**SRM Institute of Science and Technology**

**Faculty of Engineering and Technology**

**School of Computing**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

**Academic Year: 2021 -2022 EVEN**

**Course Code & Title: 18CSC206J Software Engineering. & Project Management**

**Year & Semester:** **II / IV**

**SET 1 Cycle Test 2 DATE: 1 June 2022**

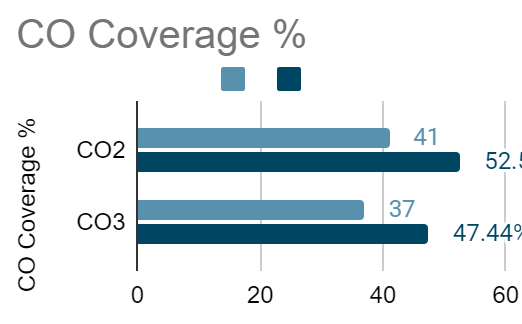
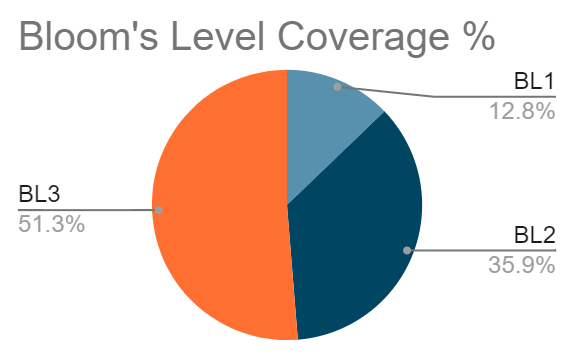
**Course Articulation Matrix:**

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| S. No. | Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | CO1 | *3* | *2* | *1* |  |  |  |  |  | *2* | *2* | *3* | *2* |
| 2 | CO2 | *3* | *2* | *2* | *2* | *3* |  |  |  | *2* | *1* | *1* | *2* |
| 3 | CO3 | *3* |  | *3* |  | *3* |  |  |  | *3* | *1* | *1* | *2* |
| 4 | CO4 |  | *2* |  |  | *2* |  |  | *2* | *3* | *2* | *1* |  |
| 5 | CO5 |  |  |  |  |  | *2* | *1* | *1* |  | *3* | *2* |  |

