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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION**

**(ONLINE / TAKE HOME / OTHER SUMMATIVE**

**ASSESSMENT)**

**SEMESTER II**

**SESSION 2019/2020**

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| COURSE NAME | : | SOFTWARE ENGINEERING |
| COURSE CODE | : | BIT 10103 |
| PROGRAMME | : | BIT |
| EXAMINATION DATE | : | JULY 2020 |
| DURATION | : | 3 HOURS |
| INSTRUCTION | : | 1. ANSWER **ALL** QUESTIONS. 2. THE STUDENTS SHOULD UPLOAD THE ANSWER BOOKLET (PDF/ WORD FORMAT) WITHIN 30 MINUTES AFTER EXAMINATION PERIOD. |

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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| **Q1** | (a)  (b) | Based on **Figure Q1**, answer the following questions.  PC festival is a famous PC festival, held in Johor Baharu every year. Since its ﬁrst edition, it has gone through several major changes regarding its theme, duration and location. From this year on, the tickets will be sold in three distinct ways: (a) traditionally which will be sell by the two events agencies, (b) in electronic format directly from the festival website, and (c) through bus ticket. In order to avoid double selling, all parties will have access to the same unique tickets database of the new system. A partnership with the ticketing company needs to be set up so they can sell combi-tickets including both the festival admission fee and the bus ride to the festival venue at reduced price, from anywhere in Johor Baharu. Since tickets will also be sold online, ABC\_Payment Inc. will be contracted to provide and ensure the security of the online payment service. Additionally, upon arrival at the festival venue, each participant has to self-check in at a touch screen terminal, which scans the barcodes on his/her ticket and issues a name tag with an electronic chip. The company will deploy XYZ Inc to provide the name tag where it can be used to load money, such that whenever she/he wants to purchase snacks or goodies, she/he does not have to use cash any more, thus reducing waiting times. The organizers decided to hire you as system analyst to propose a new system within 3 months that completely modernize the tickets selling system.    **FIGURE Q1**  Apply an appropriate software development model for the new system in **Figure Q1**.  (6 marks)  An appropriate software development model for the system is Prototype software development because client can involve themselves when the system is being develop. Client can get a better understanding of the requirement of the system since they give their recommendation to improve the system further. Prototyping also suitable for a complicated and large system for there are no manual process or any existing system in order to help the development of the system.  Outline **THREE (3)** reasons of your answer in **Q1(a).**  (6 marks)  3 reasons are:   1. This model allows client involvement during the development. During the development client can give their recommendation in order to meet their requirement and also to help them better understanding the requirement. 2. It is also easy to detect errors during the development. This is because during the development client actively involve in the process and during the process of the system developer can detect it much easier. 3. Developer can refine the software and add a new feature after finished the prototype. This model allow developer to give a better finishing touch and modify the requirement. |
|  | (c) | Prepare **FOUR (4)** methods to gather further requirements that can help to build the new system.  (8 marks)  4 methods to gather further requirement are:   1. Brainstorming allow gathering idea as many possible without correcting anyone from a group of people in order to find a further requirement for the new system. 2. Questionnaire and survey allow developer to collect information from various people especially those who use the new system. 3. Observation allows system analyst to identify flaw, how old system work and new opportunities for the system requirement in order to add it to new system. 4. Prototyping allowing developer to add new requirement for the new system as per client request. |
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| **Q2** |  | Draw the context diagram based on the scenario in **Figure Q2**.  A prospective member fills in an application form. Then the librarian processes the application form and issues a library card member. The new member then browses the catalogue and finds a loan item (books, magazines, videos, DVDs and cassettes). The new member then borrows the loan item by giving his/her library card plus the loan items to the librarian. The librarian records the borrowings and returns the library card and loan items to the borrower. At some future date, the borrower returns the loan items to the library. The librarian checks in the items. The member may also reserves a loan item or arrange an interlibrary loan from another library. When these items become available at the library, the requesting member is notified. The librarian maintains the catalogue by getting a list of the latest items from book suppliers every month. At the end of each month the librarian creates an order for the book suppliers. When the items arrive the librarian labels them and makes them available in the catalogues.    (20 marks)  **FIGURE Q2** |
