Birla Institute of Technology & Science, Pilani
Work Integrated Learning Programmes Division
Second Semester 2022-2023

Comprehensive Examination
(EC-3 Regular)

Course No. : SE ZG544
Course Title : Agile Software Process
Nature of Exam : Open Book
Weightage : 45%
Duration : 2 ½ Hours
Date of Exam : 20/05/2023 (AN)

No. of Pages = 7
No. of Questions = 24

Note to Students:
1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
2. All parts of a question should be answered consecutively. Each answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Q.1 Set. (A) In no particular sequence, these are some of the advantages of waterfall and agile techniques. The description hints at the methodology being discussed. Choose the best approach (waterfall or agile) for each advantage. [6]
Then, what are the drawbacks of each advantage?

1. Short deadlines promote productivity and efficiency.
2. The methodology is client-facing, or the customer is a member of the team, which implies that the team communicates progress and includes consumer feedback into the process.
3. Provides a detailed project plan from conception to conclusion.
4.There is a lot of leeway in changing project directions and experimenting with new ones.
5.Early on in the project, the team defines project requirements, which can save time.
6. Each phase of the project requires a deliverable to progress to the next phase, making the workflow more structured

Q.1 Set. (B) Given the following high-level project description, which of the following projects is most suited to the adaptive technique and which to the predictive method? [6]

1. A medical diagnostics app that requires frequent user feedback to fine-tune the app.
2. Projects requiring a high level of oversight and/or accountability, such as those in banking, healthcare, and nuclear facility control systems.
3. Money and time are secondary considerations; what matters most is the project's safety and stability.
4. A project that necessitates regular progress updates with business owners and stakeholders.
5. A project owner has a clear and specific vision for an app that he or she is confident will not change during the project's development.

6. A project with a fixed (Time, Cost, Scope) bid and a team of four people developing a mobile app
7.A project with deliverables that change frequently, such as technology products.
8. A project that evolves or does not begin with a clear scope and requirements
9. A project emphasizes process and product improvement and requires a method for continuous progress.
10.A project must adhere to strict guidelines because each phase requires deliverables before moving on to the next.
11. A project that is experimenting with direction and has no idea how the final project will look before it begins.
12 A distributed team developing medically regulated hardware.

Q.1 Set. (C) Assume you are a real estate developer building a 100-unit housing project. Consider each house to be a "feature" (a smallest unit high fidelity delivery), and "releasing a feature" refers to its release to the client. In terms of house delivery, how would each of the agile, iterative, incremental, and predictive techniques relate to home sales? Which techniques are likely to succeed? What methods do real estate developers use? [6]

Q.2 Set. (A) Which of the following descriptions best describes a project? [6]

1. Building a new house
2. Developing a new software application
3. Performing an assessment of current manufacturing processes
4. Improving an organizational business process
5. Writing a book
6. Relocating a company's technology infrastructure to a new location or to a cloud platform
7. Merging two organizations
8. Developing a new medical device.
9. Performing accounts receivable and accounts payable activities
10. Executing daily manufacturing orders
11. Performing recommended equipment maintenance procedures
12. Conducting customer account maintenance

Q.2 Set. (B) A self-organizing Agile Team has the ability to choose how it accomplishes its work. In practice, how does this team behavior present itself in a variety of ways during a sprint? Make a list of at least six ways. [6]

Q.2 Set. (C)

Q. 2.1 "Working Software Is the Primary Measure of Progress," says one Agile principle. Why is it difficult and problematic to measure progress on a software development project using the Waterfall method? How does the Agile method attempt to address this? [3]

Q. 2.2 Product backlog grooming is an important stage in the Scrum process that is not reflected directly in the Scrum framework diagram. Who are the meeting's attendees, and mention at least four meeting outcomes? [3]

Q.3 Set. (A) Which of these situations illustrates using Agile principles and which illustrates using Agile practices? Justify and explain your response. [3+3]

1. The team is aware that having a face-to-face discussion with her team is the most efficient way to convey crucial information about the project.
2. The team use incremental design to ensure that the code they create is simple because they are aware that users may change their minds in the future and that these changes may have a negative impact on their code.
3. Because the team is aware that they will build software more effectively if they have a better understanding of the users, The team uses a persona to represent a typical user.
4. Since working software is the best way to demonstrate the team's progress to stakeholders, the team always makes sure that they are working on something that they can show them.
5. The team wants to improve the way the team builds software by getting everyone to improve collaboratively and evolve experimentally by coming up with changes to their process that they can all make together and using data to see if those changes made things better.
6. The team embraces change by writing code that is simple to modify in the future.