| **Part – A (Answer All Questions) 10 \* 1 = 10 Marks** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No** | **MCQ** | **Marks** | **BL** | | **CO** | | **PO** | **PI Code** |
| **1** | **----------------- is to define a set of interface objects and actions that enable a user to perform all defined tasks.**  **A. Interface Analysis**  **B. Interface Design**  **C. Interface Construction**  **D. Interface Validation**  **ANSWER: B** | **1** | **1** | | **2** | | **1** | **1.1.2** |
| **2** | **Which design model elements are used to depict a model of information represented from the user’s view?**  A.component level elements  B.user interface elements  C.architectural elements  D.data design elements  **ANSWER: D** data design elements | **1** | **1** | | **2** | | **3** | **2.6.2** |
| **3** | **Software systems are supported by the design that provides a sound, fault tolerant and \_\_\_\_\_\_\_\_ structure.**  **A. Synchronous**  **B. Scalable**  **C. Incremental**  **D. Rigid**  **ANSWER: B** | **1** | **1** | | **2** | | **3** | **3.5.1** |
| **4** | **Identify the best model which can be used to pictorially represent archetypes of an architectural design**  **A. CSS**  **B. HTML**  **C. UML**  **D. ADL**  **ANSWER: C** | **1** | **1** | | **2** | | **2** | **2.1.1** |
| **5** | **------------- is an indication of the relative interdependence among modules.**   1. **Cohesion** 2. **Coupling** 3. **Elaboration** 4. **Refactoring**   **ANSWER: B** | **1** | **1** | | **2** | | **2** | **1.3.1** |
| **6** | **Standard naming conventions should be used so that the code has**  **A. Modularity**  **B. Reliability**  **C. Clarity**  **D. Safety**  **ANSWER: C** | **1** | **1** | | **3** | | **4** | **1.7.1** |
| **7** | **\_\_\_\_\_\_\_\_Occurs when one component “surreptitiously modifies data that is internal to another component”**  **A. Common Coupling**  **B. Content Coupling**  **C. Control Coupling**  **D. Stamp Coupling**  **ANSWER: B. Content Coupling** | **1** | **3** | | **3** | | **4** | **3.6.2** |
| **8** | **Many businesses find that being able to reuse classes on a subsequent project saves them money on development\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**  **A. Decrease return**  **B. Increase return**  **C. No return**  **D. Infinite return**  **ANSWER:B** | **1** | **4** | | **3** | | **2** | **2.7.2** |
| **9** | **SOA has been evolved recently for the purpose of \_\_\_\_\_\_\_\_\_.**  **A. Software construction**  **B. Inspection**  **C. Code Reuse**  **D.** **Code Review**  **ANSWER:C** | **1** | **2** | | **3** | | **3** | **1.6.1** |
| **10** | **Which among the following firms is working to develop an automatic code generation system?**  **A. Sun Microsystems**  **B. HP**  **C. IBM**  **D. Dell.**  **ANSWER:A** | **1** | **2** | | **3** | | **3** | **1.2.1** |
| **Part – B (Answer Any Four Questions) 4 \* 4 = 16 Marks** | | | | | | | | |
| **11** | **Mention the three goals of the software design process and brief them.**  **ANSWER:**  1) The design must implement all of the explicit requirements contained in the requirements model and it must accommodate all of the implicit requirements desired by stakeholders.  2) The design must be a readable, understandable guide for those who generate code and for those who test and subsequently support the software.  3) The design should provide a complete picture of the software, addressing the data, functional, and behavioral domains from an implementation perspective. | **4** | **2** | | **2** | | **3** | **3.5.1** |
| **12** | **Categorize the various architecture partitioning techniques. List out the advantages of partitioning the architecture**  **• Results in software that are easier to test**  **• Leads to software that are easier to maintain**  **• Results in propagation of fewer side effects**  **• Results in software that are easier to extend**  **Horizontal Partitioning**  **• Define separate branches of the module hierarchy for each major function**  **• Use control modules to coordinate communication between functions**    **Vertical Partitioning – Factoring**  **• Design so that decision making and work are stratified**  **• Decision making modules should reside at the top of the architecture** | **4** | **2** | | **2** | | **3** | **3.6.1** |
| **13** | **With an example draw any component structure highlighting the archetypes** | **4** | **3** | | **3** | | **3** | **3.5.1** |
| **14** | **Code reuse can reduce the labor intensive nature of writing source code. List out methods that can achieve the same.** | **4** | **2** | | **3** | | **4** | **5.4.1** |
| **15** | **Describe automatic code generation.**   * There are business analyst platforms developed by many ERP software vendors that generate code automatically when analysts configure the product. * These analyst platforms are first built using any of the software product development methodologies. * The generated code is specific to the platform and runs on the device (hardware and software environment) for which the code is generated. * Generally, any code consists of many construction unit types. * Some of these code types include control statements such as loop statements, if statements, etc., database access, etc. | **4** | **2** | | **3** | | **5** | **5.4.1** |
| **Part – C (Answer All Questions) 2 \* 12 = 24 Marks** | | | | | | | | |
| **16** | **Illustrate the steps to represent a typical task set for component-level design, when it is applied for an object-oriented system.**  **• The figure above illustrates the overall architectural structure for SafeHome with top-level components.**  **• These analysis classes represent entities within the application (business) domain that must be addressed within the software architecture.**  **• Hence, the application domain is one source for the derivation and refinement of components.**  **• Another source is the infrastructure domain. The architecture must accommodate many infrastructure components that enable application components but have no business connection to the application domain.**  **• In regards to the SafeHome home security function example, the set of top-level components might be defined to address the following functionality:**  **1. External communication management – coordinates communication of the security function with external entities such as other Internet-based systems and external alarm notification.**  **2. Control panel processing – manages all control panel functionality.**  **3. Detector management – coordinates access to all detectors attached to the system.**  **4. Alarm processing – verifies and acts on all alarm conditions.** | **12** | | **3** | | **2** | **3** | **3.8.2** |