| **Q3** | (a) | Outline **TWO (2)** important reasons of software testing for a software in a life support machine.  (4 marks)  2 important reasons are:   1. Software testing for life support machine is important because it is to prove the quality of the product. Software testing make sure the machine work according it’s purpose to support someone’s life without any error. 2. Software testing for life support machine also saves money. Errors or bugs that are caught earlier can save money because if the errors or bugs are caught when the machine is used for the patient it can cost a lot of money. |
|  | (b)  (c) | Outline **TWO (2)** challenges of software testing.  (4 marks)  2 challenges of software testing are:   1. Lack of skilled testers. Unskilled tester adds more errors than fixing the problems and will prolonged the process. 2. Not enough time to test the software. This is because tester have a lot tasks to do within a specified time which is writing, executing and reviewing the tests.   Differentiate between validation and verification.  (4 marks)  Difference between validation and verification are:  Validation is referring to a different set task ensure that the software that has been built is traceable to customer requirement.  Verification is referring to the set of tasks that ensure software correctly implement a specific function. |
|  | (d) | Differentiate **TWO (2)** between black box testing and white-box testing.  (8 marks)  Difference between black box testing and white box testing are:  Black box testing   1. In this test, tester has a set of input values and a desired result. When provide the input, if the output matches with the desired results the result of the test are good and if the it is not it is considered fail. This test also called ‘behavioral’ testing because this test is carried out to test the functionality of the program. 2. Tester do not know the design and the structure of the code and tester and user conduct this test on the software.   White box testing   1. In this test, tester will conduct to test the program and its implementation in order to improve the code efficiency or structure. This also known as ‘structural’ test. 2. Tester know the design and structural of the code and programmer of the code will conduct the test on the code. |
| **Q4** | (a) | Justify the important of software requirements.  (4 marks) |
|  |  | The importance of software requirement is to ensure the smoothness the development of the project. This is because all part of the software and the process must be understood by everyone. Software requirement also important because it is to ensure each requirement are as exactly as client want. |
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|  | (b) | Outline **FOUR (4)** generic activities of requirements engineering process.  (8 marks)  Generic activities of requirement engineering process are:   1. Requirement elicitation. It is a process to gain information about the project domain and project requirement. Some of the process are brainstorming, prototyping. 2. Requirement specification. This process is used to produce software requirement models. All requirement included are functional and non-functional requirement. 3. Requirement verification and validation. This process is to verify if the software is correctly implemented and to validate if the software is built traceable to customer requirement. 4. Requirement management. It is a process of analyzing, documenting, tracking, prioritizing and agreeing on the requirement and controlling the communication to relevant stakeholders. |
|  | (c) | Requirements based testing is a systematic approach to derive a set of test for each requirement. Specify **FOUR (4)** related testfor requirements statements in **Figure Q4**  Mental Care System Requirements:   * If a patient is known to be allergic to any particular medication, then prescription of that medication shall result in a warning message being issued to the system user.   If a prescriber chooses to ignore an allergy warning, they shall provide a reason why this has been ignored.    **FIGURE Q4**  (8 marks) |
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|  |  | 4 related tests for the requirement statements are:   1. Set up patient with no know allergic. Prescribe medication for allergies that are known to exist. Check that a warning message is not issued by the system. 2. Set up patient record with known allergic. Prescribe the medication to that patient is allergic to and check the warning message is issued by the system. 3. Prescribe two drugs that the patient is allergic to. Check that two warnings message are correctly issued. 4. Prescribe a drug that issues a warning and overrule that warning. Check that the system requires the user to provide information explaining why the warning was overruled. |
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* **END OF QUESTION-**

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