



**Sir Syed University of Engineering & Technology**  
**Faculty of Computing & Applied Sciences**  
**Department of Software Engineering**

**Online End Semester Examinations (Spring 2021)**

|   |   |                     |                            |                           |
|---|---|---------------------|----------------------------|---------------------------|
| Course Code with Title  | SWE-106: Introduction to Software Engineering |                     | Program                    | BS (Software Engineering) |
| Instructor  | Ali Yousuf Khan, Sarfraz Natha                |                     | Semester                   | 2 <sup>nd</sup>           |
| Start date & Time   | June 12, 2021<br>at 08:30 AM                  | Submission Deadline | June 12, 2021<br>at 1:30PM |                           |
| Maximum Marks   | 50  |                     |                            |                           |
| Students must meet their submission deadline as there is no re-take or re-attempt after the deadline. |   |                     |                            |                           |

**IMPORTANT INSTRUCTIONS:**

**Read the following Instructions carefully:**

- Attempt All Questions on MS-Word. Font theme and size must be Times New Roman and 12 points respectively. Use line spacing 1.5.
- You may provide answers HANDWRITTEN. The scanned solution must be submitted in PDF file format (Use any suitable Mobile Application for Scanning)
- For Diagrams, you can use paper and share a clear visible snapshot in the same Answer Sheet.
- Arrange questions and their subsequent parts in sequence.
- Make sure that your answers are not plagiarized or copied from any other sources. In case of plagiarism, **ZERO** marks will be awarded.
- Provide relevant, original and conceptual answers, as this exam aims to test your ability to examine, explain, modify or develop concepts discussed during the course.
- Recheck your answer before the submission on **VLE** to correct any content or language related errors.
- You must upload your answers via the VLE platform **ONLY**.

**You must follow general guideline for students before online examination and during online examination which had already shared by email and WhatsApp.**

**This paper has a total of 08 pages including this title page**



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**Q.1. (20)**

**Justify the following with suitable reasons:**

- a. The software development process can be represented by the generic frame work task sets. The software process development and task set activities are also important and may be adopted for a smooth execution and analysis during software execution. Designate the limitations and expansions if any of these activities during process execution or development. The **even roll numbers** will **justify** the situation for **limitations** of activities and the **odd roll numbers** will **justify** the situation for **expansions** of activities. **(05 Marks)**
- b. Illustrate any **four** example professional **categories related queries with answers** related to a software's quality dimensions characteristics you would ask as a member of the quality management team with the candidate who has applied for the post of software quality control engineer to determine whether or not the software is fit for its intended purposes. The **even roll numbers** will **write the categories with answers** as a **software expert** and the **odd roll numbers** will **write categories with answers** as a **software quality control engineer**. Give your **real name** and **roll number** in **reverse order** at the **beginning of your answer** in **both situations**. **(05 Marks)**
- c. A software product is more effectively tested if it is built with testability as a consideration. Many software testing strategies are available like unit testing, basis path testing, top-down integration etc. State the characteristics of a software testing strategy that will improve its reliability in terms of regression testing and smoke testing. If **(your roll no.) mod 4=0** then **justify** your answer for **object-oriented testing justifications**. If **(your roll no.) mod 4=1** then **justify** your answer for **top-down integration testing justifications**. If **(your roll no.) mod 4=2** then **justify** your answer for **bottom-up testing justifications**. If **(your roll**



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no.) mod 4=3 then **justify** your answer for **white box and black box testing justifications**. **(05 Marks)**

**Note:**

**Suppose your roll number is 10 and you want to calculate mod 4 ( Show this calculation at starting of each question wherever if applicable / necessary )**

- 1. Integer division (result without fractional part) of dividend by modulus:**  
 $10 / 4 = 2$
  - 2. Multiplication of the result right above by the divisor:**  
 $2 \times 4 = 8$
  - 3. Subtraction of the result right above from the dividend:**  
 $10 - 8 = 2$  **(Answer).**
- d. Software agile development is a process that values customer collaboration over contract agreement. Several agile techniques are available like scrum, crystal, dynamic development, extreme programming and industrial programming that a customer can implement and set out the operations. But if you are a software engineer or software quality assurance manager or software programmer or software developer then illustrate the agile technique adopted during software development. Also define the management risks where applicable. If (your roll no.) mod 4=0 then recognize and define the case of software scrum developer. If (your roll no.) mod 4=1 then recognize and define the case of software agile developer manager. If (your roll no.) mod 4=2 then recognize and define the case of software technical manager. If (your roll no.) mod 4=3 then recognize and define the case of software developer. **(05 Marks)****