| OR | | | | | | | | |
| **17** | **IrisGold is a gold mining company that operates on three continents, with more than 21,000 employees. The company’s mines are mostly located in remote places like the Amazonas in Brazil, the Andes mountain range, the Ural mountains in Russia, and eastern South Africa. The company is selecting an Enterprise Resource Planning (ERP) system package. Suggest Which architecture is suitable to build the same with a neat diagram and a suitable description**  **Answer:**  **Data Centered Architecture/Client Server Architecture**  **Diagram: 4 Marks**  **Explanation: 5 Marks**  **Justification with advantages: 3 marks** | **12** | | **3** | | **2** | **3** | **3.8.2** |
|  | | | | | | | | |
| **18** | **Illustrate with appropriate reasons regarding why configuration management plays a significant role in software construction**   * Configuration management plays an important role in the construction phase. * Due to changes in requirements and design, an already developed source code needs to be changed. * So it happens that the development team ends up with many versions of a source code during the project. * If the version control management is not handled properly, then many developers may start working on a wrong version of source code, and thus a lot of rework may be needed in the end. * There is one more dimension to configuration management for the construction phase. * During construction, many software builds are maintained for different versions of the product being developed. * These builds can break if a bad piece of code is checked into the build by any developer. * When the build is broken, then no other developer can check in his code. * Thus, development is halted until the build is rebuilt with the correct code. * Imagine what may happen in the case of distributed teams located at far-flung locations with different time zones and a central build is being maintained. * It will be difficult to communicate and manage the build process in such a scenario. * In such scenarios, smoke test application can be deployed, which can run whenever a new code is checked-in in the build. * If the smoke test fails, that means the build has failed and thus the automated system can e-mail the build information to concerned people. * If the build fails, then the developer who had checked-in the code gets the message and immediately tries to fix the build. * Once the build is fixed, then other developers can check-in their code. * Thus, configuration management plays an important role in the construction phase. | **12** | | **3** | | **3** | **1** | **1.3.1** |
| OR | | | | | | | | |
| **19** | **How significant is quality control for software construction ? Explain them in detail.**   * It is estimated that almost 70% of software defects arise from faulty software code. * To compound this problem, software construction is the most labor intensive phase in software development. * Any construction rework means wasting a lot of effort already put in. * Moreover, it is also a fact that it is cheaper to fix any defects found during construction at the phase level itself. * If those defects are allowed to go in software testing (which is the next phase), then fixing those defects will become costlier. * That is why review of the software code and fixing defects is very important. * There are some techniques available like desk-checks, walkthroughs, code reviews, inspections, etc. that ensure quality of the written code (Figure below-Source code review methods and their operation sequence).      * These different kinds of reviews are done at different stages in software code writing. * They also serve different purposes. * While inspections provide the final go/no go decision for approval of a piece of code, other methods are less formal and are meant for removing defects instead of deciding whether a piece of code is good enough or not.   **ATLEAST 2 points per technique**  **Reviews – Desk-checks (Peer Reviews)**   * Desk-checks are employed when a complete review of the source code is not important. * Here, the developer sends his piece of code to the designated team members. * These team members review the code and send feedback and comments to the developer as suggestions for improvement in the code. * The developer reads those feedbacks and may decide to incorporate or to discard those suggestions. * So this form of review is totally voluntary. * Still, it is a powerful tool to eliminate defects or improve software code.   **Reviews – Walkthroughs**   * Walkthroughs are formal code reviews initiated by the developer. The developer sends an invitation for walkthrough to team members. * At the meeting, the developer presents his method of coding and walks through his piece of code. * The team members then make suggestions for improvement, if any. * The developer then can decide to incorporate those suggestions or discard them.   **Reviews – Code Reviews**   * Code reviews are one of the most formal methods of reviews. The project manager calls for a meeting for code review of a developer. * At the meeting, team members review the code and point out any code errors, defects, or improper code logic for likely defects. An error log is also generated and is reviewed by the entire team.   **Reviews – Inspections**   * Code inspections are final reviews of software code in which it is decided whether to pass a piece of code for inclusion into the main software build. | **12** | | **3** | | **3** | **4** | **1.3.1** |
|  |  |  |  |  |  |  |  |  |

