

Name:  
Enrolment No:



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, July 2020**

**Course:** Software Engineering and Project Management  
**Program:** B.Tech - CSF

**Semester:** IV  
**Time:**02 hrs.

**Course Code:**CSEG2008

**Max. Marks:** 100

| SN | Type | Question  | Options              |           |                   |           |           |           |                      |           | Points |
|----|------|---|----------------------|-----------|-------------------|-----------|-----------|-----------|----------------------|-----------|--------|
| 1  | MC   | Which of the following is not a step of the classical Waterfall software development model? (CO1) | Requirement Analysis | Incorrect | Design            | Incorrect | Testing   | Incorrect | Prototype building   | Correct   | 0.5    |
| 2  | MC   | Which of the following SDLC models truly follows the notion of "Define                            | Waterfall model      | Correct   | Prototyping model | Incorrect | RAD model | Incorrect | Agile process models | Incorrect | 0.5    |

|   |    |   |   |           |  |           |   |           |  |           |   |
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|   |    | before design" (CO1)  |   |           |  |           |   |           |  |           |   |
| 3 | MC | Which of the following statements are correct for the classical Waterfall SDLC model? (CO1)<br>(i) Very documentation oriented<br>(ii) Fixes all the requirements early<br>(iii) Can deliver software in iterative manner             | (iii) only  | Incorrect | (i) & (ii)   | Correct   | (i) & (iii)   | Incorrect | (ii) & (iii)   | Incorrect | 1 |
| 4 | MC | Which of the following statements is correct for Prototyping model of software development? (CO1)   | A separate prototype is developed for every stage of SDLC | Incorrect | A prototype is developed to understand the user requirements | Correct   | Always the initial prototype is modified to the final product | Incorrect | Every stage of the model is equivalent to a mini waterfall model | Incorrect | 1 |
| 5 | MC | A software is being developed using pipelined timebox iterations. The development lifecycle is divided into three stages. Each stage takes 3 weeks time to complete. What is the minimum time required to complete a software project | 9 weeks   | Incorrect | 3 weeks  | Incorrect | 7 weeks   | Incorrect | 21 weeks   | Correct   | 1 |

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|---|----|--|-------------------|-----------|-----------------|-----------|--------------|-----------|---------------------|-----------|-----|
|   |    | having 5 iterations?<br>(CO1)  |                   |           |                 |           |              |           |                     |           |     |
| 6 | MC | Which SDLC model's working is defined in the following statement.(CO1) "An initial prototype is built, it is demonstrated to the user and refined upto the user satisfaction to make the final product"  | Prototyping model | Incorrect | Iterative model | Incorrect | RAD model    | Correct   | Spiral model        | Incorrect | 1   |
| 7 | MC | A software has to be developed where requirements are likely to change during the development process and it needs early delivery of some of the features of the software. Which of the following models is best suited for the developmen of this software? (CO1) | Waterfall model   | Incorrect | Prototype model | Incorrect | Spiral model | Incorrect | Extreme Programming | Correct   | 1   |
| 8 | TF | Iterative development model can be termed as a sequence of waterfall models  | TRUE              | FALSE     |                 |           |              |           |                     |           | 0.5 |

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| 9  | MC | Which of the following are valid advantages of using iterativel model of software development (CO1)<br>(i) Can be implemeted when some features of the software needs to be delivered quickly<br>(ii) User feedback is available after each iteration | (i) and (ii) | Correct       | Only (i)  | Incorrec<br>t | Only (ii)  | Incorr<br>ect | None of<br>the both | Incorr<br>ect | 1   |
| 10 | MC | Which of the following statements are correct for Spiral model of Software Development?(CO1)<br>(i) It includes risk analysis<br>(ii) It is not suitable for low budget small projects  | Only (i)     | Incorrec<br>t | Only (ii) | Incorrec<br>t | (i) & (ii) | Correc<br>t   | None of<br>the both | Incorr<br>ect | 1   |
| 11 | TF | Angular dimension of the Spiral model represents the total cost of completing the current step(CO1)   | FALSE        | TRUE          |           |               |            |               |                     |               | 0.5 |