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**Q.2. (10)**

a. Calculate Function Point and Lines of Code based estimation related tasks for your selected project with the following details: **( 06 Marks )**

**Write your original CNIC / B-FORM at the beginning**

**Take your CNIC / B-FORM # last five digits as the estimated LOC or FP**

**Take your CNIC / B-FORM # first six digits as the average productivity**

The labor rate is 60,000 \$ for both systems. Show complete calculations.

b. Compute the risk exposure of one of the critical risk item related to scheduled risk component described as: **( 04 Marks )**

Only 50% of reusable software components will in fact be integrated into your project code from the total of 8000 initially planned components. Since the average components is 100 LOC but professional's recommendation is 250 LOC and the cost of developing each component is the **2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and the 5<sup>th</sup> digit** of your original **CNIC / B-FORM** in **Saudi Riyal**. The probability of the risk occurrence is the last two digit of your original **CNIC / B-FORM** in **percentage (%)**. Mention your original **CNIC / B-FORM number** at the beginning and **complete calculations**.

**Q.3. (10)**

Develop a complete **class diagram** and **use case diagram** scenarios for the following situation in your own words:

In the modern era people know that the ATM or the automated teller machine is a technological mechanism that provides access to activities like balance checking, depositing, account statement, interbank funds transfers, bills payments and much more for any **Ordinary Banking System** or **Takaful Banking System**. If the ATM machine is of any other bank, then the client or the customer will have to pay some extra maintenance charges while making any sort of transaction. The ATM technical support department team will provide the maintenance to the ATM machines



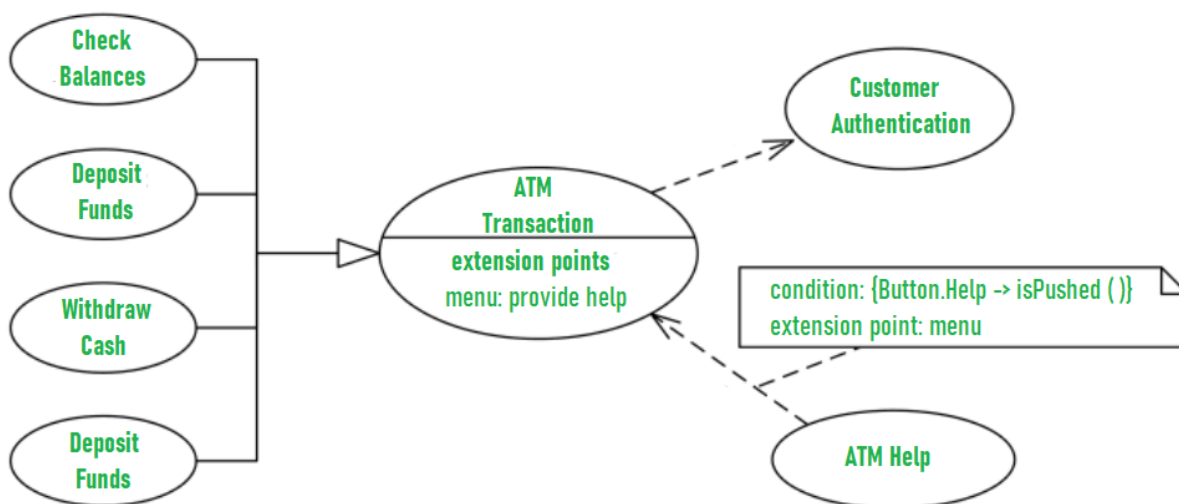
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systems or any issue related to the customer. It should be kept in mind that there will be an experienced information technology specialist at the back whose job is to monitor all these proceedings.

Use your original **CNIC** or **B-FORM** number in **reverse order** and relate it with the **credit card** or **ATM card number**. The transaction receipt received after any transaction should have **your home** or **apartment number** for reference in future. For **any other ATM machine** system use your **original complete roll number in reverse order** as the ATM card number and the transaction receipt.

