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# PES University, Bengaluru

(Established under Karnataka Act No. 16 of 2013)

UE15CS402

## END SEMESTER ASSESSMENT - ESA
## B.TECH. VII SEMESTER
## UE15CS402 – Software Engineering
## Session – August December 2018

Time: 180 minutes | Answer All Questions | Max Marks: 100

- **Answers should be in the same order as the questions**
- Make assumptions where-ever necessary and write the same
- Length of answers should be proportional to the marks allocated

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| 1 | a | Assume that you are a project manager of two projects with the following characteristics:<br>▪ Project 1: A real-time system which is complex but whose requirements can be relatively easily identified and are stable.<br>▪ Project 2: A web-site for a local clinic. Requirements are vague and are likely to change in the future.<br>Consider the following software development approaches/models: waterfall, incremental, evolutionary prototyping, throw-away prototyping and component-based development.<br>(i) Which of the above models would you choose for each of your projects?<br>(ii) Justify your choice for each of the project | 5 |
| | b | Discuss the following terminologies in the context of Agile Scrum<br>1. Scrum meeting<br>2. Sprint<br>3. Scrum Master<br>4. Sprint Review<br>5. Project Backlog | 5 |
| | c | What is Component Based Software Engineering (CBSE)? List 2 advantages and 2 disadvantages of CBSE | 5 |
| | d | Contrast SDLC and Product Lifecycle | 5 |
| 2 | a | Consider yourself to be responsible for development of the software which manages workflow in a car service center. Making assumptions as necessary<br>1. Discuss the steps involved (using Software Engineering principles) in coming up with a set of requirements which can be used for the development of the system<br>2. In case a couple of new requirements needed to added into the system, discuss on the change management process which you would use. | 5 |

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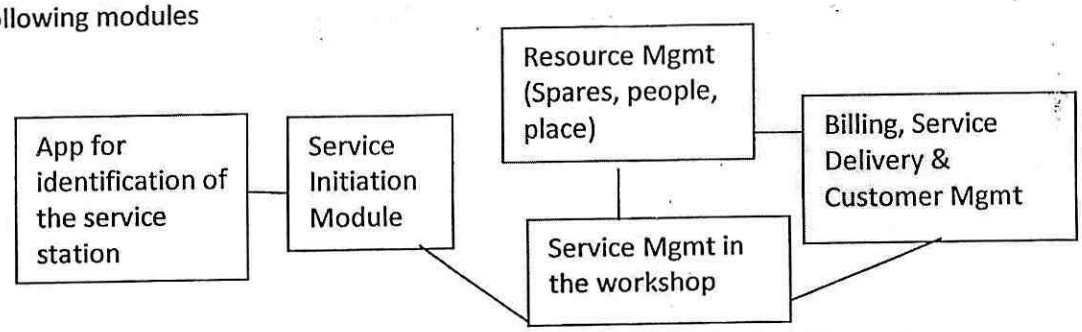
| 2 | b | Assume the above software for the car service-center, at a high level, needs to have the following modules<br>  <br><br>and if you as a person accountable for building this system, and had 5 people resources, and assuming all of the modules have very varied complexity, build a schedule for project, following formal SE planning process activities. | 5 |
| | c | In the context of project planning and control, discuss the following<br>1. Upstream and Downstream dependencies<br>2. Risks in terms of identification, trigger and mitigation | 2<br>3 |
| | d | Discuss one Architectural pattern which you could use in building the software for the car service center, in terms of generic description of the pattern, the benefit of using the pattern and potential issue/liability of using the pattern. | 5 |
| 3 | a | Describe (1-2 sentences) 5 principles/techniques which influence a good design | 5 |
| | b | Discuss<br>1. What are Configuration Items? Provide one example of Configuration Item and discuss one of its challenges<br>2. What is Baselining? Provide one example of a Baseline and discuss one its challenges | 5 |
| | c | **Pick the odd one in the set of choices**<br>1. Software Design<br>a) Is a prescriptive process<br>b) Outcome is the same as the process<br>c) Problems have a clear true or false solution<br>d) Has no stopping rules<br>2. The following are examples of Architectural conflicts<br>a) Using large grain components improves performance but reduces maintainability<br>b) Introducing redundant data improves availability but can reduces integrity<br>c) Localizing safety degrades performance<br>d) Improved depth of security increases Usability | 5 |