Q.3 Set. (B)

Q. 3.1 Assuming one-week iterations and a team of four developers, how many iterations will it take the team to complete a project with 27 story points if they have a velocity of 4? A story estimated at one story point actually took two days to complete. How much does it contribute to velocity when calculated at the end of the iteration? [2]

Q. 3.2 These are a few examples of agile principles, practices, and concepts. Which of these are derived from Scrum, XP, and Lean, and what traits do Scrum, XP, and Lean share in common? [4]

1. Commitment, 2. Eliminate Waste, 3. Deliver as Fast as Possible, 4. Last Responsible Moment 5. Openness, 6. Courage, 7. Simplicity, 8. Respect, 9. Empower the Team (Whole Team) 10. Amplify Learning (Feedback, Iterations), 11. Energized Work (Focus) 12. Build Integrity In, 13. See the Whole

Q.3 Set. (C) Teams utilize the ‘5-Whys’ technique to uncover the root cause of a problem by asking a series of 'why' questions. Consider a scenario in which the production site is unavailable for two days, causing significant disruption. Create a list of 5 'Why' questions and a pertinent response for each question to find the cause of the issue. [6]

Q.4 Set. (A) Agile teams invest in a variety of ways in order to spread knowledge among themselves. List and briefly describe at least 12 different occasions in which Agile teams share expertise with their peers. [6]

Q.4 Set. (B)

Q. 4.1 Answer the following questions: [4]

1. At which phase of the Agile project is Risk planning done?
2.Product parts are often subject to damage during shipment, which causes a high level of impact on the customer. To manage the risk, the project team insures all shipments. This risk response is a good example of:
3.Errors missed by quality assurance and control process and released to the end user are:

4.An approach where testers perform minimum test planning and maximum test execution is known as:
5. Frequently integrating new and changed code is known as:
6. During a problem detection session, you ask WHY five times because:
7. The formula for risk severity is:
8.Steps to perform while using TDD technique:

Q. 4.2 Assume you are creating a library management system. You intend to conduct exploratory testing. Create four exploratory test scenarios that you might want to run. [2]

Q.4 Set. (C)

Q. 4.1 A few examples of situational issues are provided below. In each situation, what is your best course of action? [3]

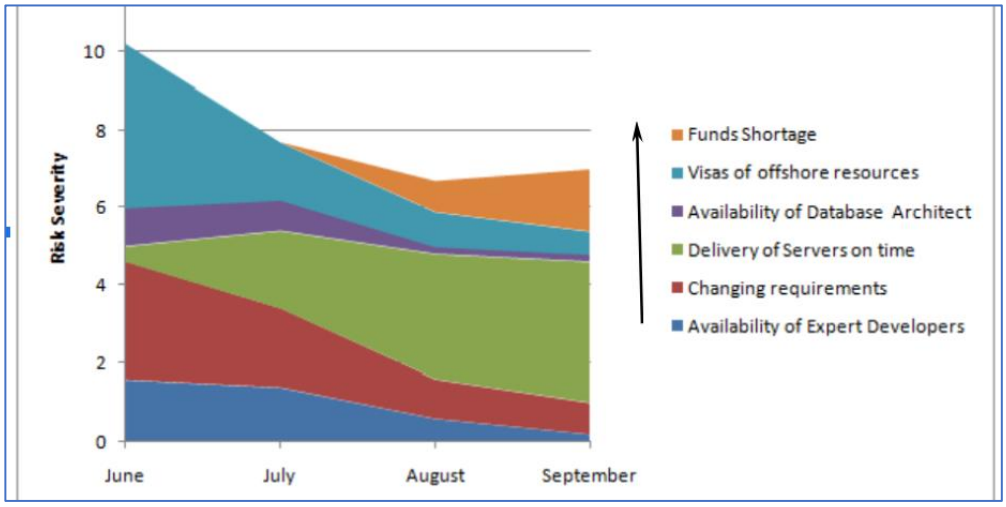
1. Your team committed to delivering 20story points this iteration, but it looks like you will only complete 14. You should:
2. You are leading a team with an average velocity of 85 points per iteration. Another team of the same size in your organization is working on a different project with similar complexity. The other team's velocity is averaging 125 points per month. Your team should:
3. During a planning poker session, participants come up with estimates of 5, 8, 13, 38, 5 and 5 respectively during the first round for a particular story. What should the facilitator advise?