The designated solution from the IT authorities is the **option a** for Takaful Banking System and **option b** for Ordinary Banking System as below. But both the solutions are not fulfilling all the needs. Mention those objects or attributes and infer the demands applicable and must be implemented for your system as mentioned above by redraw the case as required with suitable short reasonings. The **odd roll numbers** must develop the **class diagram** and **use case diagram** for **Takaful Banking System** and the **even roll numbers** must develop the **class diagram** and **use case diagram** for **Ordinary Banking System**.

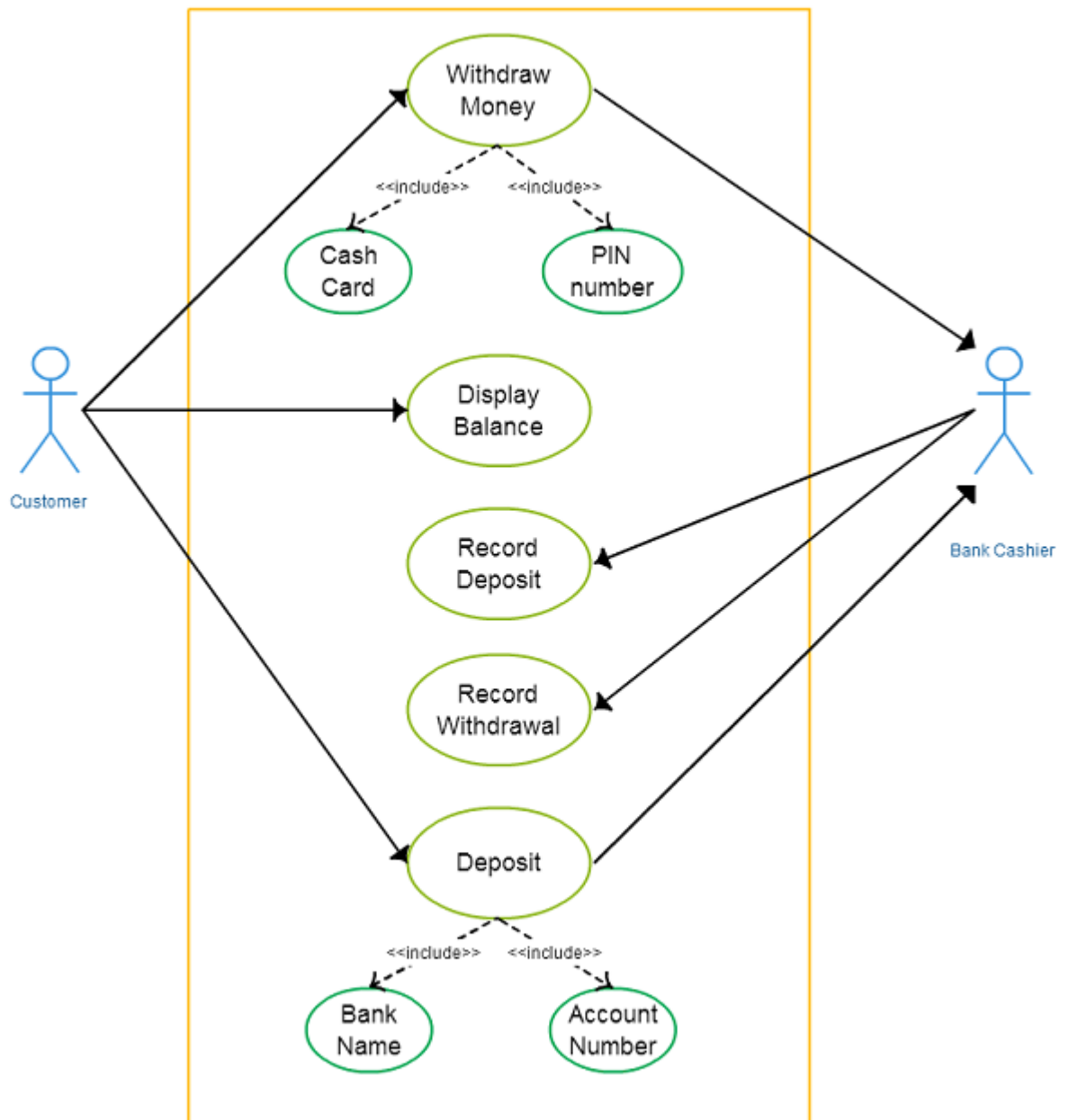
**a. Proposed Solution for Takaful Banking System**





