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|  | **COLLEGE OF COMPUTING AND INFORMATION SCIENCES** | | |
| **Mid-Term Assessment Fall 2021 Semester** | | |
| **Class Id** | 1062 [67 – 68 – 69] | **Course Title** | Software Engineering |
| **Program** | BSCS | **Campus / Shift** | Main/Morning |
| **Date** | 9th – March 2021 | **Total Marks** | 25 |
| **Duration** | 2 Hours | **Faculty Name** | Dr. Umema Hani |
| **Student ID** | 10209 | **Student Name** | Raid khan |

**General Instructions:**

* Filling out Student-ID and Student-Name on exam header is mandatory.
* Do not remove or change any part of exam header or question paper.
* Write down your answers by typing in given space or at the end of exam paper with proper title “Answer for Question# \_ \_”.
* Answers should be formatted correctly (font size, alignment and etc.)
* Handwritten text or image should be on A4 size page with clear visibility of contents.
* Only PDF format is accepted (Student are advise to install necessary software).
* In case of CHEATING, COPIED material or any unfair means would result in negative marking or ZERO.
* A mandatory recorded viva session will be conducted to ascertain the quality of answer scripts where deemed necessary.
* Caution: Duration to perform Mid-Term Assessment is 02 hours only. Extra 01 hours are given to cater all kinds of odds in submission of Answer-sheet. Therefore, if you failed to upload answer sheet on LMS (in PDF format) within 03 hours limit, you would be considered as ABSENT/FAILED.

**Faculty Instructions:**

* 1st **download** your Question paper **from “LMS”**, and from facebook post login the **Zoom url for queries** only if you want to ask any queries from your teacher in 1st 20 minutes or use url

[**https://kiet.zoom.us/j/83108868745?pwd=cDBxZURLa2N0MndwaWloSDhyUU13dz09**](https://kiet.zoom.us/j/83108868745?pwd=cDBxZURLa2N0MndwaWloSDhyUU13dz09)

* Rename your downloaded file as **MidtermpaperSE\_StudentID-ClassID.PDF**
* **Write down your answers by typing in given** **space colored orange.**
* Once completed **upload this Answer Files as PDF file** 1st **on “LMS”** and immediately send acknowledgement comment on “Facebook’s respective Post” as “**StudentID: Answer File Submitted Successfully**”, this message will be taken as your copy receiving signature.

|  |  |  |
| --- | --- | --- |
| **QUESTION** | **POINTS** | **POINTS OBTAINED** |
| Question 1 | 05 |  |
| Question 2 | 05 |  |
| Question 3 | 05 |  |
| Question 4 | 05 |  |
| Question 5 | 05 |  |
| Total | 25 |  |

|  |
| --- |
| Strictly, do not waste time in writing answers on Copy and then Pasting here, only insert answer of Q3 part 2 for SDLC |

**Question 1:** Case study – Requirement Engineering Phase:

(5 Marks) (Maximum time required = 15 minutes)

Consider yourself as working for a Software Development firm, and your management has asked your team to visit any client organization of your choice (your choice should be unique and known only to yourself), whose management is seeking a Software based solution for a problem they are facing.

Fill in the given information regarding your selected scenario.

**Answer:**

* Name of Client organization:\_NIKE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Mention targeted Software based system name: Inventory Management System
* Mention any 5 major business functionality-wise Module names including the (first User Authorization module):

**Answer:**

|  |
| --- |
| **Module Decomposition** |
| **Module 1:** User Authorization  User login |
| **Module 2: \_\_Order Management\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  This module can manage User's Orders. |
| **Module 3: \_\_\_Shipping Management\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  This module can manage companie's products stock and shipping as well. |
| **Module 4: \_\_\_\_\_\_Product History\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  This module can record all products, import and export and their Qty. |
| **Module 5: \_\_Reporting and Analytics\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  This module can manage Sales and Purchase |

* Now assume you have gone through the inception and elicitation activities of Requirement Engineering phase. Provide more detail of the Functional Requirements of above System up to the level of, “End User Category” wise “CRUDS” functions for each Module as specified in part 3 above. Write Tick mark (√) against the applicable “CRUDS” functions or rights and use “more description” box if still you want to elaborate if further. You can add more rows to add more “Client types” under the “End User Category” column.

If there are two major end user categories for the System i.e. Admin with high privileges and a Client with restricted low privileges. Then you can change appropriate user category names for Client type user such as students or buyers etc.