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| 3 | c | 3. Which of the following design methodologies first specifies the individual base elements of the system in great detail?<br>a) Top down design<br>b) Bottom up design<br>c) Component-based design<br>d) Pattern-oriented design<br>4. Estimation in most scenarios is best started with estimating<br>a) Effort<br>b) Schedule<br>c) Cost<br>d) People<br>5. Discontinuance of a product is more associated with<br>a) Stopping of Sales and Support of the product<br>b) Stopping the sales of the product<br>c) Stopping the support of the product<br>d) Stopping customers from using the product | |
| | d | In the following piece of C code, (ignore the line numbers 1 to 6) identify atleast 5 coding practices which could make the code to be readable.<br>1 int uglyduck (int t1; int array[], int l)<br>2 {<br>3 Int i;<br>4 for (i ; i < l; i++) if (num == array[i]) break;<br>5 if (i == l) return -1; else return i;<br>6 }<br>Modify the code with the guidelines identified to show how it will make it readable. | 5 |
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| 4 | a | Discuss 5 techniques which you could use during implementation for testability | 5 |
| | b | Discuss a generic testing process and describe the contents of an ideal test case | 5 |
| | c | Choose the **MOST** appropriate one which **DOES NOT** belong to the group<br>1. The following characterizes a program<br>a) A program is for the programmer who reads it, not for the computer that runs it<br>b) Programs have "personalities": messy, verbose, cryptic, neat<br>c) A program is written once, but read and modified a lot many times.<br>d) Program is well written when it makes it difficult for others to modify it | 5 |

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| 4 | c | 2. "Testability" is the ease of verifying that a software product satisfies its specifications and requirements. Which of the following is NOT a tactical technique meant to enhance testability?<br>a) Building "test points" into the code (which can be used for setting or retrieving current module status and variable contents.)<br>b) Including "test stubs" (that returns known fixed values that emulate functions not currently under test)<br>c) "Instrumenting" the code (such as adding execution logging and "I got here" messages so that the module under test reveals more about its operation).<br>d) Add one more tester to the team.<br>3. The main difference between Verification and Validation can be explained by the following statement(s) in the order given below:<br>a) Essentially, they are the same and can be used interchangeably<br>b) Building the thing right, building the right thing<br>c) Building the right thing, building the thing right<br>d) Verification takes place during post the testing phases; validation takes place during the testing phase<br>4. Characterization of an effective test case is<br>a) When it finds issues<br>b) When it can be easily executed<br>c) When it has higher percentage of code coverage<br>d) When it validates the features under test<br>5. A developer has been assigned to work on a defect report. Once the developer identifies and makes necessary change(s) to the relevant module(s), she has to test the software to make sure that the defect has been fixed correctly. Further, she also runs tests that have been run previously and have succeeded. This test to ensure that she has not introduced any new defects while making a code change is known as:<br>a) Regression testing<br>b) Integration testing<br>c) Unit testing<br>d) Acceptance testing | |
| | d | Contrast<br>1. Process capability, Process performance and Process maturity<br>2. Contrast Testing and Requirement Traceability Matrix | 3<br>2 |
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| 5 | a | List atleast 2 metrics which you would look for understanding the quality of each of the SDLC phases of requirements, design, implementation, testing and overall project. | 5 |

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| | b | Discuss the set of activities involved in software maintenance | 5 |
| | c | Choose the **MOST** appropriate one which **DOES NOT** belong to the group<br>1. Software maintenance happens due to<br>a. Correcting of faults in the software<br>b. Improving of the design of the software<br>c. Implementation of new features<br>d. need for generating revenues from the software<br>2. Hacking is closer to<br>a. Using non-traditional means to quickly solve problems<br>b. Systematic problem solving<br>c. Abusing the system for solving a problem<br>d. Illegal way of solving a problem<br>3. Ethical characteristics for a good software developer are characterized with<br>a. Adherence to characteristics like Integrity, Honesty, Accountability, law abiding<br>b. Not plagiarizing work or Intellectual property<br>c. Ensuring that you deliver at whatever cost/approach to what is being measured<br>d. Ensuring confidentiality of resources and work as expected from the organization<br>4. Availability of a product is characterized by<br>a. Can I use it<br>b. Can I use it wherever I want it<br>c. Can I use it whenever I want it<br>d. Will I have the permissions to use it<br>5. Software Reliability has relationship with<br>a. Mean Time Between Failure (MTBF)<br>b. Failure Rate<br>c. Fault Density<br>d. Mean Time for recovery | 5 |
| | d | Name 5 reasons which support the need of Global Software Development | 5 |