asked to fill the form and submit it.

To overcome this problem department need a well-structured automated solution which facilitate not only regular and non-regular students in course registration as well as the administration in section management.

Q. No. 1: (Mapped with CLO-2)

(5 Marks)

Identify the suitable elicitation technique(s) (with rationale behind the selection) which can be helpful in order to explore user requirements for above problem.

Elicitation Technique	Rationale
Brainstorming	Worked out brainstorming gives some imaginative ideas about the given scenario. It will help us think about different ideas and techniques in order to explore the user requirements.
Interview	The business analyst who is a part of the requirement elicitation team for the project is the interview. The staff department who are using the portal can be interviewed so as to identify their problems they faced and what they need for a better academic process. Department staff can process the registration form and approve online avoiding paperwork.

Q. No. 2: (Mapped with CLO-3)

(10 Marks)

Write a detail use case for course registration process (which help to structure the course registration process and elaborate functional requirements.

Use Case ID:	UC-1.1
Use Case Name:	Course Registration
Actors:	Primary actors: 1.Student Secondary Actors: 1.Admin
Description:	The students shall login to their portals and register their respective courses for the new semester and we get their respective sections allotted.
Trigger:	User selects the course registration option on the dashboard page after logging into their portal.
Preconditions:	1. The user must have a registered account on the student portal.
Postconditions:	1. The student registers hi courses for the new semester. 2. A section shall be allotted to the student.
Normal Flow:	<ol style="list-style-type: none"> 1. Student shall log in to their respective portal. 2. Student selects the course registration option. 3. Student will download the course registration form. 4. Student will fill the course registration form. 5. Student will print the form. 6. Student will submit the form to the department. 7. Student's courses shall be registered and a section shall be allotted to the student.
Alternative Flows:	<p>Alternative Flow 1: In step 2 of the normal flow if the student is not a regular student then:</p> <ol style="list-style-type: none"> 1. The system shall display a message to the student that the student should go to the front office and register their courses manually. 2. The student shall o to the front office and register their respective courses manually. <p>Alternative Flow 2: In step 6 if the student has filed the form incorrectly due to failing courses or having low grades then:</p> <ol style="list-style-type: none"> 1. The user shall download the course registration form again and fill it correctly. 2. The process shall continue from step 5 from normal flow. <p>Alternative Flow 3: In step 7 if the section which is allotted to the student has already 50 students in it then the system shall allot the student a new section.</p>
Exceptions:	None.

Q. No. 3: (Mapped with CLO-3)

(5 Marks)

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Analyze all possible business rules that can be applied on above business process.

BR ID	BR Description
BR-1	The prerequisite of a course should be cleared to be eligible for that course.
BR-2	A maximum of 50 students are allowed in a section.
BR-3	All the new applying students will be transferred to the new sections if the section has already 50 students.
BR-4	To be eligible for a course the prerequisite of that course should be cleared with atleast 2.0 gpa.
BR-5	The student shall repeat a course if the student has low grade or has failed that course.

Q. No. 4: (Mapped with CLO-4)

(10 Marks)

Derive functional requirements from course registration use case.

Req. Title	Req. Description
CourseRegister.login	The system shall let the student login to their portal.
CourseRegister.Dashboard	The system shall let the student access their dashboard.
CourseRegister.RegisterCourse	The system shall let the student register courses.
CourseRegister.DownloadForm	The system shall let the student download their course registration forms
CourseRegister.FillForm	The system shall let the student fill their respective forms.
CourseRegister.PrintForm	The system shall let the student print their forms.
CourseRegister.SubmitForm	Department shall accept those form which are correctly filled.
CourseRegister.CourseRegistered	The system shall Register the courses that are cleared.
CourseRegister.AllotSection	The system shall allot a section to the student.

Q. No. 5: (Mapped with CLO-4)

(5 Marks)

Classify the following requirements from a library system as stable or volatile requirements

#	Requirement detail	Stable/Volatile
Req. 1	The Cafeteria Ordering System shall operate with the following Web browsers: Microsoft Internet Explorer, Netscape Communicator, and Netscape.	Volatile
Req. 2	The system shall let a Patron who is logged in to the Cafeteria Ordering System place an order for one or more meals.	Stable
Req. 3	The Patron shall specify whether the order is to be picked up or delivered.	Stable
Req. 4	The Cafeteria Ordering System shall send an e-mail message to the Patron to confirm acceptance of an order, price, and delivery instructions.	Volatile
Req: 5	The system shall accommodate 400 users during the peak usage time window of 8:00 A.M. to 10:00 A.M. local time, with an estimated average session duration of 8 minutes.	Volatile

Q. No. 6: (Mapped with CLO-4)

(2+3 Marks)

Explain how the following non-functional requirements may conflict; illustrate your answers with examples.

i. Security vs. Performance

There can arise some situations in which the developer has to choose between the security and the performance of the system. The developer will choose security over performance because in applications the data integrity is most important in such a system.

Example:

Assume a situation in which a developer is working for a database of NADRA. In this case the developer will choose security because the data is very important and cannot be allowed to be leaked in any situation but speed can be compromised.

ii. Suggest how the following requirements might be rewritten in a quantitative way. You may use any metrics you like to express the requirements

#	Requirement detail	Rewrite Quantitatively
Req. 1	<i>The library system shall be easy-to-use</i>	It should be possible to train end users of the system to use all facilities.
Req. 2	<i>The library system shall provide reliable service to all classes of user.</i>	The rate of occurrence of failures in the retrieval facilities of the system shall be less than 1 for 500 queries.
Req. 3	<i>The library system shall provide a rapid response to all user requests for book information.</i>	The average response time of the system for user requests shall not be more than 5 seconds.

Q. No. 7: (Mapped with CLO-4)

(5 Marks)

Review the given requirements using the checklist and discover possible problems with them. The following requirements are for a library system which is an interactive system providing access to a large document database and which allows the automated ordering and electronic delivery of documents to local and remote end-users. Some requirements for this system are:

- Req. 1 The user interface shall be html. Users shall access the system via standard web browsers such as Netscape and Internet Explorer.
- Req. 2 The system shall primarily an end-user system. Users shall use the system within the constraints of the permissions assigned by the administrator to identify, locate, order and receive documents.

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- Req. 3 Users shall communicate with the system mainly via the html interface.
Req. 4 User shall provide input to the system via the html interface.
Req. 5 The system shall give output to the user via the html interface, email and print. The print output shall mainly be documents.

Problem type	Identified problem
Req1: Redundancy	Requirement 1 and requirement 3 says the same thing.
Req2: Conflict, Understandability	Requirement 1 states the system via standard web browsers and requirement 4 tells that the communication is through html.
Completeness	The 5 th requirement states that the output will mainly be documents, what else might be printed?
Completeness	What versions of html and web browsers aer assumed in requirement 1 and 3

Q. No. 8: (Mapped with CLO-5)

(5 Marks)

What is the format of user story and explain it through example.

Format:

As a < type of user >

I want < some goal >

so that < some reason >.

User story card example:

“As a user, I want to be able to cancel my reservation at anytime so that I do not lose all the money if an incident occurs.”