Q. 4.2 Create three acceptance criteria for the user story below. Each criterion should have a yes/no or pass/fail response. [3]

As a library user, I want to check the availability of a novel and reserve it, so that I can read it during my leisure time.

Q.5 Set. (A)

Q. 5.1 What exactly is this graph and what does it serve? What can you learn or identify issues from this graph, and what are the likely causes? [4]



Q. 5.2 How long is the Agile feedback cycle, which includes continuous integration, pair programming, unit testing, sprint reviews, in-person customer interaction, and release? [2]

Q.5 Set. (B)

Q. 5.1 What kind of risk response strategy does a Spike story provide? How does the spike's outcome benefit the team in various ways? Make a list of at least four outcomes. [4]

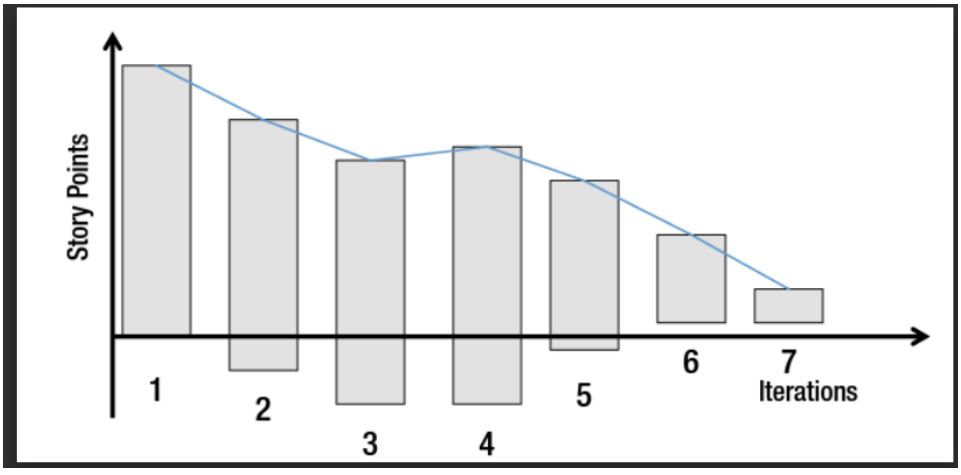
Q. 5.2 The product features are divided into four categories. Which features will you prioritize delivering first, second, and third? Which features should you avoid delivering? [2]

1. Low Risk, High Value features.
2. Low Risk, Low value features
3. High Risk, High value features
4. High Risk, Low value features.

Q.5 Set. (C) What risk response strategy are you employing in the following scenarios? [6]

1. Investigate contracting options if skilled resources are unavailable.
2. Educate the resources on the new skills.
3. Using open-source software and reducing reliance on vendor software
4. Restoring the previous version of the web portal because the upgraded user registration process is inconvenient.
5, Continue to cross-train the team and look for replacements due to high attrition.
6. Investment behind redundant storage disks and backup infrastructure
7. Outsourcing of work to a third-party service provider using a fixed price contract
8. Project that is on the verge of missing its deadline, extending the deadline or reducing the scope of the project

Q.6 Set. (A) Explain the release burndown chart below, from Iteration 1 to Iteration 7. How do you interpret each bar graph, line graph, and iteration's scope? [6]



Q.6 Set. (B) In various projects, you have encountered the following situations. Based on these parameters, you must select a Sprint length of 2 weeks or 6 weeks. What is your preferred sprint length for each situation, and why do you like it that way? [4+2]

1. Releases are more frequent
2. There is high overhead in iterating

3. Priorities and requirements do not change very often
4. You have strong need to maintain focus and sense of urgency

Q.6 Set. (C)