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|----|----|---|-------------------|-----------|-----------------|-----------|-----------------|-----------|------------|-----------|---|
| 12 | MC | <p>Which of the following SDLC model is best suited for development of a large software with the following conditions: (CO1)</p> <p>(i) All the requirements are known and no change is anticipated</p> <p>(ii) There is no requirement of early delivery of any feature of the software</p> <p>(iii) Proper documentation and user manuals need to be delivered along with the project</p> | Prototyping model | Incorrect | Waterfall model | Correct   | Iterative model | Incorrect | RAD model  | Incorrect | 1 |
| 13 | MC | <p>Which of the following properties should a good SRS possess (CO2)</p> <p>(i) Should work as an agreement between the user and the developer</p> <p>(ii) Should form the basis for acceptance criteria at the completion of development</p>   | (i) and (ii)      | Correct   | (i) & (iii)     | Incorrect | (ii) & (iii)    | Incorrect | (iii) only | Incorrect | 1 |

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|    |    | (iii) Should provide the all the test cases and their results  |   |           |  |           |   |           |   |           |     |
| 14 | MC | Which of the following is normally the correct sequence of steps of the software requirement process (CO2) | Requirement Analysis, Requirement Specification, Validation | Correct   | Requirement Specification, Requirement Analysis, Validation                          | Incorrect | Requirement Specification, Validation, Requirement Analysis | Incorrect | Requirement Analysis, Validation, Requirement Specification | Incorrect | 1   |
| 15 | MC | Which of the following is generally not part of the Software Requirement Analysis (CO2)                    | Understanding the current system                            | Incorrect | Interviewing the users with an aim to understand their expectation from the software | Incorrect | Get the SRS validated by the client                         | Correct   | None of the other options                                   | Incorrect | 1   |
| 16 | MC | Which of the following is not a non-functional software requirement (CO2)                                  | Availability  | Incorrect | Reliability  | Incorrect | Testability   | Incorrect | Functionability   | Correct   | 0.5 |
| 17 | MC | Which of the following is not a desired characteristic of a good SRS? (CO2)                                | Complete  | Incorrect | Consistent   | Incorrect | Unambiguous   | Incorrect | Executable  | Correct   | 0.5 |

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| 18 | MC | Which of the following are not part of the SRS document (CO2)<br>(i) Software functions<br>(ii) Assumptions (iii) Constraints (iv) Functional requirements (v) Performance requirements (v) Non-functional requirements (vi) System Requirements | (iv), (v) & (vi)   | Incorrect | (i), (ii) & (iii)  | Incorrect | (vi) only  | Incorrect | None of the other options                                      | Correct   | 1   |
| 19 | TF | A use-case can have one main scenario and multiple alternate scenarios (CO2)   | TRUE   | FALSE     |  |           |  |           |  |           | 0.5 |
| 20 | MC | Which of the following cannot be modeled in a Use-case diagram? (CO2)  | Generalization/Specialization of users                               | Incorrect | Interaction between actor and system   | Incorrect | Optional interaction   | Incorrect | Flow of data among system components                           | Correct   | 1   |
| 21 | MC | Which of the following statements best defines the Context diagram in Data flow modeling? (CO2)  | A DFD where in the whole system is represented as a single transform | Correct   | The lowest level DFD where all transforms are exploded into further child transforms | Incorrect | A DFD without any transform but containing only inputs, outputs, sources and sinks | Incorrect | A DFD containing only all the transforms but no inputs/outputs | Incorrect | 1   |

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|----|----|---|--------------|-----------|-----------|-----------|--------------|-----------|------------------|-----------|-----|
| 22 | MC | Which of the following statements are correct for data flow diagrams?<br>(i) A source/sink of data is represented by a bubble/circle<br>(ii) Movement of data is represented by arrows<br>(iii) A transform is represented by a rectangle | (i) and (ii) | Incorrect | (ii) only | Correct   | (ii) & (iii) | Incorrect | (i) & (iii)      | Incorrect | 1   |
| 23 | TF | For a use-case, an actor is always a user and never another system (CO2)  | FALSE        | TRUE      |           |           |              |           |                  |           | 0.5 |
| 24 | MC | Which of the following statements are correct for Use-cases(CO2)<br>(i) Use-cases designs may contain both text as well as diagrams<br>(ii) Use cases may have hierarchical structure where a use-case may call for another use-case      | (i)only      | Incorrect | (ii) only | Incorrect | (i) & (ii)   | Correct   | None of the both | Incorrect | 1   |
| 25 | MC | A program has 4 EIs of low type, 3 EOs of average type, 5 EQs of high type, 2 ILFs of average type and 4 EIFs of high type. All   | 117          | Incorrect | 108       | Incorrect | 125          | Correct   | 132              | Incorrect | 1   |