**Course Outcome (CO) and Bloom’s level (BL) Coverage in Questions**

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**Year & Semester:** **II / IV**

**SET 2 Cycle Test 2 DATE: 1 June 2022**

**Course Articulation Matrix:**

| S. No. | Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | CO1 | *3* | *2* | *1* |  |  |  |  |  | *2* | *2* | *3* | *2* |
| 2 | CO2 | *3* | *2* | *2* | *2* | *3* |  |  |  | *2* | *1* | *1* | *2* |
| 3 | CO3 | *3* |  | *3* |  | *3* |  |  |  | *3* | *1* | *1* | *2* |
| 4 | CO4 |  | *2* |  |  | *2* |  |  | *2* | *3* | *2* | *1* |  |
| 5 | CO5 |  |  |  |  |  | *2* | *1* | *1* |  | *3* | *2* |  |

| **Part – A (Answer All Questions) 10 \* 1 = 10 Marks** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No** | **MCQ** | **Marks** | **BL** | | **CO** | | **PO** | **PI Code** |
| **1** | **Refactoring is a design technique that is used in \_\_\_\_\_ models. (S2.1)**  **A. Iterative**  **B. Dynamic**  **C. Static**  **D. Entity Relationship**  **ANSWER: A** | **1** | **2** | | **2** | | **3** | **3.5.1** |
| **2** | **Which design is used to transforms structural elements of the software architecture in to a procedural description of software components?**  A.Interface  B.Component  C.Activity  D.package  **ANSWER:** B.**Component** | **1** | **4** | | **2** | | **3** | **3.5.2** |
| **3** | **Which pattern addresses problems associated with the assignment of responsibility between objects and the manner in which communication is effected between objects?**  **A. Creational pattern**  **B. Structural patterns**  **C. Behavioral patterns**  **D. Object pattern**  **ANSWER: C** | **1** | **2** | | **2** | | **1** | **2.1.1** |
| **4** | **The software product must be ensured to operate correctly and chances of error are less than 0.00001% refers to**  **A Modularity**  **B. Reliability**  **C. Clarity**  **D. Safety**  **ANSWER:D** | **1** | **2** | | **2** | | **4** | **2.7.2** |
| **5** | **A good software design will have**  **A. High Coupling**  **B. Low Coupling**  **C. Average Coupling**  **D. Very high Coupling**  **ANSWER: B** | **1** | **1** | | **2** | | **1** | **1.3.1** |
| **6** | **Which is not a type of Review?**  **A. Requirement Analysis**  **B. Peer to peer**  **C. Technical**  **D. Inspection**  **ANSWER: A** | **1** | **2** | | **3** | | **1** | **1.7.1** |
| **7** | **Converting the specifications into software code is totally dependent on the \_\_\_\_\_\_\_\_ team.**  **A. Constructing**  **B. Sales**  **C. Debugging**  **D. Testing**  **ANSWER: A** | **1** | **1** | | **3** | | **3** | **3.5.1** |
| **8** | **Choose Which of the following is first stage of TDD?**  **A. Write Code**  **B. Write Test**  **C. Refactor**  **D. Execute Test**  **ANSWER: B Write Test** | **1** | **3** | | **3** | | **4** | **3.8.3** |
| **9** | **Which of the following firm is working to develop an automatic code generation system?**  **A. Sun Microsystems**  **B. HP**  **C. IBM**  **D. Dell**  **ANSWER: A** | **1** | **1** | | **3** | | **5** | **5.4.1** |
| **10** | **Which coding method supports with the code once the product is configured in the design window?**  **A. Pair programming**  **B. Automatic Code Generation**  **C. Object oriented programming**  **D. Test driven development**  **ANSWER: B** | **1** | **2** | | **3** | | **2** | **2.1.2** |
| **Part – B (Answer Any Four Questions) 4 \* 4 = 16 Marks** | | | | | | | | |
| **11** | **How significant is a software design for a software system?**   * When a building is constructed, a good foundation is laid out for the building, so that the building will have a long lifespan and will not collapse. * Similarly, software design provides the foundation and structure upon which the software system is constructed. * The design should provide a sound, resilient and scalable structure to support the software system * In these days, most software systems are built incrementally. * In the beginning, a software system may consist of only a few features. * The feature set is expanded in future releases as and when it becomes necessary to include them in the system. * If proper structure is not provided from the very beginning, the addition of these new features will make the system unstable. * To deal with this problem, a technique called refactoring is used on these agile projects where incremental software development is done. | **4** | **2** | | **2** | | **2** | **2.1.2** |
| **12** | **Enlist the benefits of Top-Down approach?**   * **There are many benefits to the top -down approach.** * **Non-functional aspects are taken care of at the beginning of design, and hence they are an integral part of the product and not an after-thought.** * **This makes a secure, robust, and usable product.** * **A top- down approach also helps in creating reusable components and hence increases productivity as well as maintainability.** * **This approach also promotes integrity, as the whole product is designed inside a single framework.** * **So a fragmented and dissimilar approach for designing different parts of the product is avoided.** | **4** | **1** | | **2** | | **2** | **2.7.1** |