**Answer:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Functional Requirements** | | | | | | | |
| **Module #** | **End User Category** | **Create** | **Review** | **Update** | **Delete** | **Search** | **More description** |
| **Module 1** | Admin | **√** | **√** | **√** | **√** | **√** | Of All users |
|  | Customer | **√** | **√** | **√** | **-** | **-** | Only for its own user |
|  |  |  |  |  |  |  |  |
| **Module 2** | Admin | **-** | **√** |  | **√** | **√** |  |
|  | Customer | **√** | **√** | **√** | **-** | **-** |  |
|  |  |  |  |  |  |  |  |
| **Module 3** | Admin | **√** | **√** | **√** | **√** | **√** |  |
|  | Customer | **-** | **-** | **-** | **-** | **-** |  |
|  |  |  |  |  |  |  |  |
| **Module 4** | Admin | **√** | **√** | **√** | **√** | **√** |  |
|  | Customer | **-** | **-** | **-** | **-** | **-** |  |
|  |  |  |  |  |  |  |  |
| **Module 5** | Admin | **√** | **√** | **√** | **√** | **√** |  |
|  | Customer | **-** | **-** | **-** | **-** | **-** |  |
|  |  |  |  |  |  |  |  |

**Question 2:** Change Management, Requirement Validation, and Negotiation Activities: (5 Marks) - (Maximum time required = 15 minutes)

* As, we know that even during the Requirement Engineering phase activities, the sudden changes raised by the client are unavoidable. How you will tackle this issue using appropriate tool support? Also paste screen capture of Tool repository showing your SRS.doc file on repository, where repository must be shown with your name.

**Answer:**

|  |
| --- |
| **Change Management and Version controlling** |
| **How you will tackle the frequent changes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Tool Name: \_\_\_\_Github\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Your Name: \_\_\_\_\_\_Raid Khan\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Screen Capture of tool repository showing SRS.doc file:**  < Insert Screen Capture here> |

* If your team has successfully composed an SRS document. You have to present it to the Client for Negotiation purpose but, before that your Quality department has to Validate it through Review of this work product of Requirement Engineering phase.

List down and explain with example, what major deficiencies or aspects will be checked in during the validation review.

**Answer:**

|  |
| --- |
| **Requirement Validation Review checklist for SQA department** |
| * **Aspect Name:** Standard Version Checking ….   **Example:** <Type Here> |
| * **Aspect Name:** <Type Here>   **Example:** <Type Here> |
| * **Aspect Name:** <Type Here>   **Example:** <Type Here> |

* Assume the above highlighted issues has been removed. Now produce an example of, that you have faced a conflicting or unnecessary multiple viewpoint against any 1 Module’s Functional Requirements. While doing so, first create the 2nd view point that will look unnecessary and show its solution by marking the requirement statuses as “Expected, Normal, Excited” against all the viewpoints for your selected module.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Multiple Viewpoints of Functional Requirements** | | | | | | | | | |
| **Module #** | **View Point by client side Stakeholders** | **End User Category** | **Create** | **Review** | **Update** | **Delete** | **Search** | **More description** | **Requirement Status**  **(Expected, Normal, Excited)** |
| **Module 1** | Security personal | Admin | **√** | **√** | **√** | **√** | **√** | All user |  |
| Security personal | Client type1 | **√** | **√** | **√** | **√** | **-** | Its own user |  |
| Cafeteria Manager | Client type2 |  |  |  |  |  |  |  |

**Question 3:** Project Planning Phase:

(5 Marks) (Maximum time required = 15 minutes)

* After the acceptance your contract based on the SRS.doc that you have finalized in Requirement Engineering phase, and after the negotiation activity in last question. Now you have to progress into a Project Planning phase of your Project.

For the given major headings of your “Software Project Management Plan document” SPMP.doc, suggest what relevant activities or phase-wise work products they will relate to.

**Answer:**

|  |  |
| --- | --- |
| **Software Project Management Plan document SPMP.doc** | |
| **Document Headings** | **Description of Activities or Work Product** |
| **1. Introduction**  1.2 Project Deliverables | 1.2 |
| * **Project Organization** * **Process Model** * Organizational Structure * Organizational Interfaces * Project Responsibilities | 2.1  2.2  2.3  2.4 |
| * **Managerial Processes** |  |
| * **Technical Processes** * Methods Tools and Techniques * Software Documentations | 4.1  4.2 |
| * **Work Packages, Schedule, and Budget** |  |

* As you are about to work on your SPMP.doc and you need to produce the relevant details for the sections which are marked red in table above.

Now propose the best suitable SDLC model for this whole Project which is constrained to be implemented for your Course project, in a team of 5 members, and within a duration of 3.5 months maximum.

You can copy paste the basic model diagram from the Slides and must make necessary changes in it to reflect the phase wise parallel working of all members which first integrated before the relevant work product’s review and submission to the Project Manager who is your course instructor. Keep it in your mind that final Project demo will be performed on an integrated version of the Software.

Also mention, what if you use any of the agile models instead but it won’t suit under this Project constraints. Mention any major two agile manifestos which will conflict with our course Project constraints.