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|----|----|---|------------|-----------|-----------|-----------|----------|-----------|-----------|-----------|---|
|    |    | complexity adjustment factors are to be taken as average. The FP count for this program is ____ (CO4) (Select the closest value)  |            |           |           |           |          |           |           |           |   |
| 26 | MC | The development time for a project of size 200 KLOC using COCOMO Model is ____ (Select the closest value)   | 377 months | Incorrect | 29 months | Correct   | 8 months | Incorrect | 98 months | Incorrect | 1 |
| 27 | MC | The effort for a project of size 400 KLOC using COCOMO Model is _____ Person Month (Select the closest value) (CO4)   | 4773       | Correct   | 913       | Incorrect | 2215     | Incorrect | 526       | Incorrect | 1 |
| 28 | MC | A project has cashflows of - 100000, 20000, 30000, 40000, 20000, 10000 for year 0, 1, 2, 3, 4 and 5 respectively. The Payback period is ____ (Select the closest value) (CO4) | 3 years    | Incorrect | 3.5 years | Correct   | 4 years  | Incorrect | 4.5 years | Incorrect | 1 |

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| 29 | MC | A project has cashflows of - 200000, 40000, 80000, 60000, 40000, 40000 for year 0, 1, 2, 3, 4 and 5 respectively. What is the Net Present Value assuming a discount rate of 5%? (CO4) (Select the closest value) | 8700  | Incorrect | 10200 | Incorrect | 15600 | Incorrect | 26400 | Correct   | 1   |
| 30 | MC | A project has cashflows of - 200000, 20000, 60000, 80000, 80000, 10000 for year 0, 1, 2, 3, 4 and 5 respectively. What is the Return on Investment? (CO4) (Select the closest value)                             | 7.50% | Incorrect | 10%   | Incorrect | 5%    | Correct   | 2.50% | Incorrect | 1   |
| 31 | MC | A project has cashflows of - 200000, 10000, 30000, 80000, 60000, 60000 for year 0, 1, 2, 3, 4 and 5 respectively. What is the Net Profit? (CO4)  | 40000 | Correct   | 20000 | Incorrect | 80000 | Incorrect | 4000  | Incorrect | 1   |
| 32 | TF | The Benefit Measurement method of project  | TRUE  | FALSE     |       |           |       |           |       |           | 0.5 |

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|    |    | selection is applicable to small non-complex projects only   |                    |           |                  |           |                      |           |                     |           |     |
| 33 | MC | Which of the following is not a technique of benefit measurement for project selection? (CO4)  | Scoring model      | Incorrect | Opportunity cost | Incorrect | Benefit cost ratio   | Incorrect | Variable complexity | Correct   | 0.5 |
| 34 | MC | Which of the following is correct for project scope statement (i) It is finalized at the end of the project development phase (ii) It defines the project boundaries                     | Only (i)           | Incorrect | only (ii)        | Correct   | (i) & (ii)           | Incorrect | None of the both    | Incorrect | 1   |
| 35 | MC | If the Unadjusted Function Point value for a project is UFP, what can be the range of Function Point values if the impact of complexity adjustment factors in minimum to maximum ? (CO4) | 0.5*UFP to 1.0*UFP | Incorrect | 0 to 1.0*UFP     | Incorrect | 0.65*UFP to 1.35*UFP | Correct   | 0.5*UFP to 1.5*UFP  | Incorrect | 1   |
| 36 | MC | Which of the following cost benefit evaluation method takes timing of the cash flow into consideration while   | Payback period     | Incorrect | Net profit       | Incorrect | Return on investment | Incorrect | Net present value   | Correct   | 0.5 |