| **13** | **List out the Characteristics of a software product code that requires refactoring which becomes necessary to change the internal structure of software code.**  **Answer:**  Whenever a software product is designed, it is done with good intentions.  Care is taken to ensure that the design is extensible, so that when customer needs increase over time, the product can be extended to take care of those increased needs.  Unfortunately, even this foresight is not enough, and it becomes difficult to extend the product functionality further. In such cases, it becomes necessary to change the internal structure of software code without changing external behavior of the software product.  Figure - Characteristics of a software product code that requires refactoring | **4** | **3** | | **3** | | **4** | **3.5.1** |
| **14** | **Explain in detail various coding methods which convert design into optimal software construction.**  **Answer:**  Structured programming  Object oriented Programming  Automatic code generation  Pair programming  Software code reuse  Test driven development | **4** | **3** | | **3** | | **5** | **3.6.1** |
| **15** | **Explain the design life-cycle management with neat sketch.**   * **The software design is in the form of activity diagrams, use cases, prototypes, etc.** * **Once the design process is complete, these design documents are verified and validated through design reviews.**   **· Once the design is reviewed and approved, then the design phase is over** | **4** | **2** | | **2** | | **2** | **2.7.1** |
| **Part – C (Answer All Questions) 2 \* 12 = 24 Marks** | | | | | | | | |
| **16** | **Explain how to Translating the requirements analysis model into the design model**  **Answer:** | **12** | | **3** | | **2** | **3** | **3.8.2** |
| OR | | | | | | | | |
| **17** | **Amaze is a project management software company. Their product is sold globally with a monthly pay-per-user model and widely known among the project management community for being easy to use and able to operate on many different devices (PCs, Notebooks, laptops, tablets, iPhones, iPads, and Android phones). The business problem is very straightforward: Amaze must work on any popular device on the market and be able to support future devices. There must be only one version of the software for all devices. No special cases, no exceptions allowed**  **Suggest Which architecture is suitable to build the same with a neat diagram and a suitable description**  **Answer:**  **Layered architecture**  **Diagram: 4 Marks**  **Explanation: 5 Marks**  **Justification with advantages: 3 marks** | **12** | | **3** | | **2** | **3** | **3.1.3** |
|  | | | | | | | | |
| **18** | **Explain about software coding standards with a neat sketch**   * Developers are given software design specifications in the form of use cases, flow diagrams, UI mock ups, etc., and they are supposed to write a code so that the built software matches these specifications. * Converting the specifications into software code is totally dependent on the construction team. * How well they do it depends on their experience, skills and the process they follow to do their job. * Apart from these facilities, they also need some standards in their coding so that the work is fast as well as has other benefits like maintainability, readability and reusability (Figure-Source Code Production (Conversion) from Software Design).      * At any time, a code written by a developer will always be different from that written by any other developer. * This poses a challenge in terms of comprehending the code while reusing the code, maintaining it, or simply reviewing it. * A uniform coding standard across all construction teams working on the same project will make sure that these issues can be minimized if not eliminated (Figure below - Software Construction Characteristics). * Some of the coding standards include standards for code modularity, clarity, simplicity, reliability, safety and maintainability.      * **AT LEAST one point about each standard** | **12** | | **1** | | **3** | **1** | **1.6.1** |
| OR | | | | | | | | |
| **19** | **How to ensure reusability of code in a software project? Elaborate on code reuse operational and technical challenges.**   * Many techniques have evolved to reduce the labor intensive nature of writing source code. * Software code reuse is one such technique. * Making a block of source code to create a functionality or general utility library and using it at all places in the source code wherever this kind of functionality or utility is required is an example of code reuse.      * Code reuse in procedural programming techniques is achieved by creating special functions and utility libraries then using them in the source code. * In object-oriented programming, code reuse is done at a more advanced level. * The classes containing functions and data themselves can not only be reused in the same way as functions and libraries but the classes can also be modified by way of creating child classes and using them in the source code (Figure above – Code reuse methods). * Apart from creating and using libraries and general purpose classes for code reuse, a more potent code reuse source has evolved recently. * It is known as “service oriented architecture” (SOA). | **12** | | **2** | | **3** | **2** | **2.7.1** |
|  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | CO1 | *3* | *2* | *1* |  |  |  |  |  | *2* | *2* | *3* | *2* |
| 2 | CO2 | *3* | *2* | *2* | *2* | *3* |  |  |  | *2* | *1* | *1* | *2* |
| 3 | CO3 | *3* |  | *3* |  | *3* |  |  |  | *3* | *1* | *1* | *2* |
| 4 | CO4 |  | *2* |  |  | *2* |  |  | *2* | *3* | *2* | *1* |  |
| 5 | CO5 |  |  |  |  |  | *2* | *1* | *1* |  | *3* | *2* |  |