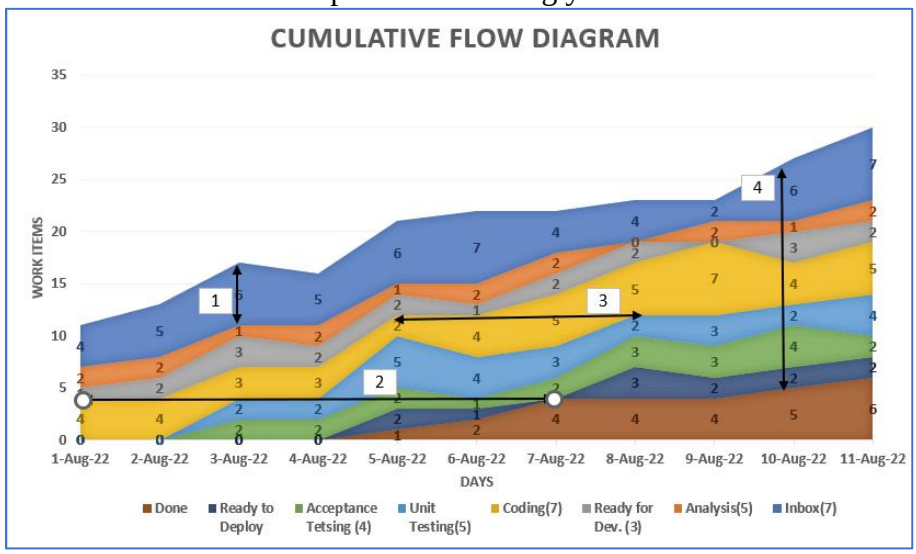
Q. 6.1 Assume you've been tasked with developing library management systems. Create a product roadmap that spans four quarters. [3]

Q. 6.2 The just-in-time (JIT) planning approach is used by agile methodologies. Provide three examples of Agile practices that use JIT planning. [3]

Q.7 Set. (A) MoSCoW is a requirement management prioritization technique. This abbreviation stands for "Must have (Mo), Should have (S), Could have (Co), and Won't have (W)." The requirements for a familiar object or thing that we use every day are listed below. Using the MoScoW technique, prioritize the following requirements.[6]

1. A mobile phone is to be able to play music, click photos, or help with GPS navigation.
2. A mobile phone is the ability to make and receive calls and an address book to store the list of contacts.
3. A mobile phone is the ability to connect to a data network and being able to browse the Internet.
4. A mobile phone could be used to act as a pedometer that counts steps for a morning jogger.
5. Being able to toggle the channel or volume buttons on a TV remote
6. Being able to search for a book from our library management system.

Q.7 Set. (B) A Kanban board's cumulative flow diagram is shown below. The Kanban system Columns are shown below the X-axis, and the WIP value is shown between the brackets. The first column, 'Inbox,' is on the right, and the 'Done,' is on the left, and they correlate to color from top to bottom along y-axis. [4+2]



Q. 7.1 Each label from 1 to 4 on the arrow's side represents a measure. What exactly are these measures?

Q. 7.2 Were you able to identify any potential bottlenecks in this project? If so, what are the bottlenecks?

Q.7 Set. (C)

Q. 7.1 What exactly is 'Technical Debt'? Agile teams understand the importance of striking a balance between feature development and reducing the complexities caused by technical debt. Which practices will aid in the reduction of 'Technical debt'? [3]

Q. 7.2 "Businesspeople and developers must work together daily throughout the project," according to one of the Agile principles. However, the Agile team faced the following challenges. How does the Agile team plan to overcome them? [3]

Communication challenges:

The Agile team and business may not be co-located. This is a realistic problem where:

1. A software is being built to serve multiple lines of business, often at various geographical locations.
2. The software has many components that are being codeveloped by developers based out of multiple locations, often in different time zones.
3. The business people might have limited availability and their 'daily' meeting commitment may not be fulfilled.

Q.8 Set. (A) The daily standup meeting is usually limited to three questions that each team member must answer. Taking this goal into account, which of the following are valid and incorrect topics discussed during daily standup meetings, and why? [3]

1. Our new contractor can't start because no one is here to sign the contract.
2. The department manager has asked me to work for another team for the remaining week.
3. I tested story number 10 yesterday.
4. I'm struggling to learn C++ and would like to pair with someone on it.
5. I can't get the product owner to show up or call me back.
6. You explain why a team member should be removed from the team.

Q.8 Set. (B) Give an example for at least one measure that you would define, if you were a customer, a team member, or a management member. For each measure define its purpose and how it would help you improve performance. Describe specific scenarios in which these measures would be helpful. [3]

Q.8 Set. (C) Suggest examples of measures that should be taken several times a day, on a daily basis, and on an iteration basis. Specify the purpose of each measure. [3]