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|    |    | analyzing benefits (CO4)  |  |           |   |           |  |           |   |           |     |
| 37 | MC | Which of the following sets is the correct set of major Metrics categories (CO3)  | Product Metrics, Process Metrics, Person Metrics | Incorrect | Product Metrics, Process Metrics, Project Metrics | Correct   | Process Metrics, Project Metrics, Progress Metrics | Incorrect | Project Metrics, Person Metrics, Progress Metrics     | Incorrect | 0.5 |
| 38 | MC | Consider the following two statements<br>(i) Cohesion denotes the degree to which a component performs a single task<br>(ii) Coupling denotes the degree to which a component is divisible into smaller components.<br>Which of these two statements is/are correct (CO3) | Only (i)   | Correct   | only (ii)   | Incorrect | (i) & (ii)   | Incorrect | (i) is partially correct & (ii) is completely correct | Incorrect | 1   |

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| 39 | MC | Consider the following numbers of operators and operands and their occurrences in a program.<br>operator1= 3 occurrences;<br>operator2=4 occurrences;<br>operator3=5 occurrences;<br>operand1=1 occurrence;<br>operand2=3 occurrences;<br>operand3=2 occurrences;<br>What are the values of program vocabulary and program length respectively as per Halstead analysis? (CO3) | 3 & 6  | Incorrect | 6 & 12  | Incorrect | 6 & 18  | Correct   | 6 & 3   | Incorrect | 1 |
| 40 | MC | Which of the following is the correct set of McCall's Software Quality factors categories?(CO3)  | Product Development, Product Operation, Product Revision | Incorrect | Product Validation, Product Operation, Product Revision | Incorrect | Product Development, Product Validation, Product Revision | Incorrect | Product Operation, Product Transition, Product Revision | Correct   | 1 |
| 41 | MC | One of the McCall's software quality criteria is define as   | Consistency  | Incorrect | Opearbility   | Incorrect | Tracebility   | Correct   | Execution Efficiency                                    | Incorrect | 1 |

|    |    |   |   |           |   |           |   |           |   |           |     |
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|    |    | "The ability to link software to component's requirement". Which criteria is this?(CO3)                           |   |           |   |           |   |           |   |           |     |
| 42 | MC | Which of the following sets contains three of the ISO 9126 Software Quality Factors? (CO3)                        | Functionality, Portability, Testability           | Incorrect | Reliability, Efficiency, Maintainability          | Correct   | Maintainability, Usability, Profitability         | Incorrect | Efficiency, Usability, Profitability              | Incorrect | 1   |
| 43 | MC | Which of the following is the correct order of maturity levels of Capability Maturity Model? (CO3)                | Initial, Repeatable, Defined, Managed, Optimizing | Correct   | Initial, Defined, Repeatable, Managed, Optimizing | Incorrect | Initial, Managed, Repeatable, Defined, Optimizing | Incorrect | Initial, Repeatable, Defined, Optimizing, Managed | Incorrect | 1   |
| 44 | MC | Which of the following SDLC model the Capability maturity model can be implemented on to improve the process(CO3) | Waterfall model                                   | Incorrect | Spiral Model                                      | Incorrect | Extreme Programming                               | Incorrect | On all of the given options                       | Correct   | 0.5 |
| 45 | TF | ISO 9126 is a standard that standardizes Software Risk Assessment metrics(CO3)                                    | FALSE   | TRUE      |   |           |   |           |   |           | 0.5 |
| 46 | MC | Which of the following is not a Risk Assessment activity?(CO3)  | Risk Identification                               | Incorrect | Risk Analysis                                     | Incorrect | Risk Resolution                                   | Correct   | Risk Prioritization                               | Incorrect | 0.5 |