| **Part – A (Answer All Questions) 10 \* 1 = 10 Marks** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No** | **MCQ** | **Marks** | **BL** | | **CO** | | **PO** | **PI Code** |
| **1** | **In general, software \_\_\_\_\_\_are in the form of activity diagrams, use cases, prototypes**  **A. requirements**  **B. design**  **C. source code**  **D. test case document**  **ANSWER: B** | **1** | **1** | | **2** | | **1** | **1.3.1** |
| **2** | **The feature of the object-oriented paradigm which helps code reuse is**  **A. object**  **B. class**  **C. inheritance**  **D. aggregation**    **ANSWER: C. Inheritance** | **1** | **2** | | **2** | | **1** | **1.6.1** |
| **3** | **Cohesion is a qualitative indication of the degree to which a module**  **A. can be written more compactly**  **B. focus on just one thing**  **C. Is able to complete its function in a timely manner**  **D. Is connected to other modules**  **ANSWER:B** | **1** | **2** | | **2** | | **2** | **1.6.1** |
| **4** | **What is the most common cause of refactoring problems?**  **A. The code itself**  **B. A lack of expertise**  **C. A lack of proper tools**  **D. The fact that it doesn’t work**  **ANSWER: C** | **1** | **1** | | **2** | | **2** | **2.7.2** |
| **5** | **A three-layer design architecture model that decouples the user interface from the WebApp functionality and information content is**  A. Navigation semantic units  B. MVC architecture  C. Content architecture  D. WebApp architecture  **ANSWER: B** | **1** | **2** | | **2** | | **2** | **2.7.2** |
| **6** | **CASE and modeling tools are used for**  **A. Code Generation**  **B. Code framework**  **C. Code testing**  **D. Configuration Management**  **ANSWER:A** | **1** | **1** | | **3** | | **4** | **3.5.1** |
| **7** | **Which of the following firms is working to develop an automatic code generation system?**   1. **Sun Microsystems** 2. **HP** 3. **IBM** 4. **Dell**   **ANSWER: A** | **1** | **1** | | **3** | | **5** | **5.4.1** |
| **8** | **Which of the following is not an advantage of software reuse?**   1. **lower costs** 2. **faster softwareDevelopment** 3. **high effectiveness** 4. **lower risks**   **ANSWER:C** | **1** | **1** | | **3** | | **2** | **1.6.1** |
| **9** | **When version control management is not properly managed then many \_\_\_\_\_\_ would end up handling incorrect version of source code then may result in a huge rework at the end. (S3.9)**  **A. Presales**  **B. Tester**  **C. Designer**  **D. Developer**  **ANSWER: D** | **1** | **1** | | **3** | | **1** | **1.3.1** |
| **10** | **\_\_\_\_ is a technique where one developer writes the code and other developer sits behind him then guides him through the requirements.**  **A. Automatic code generation**  **B. Software code reuse**  **C. Pair programming**  **D. Test driven development**  **ANSWER: C** | **1** | **1** | | **3** | | **1** | **1.3.1** |
| **Part – B (Answer Any Four Questions) 4 \* 4 = 16 Marks** | | | | | | | | |
| **11** | **List out five mandatory constraints for navigation modeling.**  **Answer:**  **•**  Should certain elements be emphasized to force users to navigate in their direction?  • How should navigation errors be handled?  • Should navigation to related groups of elements be given priority over navigation to a specific element.  • Should navigation be accomplished via links, via search-based access, or by some other means?  • Should certain elements be presented to users based on the context of previous navigation actions? | **4** | **2** | | **2** | | **2** | **2.1.2** |
| **12** | **List down the characteristics of a good software design and brief any one with an example. Characteristics of a good design**   * **Open architecture** * **Modularity** * **Robustness** * **Security** * **Scalability** * **Simplicity**   **Any one of the above to be briefed with an example** | **4** | **1** | | **2** | | **3** | **3.5.1** |
| **13** | **Illustrate the bottom up approach in software design methods**  **. •**In the bottom-up approach, first, the minute functions of the software product are structured and designed.  •Then, the middle-level components are designed, and, finally, the top-level structure is designed.  •Once some components are designed, they can be shown to the customer, and a buy in can be made for the project. | **4** | **2** | | **2** | | **3** | **3.6.1** |
| **14** | **Summarize the concept of Pair programming and its advantages in software engineering.**   * Pair programming is a quality driven development technique employed in the eXtreme Programming development model. * Here, each development task is assigned to two developers. * While one developer writes the code, the other developer sits behind him and guides him through the requirements (functional, nonfunctional). * When it is the turn of the other developer to write the code, the first developer sits behind him and guides him on the requirements. * So developers take turns for the coding and coaching work. * This makes sure that each developer understands the big picture and helps them to write better code with lesser defects. | **4** | **2** | | **3** | | **2** | **3.5.1** |
| **15** | **What is the difference between content architecture and web app architecture?** | **4** | **1** | | **3** | | **2** | **1.3.1** |
| **Part – C (Answer All Questions) 2 \* 12 = 24 Marks** | | | | | | | | |
| **16** | * There are four different content structures: * • Linear Structures * • Grid Structures * • Hierarchical Structures * • Networked or “pure web” Structures |  |  | **2** | | **2** | **3** | **3.8.3** |
| OR | | | | | | | | |
| **17** | **Draw use case diagram and two interaction diagrams for coffee vending machine (The coffee vending machine is a** [**vending machine**](https://en.wikipedia.org/wiki/Vending_machine) **that dispenses hot** [**coffee**](https://en.wikipedia.org/wiki/Coffee) **and other coffee beverages).**    **Use case Diagram**      **Sequence Diagram** | **12** | | **3** | | **2** | **3** | **3.3.2** |
|  | | | | | | | | |
| **18** | **Explain the various Software code reuse methods and gives the reasons of using coding methods.**  **• The classes containing functions and data themselves can not only be reused in the same way as functions and libraries but the classes can also be modified by way of creating child classes and using them in the source code (Figure below – Code reuse methods).**  **• Apart from creating and using libraries and general-purpose classes for code reuse, a more potent code reuse source has evolved recently.**  **• It is known as “service-oriented architecture” (SOA).** | **12** | | **3** | | **3** | **3** | **3.8.3** |
| OR | | | | | | | | |
| **19** | **Compare and contrast Reviews, Deskchecks, Walkthroughs and Inspections.**  **Each 3 marks**  **Reviews – Deskchecks (Peer Reviews)**  **• Deskchecks are employed when a complete review of the source code is not important.**  **• Here, the developer sends his piece of code to the designated team members.**  **• These team members review the code and send feedback and comments to the developer as suggestions for improvement in the code.**  **• The developer reads those feedbacks and may decide to incorporate or to discard those suggestions.**  **• So this form of review is totally voluntary.**  **• Still, it is a powerful tool to eliminate defects or improve software code.**  **Reviews – Walkthroughs**  **• Walkthroughs are formal code reviews initiated by the developer. The developer sends an invitation for walkthrough to team members.**  **• At the meeting, the developer presents his method of coding and walks through his piece of code.**  **• The team members then make suggestions for improvement, if any.**  **• The developer then can decide to incorporate those suggestions or discard them.**  **Reviews – Code Reviews**  **• Code reviews are one of the most formal methods of reviews. The project manager calls for a meeting for code review of a developer.**  **• At the meeting, team members review the code and point out any code errors, defects, or improper code logic for likely defects. An error log is also generated and is reviewed by the entire team.**  **Reviews – Inspections**  **• Code inspections are final reviews of software code in which it is decided whether to pass a piece of code for inclusion into the main software build.** | **12** | | **3** | | **3** | **4** | **1.3.1** |
|  |  |  |  |  |  |  |  |  |