**Answer:**

|  |
| --- |
| **Model name:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| <insert Model snap here you can also draw it on your register page if comfortable> |
| Any two major reason why Agile Models would have fail in this Project scenario?   * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Question 4:** Project Planning and Estimation Phase:

(5 Marks) (Maximum time required = 15 minutes)

You are still working on Project Planning phase of your Project. Now your team needs to perform estimation of Project Time and Manpower, which is impossible without having a reliable estimate of Project Size metric.

Show in depth working of Function Point method for estimating Project Size on this Project based upon the actual facts of Functional Requirements as planned by you in Question 1.part 4.

Clearly mention all your assumptions and try to use some low as well as some middle complexity Transactions.

**Answer:**

|  |
| --- |
| **Software Size Estimation using Function Point Method** |
| |  |  | | --- | --- | | * **Detail of 5 Transaction Types, at most 5 under each category** | | |  | Write down exact Screen or Forms names, or Tables, or Reports name for each count value. | | EI | 1. 2. 3. 4. 5. \_\_\_\_\_\_\_\_\_\_ | | EO | 1. 2. 3. 4. 5. \_\_\_\_\_\_\_\_\_\_ | | EQ | 1. 2. 3. 4. 5. \_\_\_\_\_\_\_\_\_\_ | | ILF | 1. 2. 3. 4. 5. \_\_\_\_\_\_\_\_\_\_ | | ELF | 1. 2. 3. 4. 5. \_\_\_\_\_\_\_\_\_\_ | |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | * **Unadjusted Function Point Value calculation** | | | | | | | | | | | | **Definition of Complexities:** Your Transactions which are derived from only from 1 Table are to be categorized as Low and if they are derive from 2 tables they can be categorized in Mid-level complexity, and in case of >= 3 they will be placed under High level of complexity. | | | | | | | | | | | |  | Count for screens of Low level complexity (C) | Multiplier  Low level complexity (M) | V1 = C \* M | Count for screens of Mid-level complexity (C) | Multiplier  Mid-level complexity (M) | V2 = C \* M | Count for screens of High-level complexity (C) | Multiplier  High-level complexity (M) | V3 = C \* M | Category wise sum  V1+V2+V3 | | EI |  | 3 |  |  | 4 |  |  | 6 |  |  | | EO |  | 4 |  |  | 5 |  |  | 7 |  |  | | EQ |  | 3 |  |  | 7 |  |  | 6 |  |  | | ILF |  | 7 |  |  | 0 |  |  | 15 |  |  | | ELF |  | 5 |  |  | 7 |  |  | 10 |  |  | | Unadjusted Function Point Value = | | | | | | | | | | \_\_\_\_\_\_\_\_\_ | |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **C) Value Adjustment Factor (VAF) calculation** | | | | | | | **Note:** Calculate Value Adjustment Factor, where any 5 "General System Characteristics (GSC) must have a value above 2. Also show respect Quality Characteristic mapping of these 5 factors. | | | | | | |  | Quality Characteristic | Weight  (0-5) |  | Quality Characteristic | Weight  (0-5) | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | | Value Adjustment Factor (VAF) = | | | | | | |
| **D) Technology Complexity Factor calculation**  TCF = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  TCF = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  TCF = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **E) Adjusted Function Point Value (AFPV) or Function Point Value (FP) Calculation**    AFPV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  AFPV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  AFPV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **F) Conversion of AFPV in to LOC Size metric**  Consider if the number of LOCs per FP is equal to your Student ID then calculate Size in Loc  StudentID = \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Project Size in LOC = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Project Size in LOC = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Question 5:** Project Planning and Estimation Phase continued:

(5 Marks) (Maximum time required = 15 minutes)

You are still working on estimation activity of Project Planning phase and calculated the Software Size in Loc in previous question.

In continuation to the Size value calculated in previous question, now your team needs to perform estimation of following major metrics using the appropriate mode of Basic COCOMO model:

* Effort or Manpower
* Schedule or TDEV
* Productivity
* Average Loading
* Average Salary of Technical Staff (As)
* Cost for salary (Cs)
* Budgeted Cost of Project (Cb)

**Answer:**

|  |
| --- |
| **Software Size: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Software Size for COCOMO: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Software Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Model Mode:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| * **Effort Estimation:** Equation   <Detailed Calculation>  <Detailed Calculation>  <Detailed Calculation> |
| * **Schedule Estimation:** Equation   <Detailed Calculation>  <Detailed Calculation>  <Detailed Calculation> |
| * **Productivity Estimation:** Equation   <Detailed Calculation>  <Detailed Calculation> |
| * **Average Loading Estimation:** Equation   <Detailed Calculation>  <Detailed Calculation> |
| * **Average Salary of Technical Staff (AS):** Equation   <Detailed Calculation>  <Detailed Calculation>  <Detailed Calculation> |
| * **Cost for Salary (Cs):** Equation   <Detailed Calculation>  <Detailed Calculation>  <Detailed Calculation> |
| * **Budgeted Cost of Project (Cb):** Equation   <Detailed Calculation>  <Detailed Calculation> |

**BEST OF LUCK**