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| 47 | MC | Which of the following factors has the least chances of increasing the risk associated with a software project?(CO3)   | Frequently changing requirements   | Incorrect | Poor communication among team members           | Incorrect | Untested technical approaches                              | Incorrect | Better than expected actual cash inflows          | Correct   | 0.5 |
| 48 | MC | Usability of a software can be measured in terms of _____ (CO3)  | Understandability  | Incorrect | Learnability                                    | Incorrect | All of the given options                                   | Correct   | Operability                                       | Incorrect | 1   |
| 49 | MC | Which of the following statements are correct?(CO5)  | Mistakes in coding are called bugs   | Incorrect | A fault is a representation of an error         | Incorrect | A failure occurs when a fault executes                     | Incorrect | All of the given options                          | Correct   | 1   |
| 50 | MC | Which of the following statements are correct (CO5)  | Verification is done by reviewing the documents generated after a software development phase | Incorrect | Validation is done by executing the actual code | Incorrect | Software testing includes both verification and validation | Correct   | Validation includes both testing and verification | Incorrect | 1   |
| 51 | MC | Which of the following mappings are correct? (CO5)<br>(i) White Box Testing -> Cyclomatic Complexity<br>(ii) White Box Testing -> Equivalence Class Testing<br>(iii) Black Box Testing - | (i) only   | Incorrect | (i) & (ii)                                      | Incorrect | (i) & (iii)  | Correct   | (ii) & (iii)                                      | Incorrect | 1   |

|    |    |   |            |           |              |           |            |           |              |           |   |
|----|----|---|------------|-----------|--------------|-----------|------------|-----------|--------------|-----------|---|
|    |    | > Boundary Value Analysis   |            |           |              |           |            |           |              |           |   |
| 52 | MC | Consider two variables x & y having their values in the range (50,100) and (200, 300) respectively. Which of the following value of (x,y) is not a valid Boundary Value Analysis test case? (CO5)                         | (99, 299)  | Correct   | (75, 299)    | Incorrect | (50, 250)  | Incorrect | (99, 250)    | Incorrect | 1 |
| 53 | MC | For a software with 5 input variables, how many test cases will be generated for Boundary Value Analysis, Robustness Testing and Worst Case Testing respectively?(CO5)  | 21, 31, 25 | Incorrect | 31, 21, 3125 | Incorrect | 25, 21, 31 | Incorrect | 21, 31, 3125 | Correct   | 1 |
| 54 | MC | Consider a program having only one input variable x. If the range of this input is defined by the following set of expressions $x < a_1, a_2 < x < a_3, a_4 < x < a_5, a_6 < x$ where $a_1 < a_2 < a_3 < a_4 < a_5 < a_6$ | 4          | Incorrect | 7            | Correct   | 6          | Incorrect | 1            | Incorrect | 1 |



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|----|----|--|---------------------|-----------|----------------|-----------|-------------------|-----------|-----------------|-----------|-----|
|    |    | How many input equivalence classes are formed? (CO5)   |                     |           |                |           |                   |           |                 |           |     |
| 55 | MC | Before launching a software which testing is to be performed at the developer's site?(CO5)   | Beta                | Incorrect | Alpha          | Correct   | Gamma             | Incorrect | None of options | Incorrect | 0.5 |
| 56 | MC | Which testing phase tests individual software modules combined together as a group?(CO5)   | Integration Testing | Correct   | Module Testing | Incorrect | White-Box Testing | Incorrect | Unit Testing    | Incorrect | 0.5 |
| 57 | TF | Acceptance testing is performed by the developers of the software themselves(CO5)  | FALSE               | TRUE      |                |           |                   |           |                 |           | 0.5 |
| 58 | MC | A program has n1 nodes in its Flow Graph. The DD Flow graph of the same program has n2 nodes. Which of the following statement is always true? (CO5) | $n1=n2$             | Incorrect | $n1 \leq n2$   | Incorrect | $n1 \geq n2$      | Correct   | $n1+n2=0$       | Incorrect | 1   |
| 59 | TF | Cyclomatic Complexity is always higher than the  | FALSE               | TRUE      |                |           |                   |           |                 |           | 0.5 |

|    |    |   |   |           |    |           |    |         |    |           |   |
|----|----|---|---|-----------|----|-----------|----|---------|----|-----------|---|
|    |    | number of regions in a flow graph   |   |           |    |           |    |         |    |           |   |
| 60 | MC | Flow graph of a program has 42 edges, 36 nodes and 3 connected components. The Cyclomatic Complexity of the program is _____<br>(CO5) | 6 | Incorrect | 18 | Incorrect | 12 | Correct | 24 | Incorrect | 1 |

End of the question paper