**Course Outcome (CO) and Bloom’s level (BL) Coverage in Questions**

**SRM Institute of Science and Technology**

**Faculty of Engineering and Technology**

**School of Computing**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

**Academic Year: 2021 -2022 EVEN**

**Course Code & Title: 18CSC206J Software Engineering. & Project Management**

**Year & Semester:** **II / IV**

**SET 4 Cycle Test 2 DATE: 1 June 2022**

**Course Articulation Matrix:**

| S. No. | Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | P10 | P11 | P12 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | CO1 | *3* | *2* | *1* |  |  |  |  |  | *2* | *2* | *3* | *2* |
| 2 | CO2 | *3* | *2* | *2* | *2* | *3* |  |  |  | *2* | *1* | *1* | *2* |
| 3 | CO3 | *3* |  | *3* |  | *3* |  |  |  | *3* | *1* | *1* | *2* |
| 4 | CO4 |  | *2* |  |  | *2* |  |  | *2* | *3* | *2* | *1* |  |
| 5 | CO5 |  |  |  |  |  | *2* | *1* | *1* |  | *3* | *2* |  |

| **Part – A (Answer All Questions) 10 \* 1 = 10 Marks** | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q. No** | **MCQ** | **Marks** | **BL** | | **CO** | | **PO** | **PI Code** |
| **1** | **\_\_\_\_\_\_\_\_increases software code reuse and enhances productivity of developers**  A.Modularity  B.Simplicity  C.Clarity  D.Relability  **ANSWER:**A.**Modularity** | **1** | **3** | | **2** | | **3** | **3.6.2** |
| **2** | **Which of the following tasks is not part of configuration management**  **A. Change Control**  **B. Reporting**  **C. Statistical quality Control**  **D. Version Control**  **ANSWER: C. Statistical quality Control** | **1** | **1** | | **2** | | **3** | **2.6.2** |
| **3** | **Navigation design belongs to which Design model element?**  **A. Component**  **B. Architecture**  **C. Deployment**  **D. Interface**  **ANSWER: D** | **1** | **2** | | **2** | | **2** | **1.6.1** |
| **4** | **Choose the which of the following characteristics should not be used to assess the quality of a webapp**  **A. Aesthetics**  **B. Reliability**  **C. Maintainability**  **D. Usability**  **ANSWER:A** | **1** | **2** | | **2** | | **1** | **1.7.1** |
| **5** | **-------------- Architecture is applied when input data are to be transformed through a series of computational or manipulative components into output data.**  **A. Object-oriented**  **B. Datacenter**  **C. Data flow**  **D. Call & return**  **ANSWER: C** | **1** | **1** | | **2** | | **3** | **3.6.1** |
| **6** | **Consider the following example, and classify it in the appropriate way: "A pattern-matching system that was built as part of a text-processing system may be utilized in a database management system."**  **A. Application system reuse**  **B. Component reuse**  **C. Object and function reuse**  **D. Product reuse**  **Answer: B** | **1** | **1** | | **2** | | **2** | **1.6.1** |
| **7** | **COTS stands for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?**  **A. Commercial Off-The-Shelf systems**  **B. Commercial Off-The-Shelf states**  **C. Commercial Off-The-System state**  **D. None of the mentioned**  **ANSWER: A. Commercial Off-The-Shelf systems** | **1** | **1** | | **3** | | **1** | **1.6.1** |
| **8** | **This enables programmers to store large pieces of code inside procedures and functions**  **A. Object Oriented Programming**  **B. Structured Programming**  **C. Pair Programming**  **D. Code reuse**  **ANSWER:B** | **1** | **1** | | **4** | | **4** | **1.6.1** |
| **9** | **Which among the following firms is working to develop an automatic code generation system?**  **A. Sun Microsystems**  **B. HP**  **C. IBM**  **D.Dell**  **ANSWER: A** | **1** | **1** | | **3** | | **5** | **5.4.1** |
| **10** | **Identify the following, this is intended to ensure that system evolution is a managed process and that priority is given to the most urgent and cost-effective changes**  **A. Release Management**  **B. system building**  **C. Version management**  **D. Change management**  **ANSWER: D. Change management** | **1** | **2** | | **3** | | **3** | **3.6.1** |
| **Part – B (Answer Any Four Questions) 4 \* 4 = 16 Marks** | | | | | | | | |
| **11** | **Discuss configuration model for web based application.**  **Answer:**  **Configuration Model**  **• Server-side**  **– Server hardware and operating system environment must be specified**  **– Interoperability considerations on the server-side must be considered**  **– Appropriate interfaces, communication protocols and related collaborative information must be specified**  **• Client-side**  **– Browser configuration issues must be identified**  **– Testing requirements should be defined** | **4** | **2** | | **2** | | **2** | **2.1.2** |
| **12** | **Who is responsible for configuration management? Brief.**  Project Manager – will produce the Configuration Management Plan and include it within the Project Management plan. Responsible for ensuring all who work on the project are aware of the Configuration Management Plan and understand how the plan works. | **4** | **2** | | **2** | | **2** | **2.1.2** |
| **13** | **What are the steps involved in User-Interface Design?**  **1. Using information developed during interface analysis, define interface objects and actions (operations).**  **2. Define events (user actions) that will cause the state of the user interface to change. Model this behavior.**  **3. Depict each interface state as it will actually look to the end user.**  **4. Indicate how the user interprets the state of the system from information provided through the interface.** | **4** | **2** | | **2** | | **2** | **2.7.1** |