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**b. Proposed Solution for Ordinary Banking System**



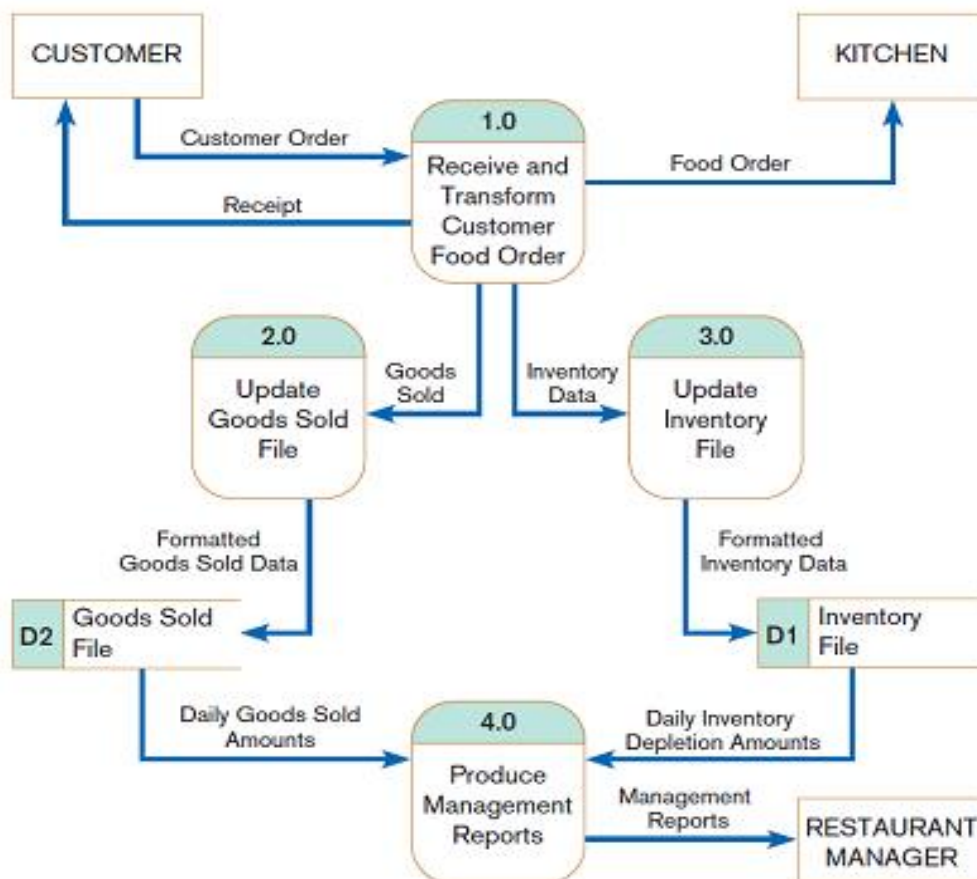


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**Q.4.**

**(10)**

Summarize the content object or navigation semantic unit structure diagram as required with suitable content for the following demanded website layout structure of XYZ Restaurant Chain Company at each phase. Estimate and predict the irrelevant or optional contents that can be implemented in future as per requirement:







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**Situation:** The food delivery system allows the consumer of a web browser to order food for delivery. To place an order a client searches to find items to order add items and possibly searches again for more items. When all items have been selected the client will provide a delivery address. If the client is not paying in cash, then the client will provide credit card information and the system has an option for client to register with the food chain company. In this way the client can then save their name and address information so the client does not need to enter the information again when placing an order. If **(your roll no.) mod 4=0** then **infer and estimate** the case of **irrelevant** content objects in content object structure diagram. If **(your roll no.) mod 4=1** then **infer and estimate** the case of **optional** content objects in navigation semantic unit diagram. If **(your roll no.) mod 4=2** then **distinguish** the navigation semantic unit diagram and content object structure diagram with **drawbacks**. If **(your roll no.) mod 4=3** then **distinguish** the navigation semantic unit diagram and content object structure diagram with **enhancements** for future.

**BEST OF LUCK!**