| **14** | **Illustrate the advantages of Test-driven development.**  - Used with iteration-based projects especially with eXtreme Programming technique.  - Before developers start writing source code, they create test cases and run the tests to see if they run properly and their logic is working, hence less debugging to be done.  - Once it is proved that their logic is perfect, only then they write the source code, less time is needed.  - So here, higher overall test coverage as tests drive software development thereby leading towards better quality | **4** | **2** | | **3** | | **3** | **2.7.1** |
| **15** | **List out the problems involved in software reuse.**  **· Maintenance cost increase.**  **· Software tools require longer support.**  **· Software tools may become obsolete.**  **· “Not invented here” attitude reduces acceptance.**  **· Overhead of creating & maintaining a component library.**  **It takes time to select reusable software components.** | **4** | **2** | | **3** | | **2** | **2.7.1** |
| **Part – C (Answer All Questions) 2 \* 12 = 24 Marks** | | | | | | | | |
| **16** | **Write about any four of the software design types highlighting its need and its process.**   * A good software design not only ensures a smooth transition to the development phase but also ensures that the software product has a good shelf life during operation * Any four of these to be detailed - prototypes, design reuse, structural models, object-oriented design, systems analysis and entity relationship models   Key points: **Prototype**   * Prototyping is cheap and fast. * It also gets a buy in from customer at an early stage of the project. * If not, a full prototype of the application, a partial prototype can contribute to win over the customer. * There are many automatic code generation tools that allows to drag and drop some components on screens, and the tool generates the code and makes a working prototype of the application that can be demonstrated to the customer   **Design reuse**   * For large software products, the design can be broken into many design parts representing each module of the product. * Each of these design modules contain a lot of design information that can be represented as design components. * Many details inside these design components can be repeated inside different components.   **Structural Model**   * Most software applications are built using components. * At the bottom are the smallest units of functions and procedures in a software application. * These functions are contained within classes or packages depending on the programming language used. * Many classes together build a component. * Components in turn make modules. Modules in turn make the complete application.   **Object-oriented Design**   * It has always been difficult to represent business entities and business information flow in a software model. * With object-oriented design, this problem was solved. * Business entities are represented as objects in the object- oriented software design. * Properties of these objects are made in such a way that they are similar to the properties of the business entities. * These objects are instantiated from classes in the form of child classes.   **Systems Analysis**   * System analysis is the process of finding solutions in the form of a system designed from the inputs coming from business needs. * The fundamental question addressed in system analysis is whether a business scenario can be converted into a software application, so that the user can use the software application to do his routine business tasks.   **Entity Relationship Models**   * Entity relationship models are one of the ways to represent business entities and their relationships to each other through diagrams. * These diagrams are used for creating databases and database tables. | **12** | | **2** | | **2** | **3** | **3.6.1** |
| OR | | | | | | | | |
| **17** | **Use Case: Automatic Water Pump Controller**  **a automatic water pump controller circuit that controls the water pump motor. The motor gets automatically switched on when water in the overhead tank (OHT) falls below the lower limit. Similarly, it gets switched off when the tank is filled up. Based on this application frame the pattern, intent, behavioral model and class diagram** | **12** | | **3** | | **2** | **3** | **3.1.3** |
|  | | | | | | | | |
| **18** | **Briefly explain the Automatic Code Generation.**  **• Constructing and generating software code is very labor intensive work. So there has always been fascination about automatic generation of software code.**  **• Unfortunately, this is still a dream. Some CASE and modeling tools are available that generate software code. But they are not sophisticated. They are also not complete.**  **• Then there are business analyst platforms developed by many ERP software vendors that generate code automatically when analysts configure the product.**  **• These analyst platforms are first built using any of the software product development methodologies.**  **• The generated code is specific to the platform and runs on the device (hardware and software environment) for which the code is generated.**  **• Generally, any code consists of many construction unit types.**  **• Some of these code types include control statements such as loop statements, if statements, etc., and database access, etc.**  **• Generating all of the software code required to build a software application is still difficult.**  **• But some companies like Sun Microsystems are working to develop such a system.** | **12** | | **2** | | **3** | **3** | **3.8.2** |
| OR | | | | | | | | |
| **19** | **Categorize the various coding standards and explain its characteristics with examples.** | **12** | | **3** | | **3** | **4** | **3.6.1** |
|  |  |  |  |  |  |  |  |  |

Course Outcome (CO) and Bloom’s level (BL) Coverage in Questions