Birla Institute of Technology & Science, Pilani
Work Integrated Learning Programmes Division
Second Semester 2021-2022

Comprehensive Examination
(EC-3 Regular)

Course No. : SE ZG 544
Course Title : Agile Software Process
Nature of Exam : Open Book
Weightage : 45%
Duration : 2 Hours
Date of Exam : 21/05/2022 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) A two-week iteration is being worked on by an Agile team. As a team member , you have been told to concentrate on "first things first." Arrange the following activities into the four quadrants listed below. Which quadrant should you concentrate on? [6]

Q1.Urgent and Important	Q2.Not Urgent but Important
Q3.Urgent but Not Important	Q4.Not Urgent and Not Important

1. Design 2. Fixing bugs that prevent progress 3. Iteration planning 4. Learning new technologies 5. Working on management assignments that arrive late and have tight deadlines 6. Refactoring 7. Tracking|follow-up and control	8. Preparing a presentation after it has been postponed till the last minute 9. Personal arrangements/errands 10. Production problems 11. Helping other team members with urgent tasks 12. Mingling 13. Testing

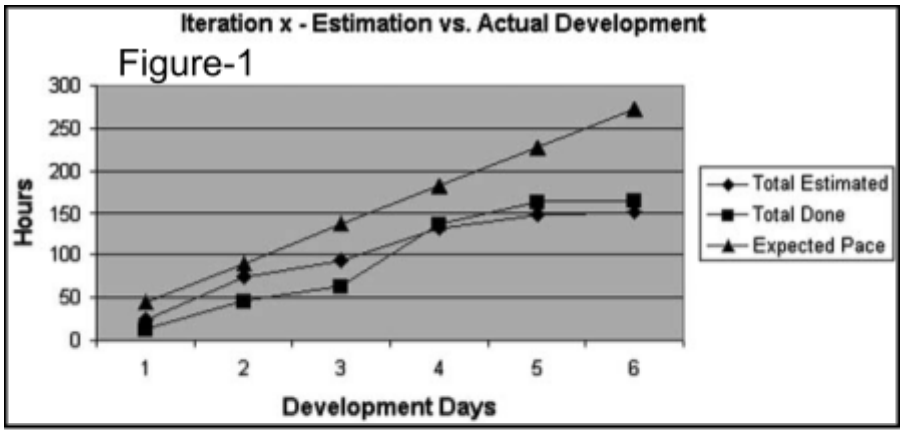
Q.1 Set. (B)

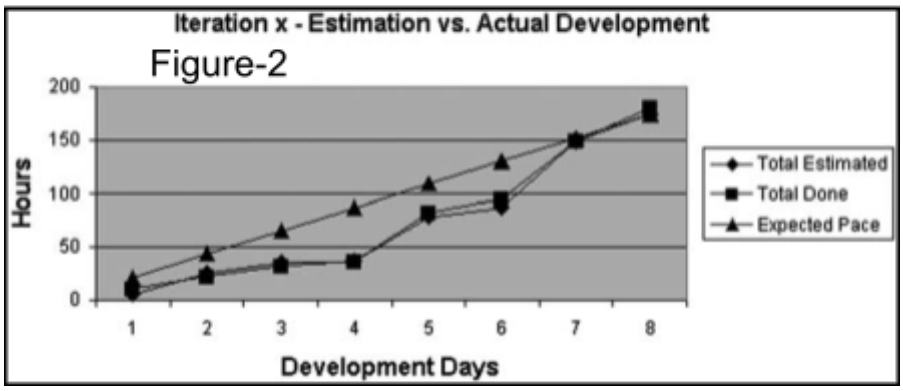
Q.1.1 What do you mean by "sustainable phase" and why do you think it's important to retain it? [2]

Q.1.2 How an Agile team plans their development day (9am-6pm) taking into account the sustainable phase of development in nine work hours each day. However, we all know that in order to overcome a temporary stumbling block or deal with an emergency situation, extra effort is sometimes required. [4]

Q.1 Set. (C) The graphs below show three different graphs: For a certain Scrum team , the “expected pace” is the average available time each day for the iterations defined by the iteration scope.. The total time spent on iteration “done” activities is referred to as "total done." The total projected effort for a given day is the “total estimated”.During

the iteration, the product owner does not add any new stories.The agile team is accurate in its estimations.





Q.1.1 Figure.1 shows that there is a large disparity between the allocated time for development (about 270 hours) and the time that was actually spent on development. List at least three possible causes of this gap. [3]

Q.1.2 How do you compare Figures 1 and 2? What could be the cause of the abrupt increase in slope of the graph in Figure.2? [3]

Q.2 Set. (A) Choose three agile techniques that have an impact on process quality and three others that have an impact on product quality. Describe briefly how each of these has an impact on process and product quality. [6]

Q.2 Set. (B) What are the differences between agile and other methods with respect to quality in terms of: [6]

Quality Related Aspect	Agile Approach	Some other Approach
1. Who is responsible for software quality?		
2. When are quality related topics addressed?		
3. Quality-related activities status		
4. Work style		
5. Quality Documentation		
6. Defect tracking		

Q.2 Set. (C) These are the issues or challenges associated with testing in the Waterfall approach of software development. Explain how TDD can help overcome the above challenges. [6]

1. Insufficient time for unit tests.
2. Negative feedback or developers that are dissatisfied with the discovery of defects in their code
3. Testing is handed on to someone else.
4. Developers take into account testing is regarded as a low-status job.
5. Managers believe that development takes longer and is more difficult to manage.
6. Testing is difficult-suitability may be a concern.

Q.3 Set. (A) Identify six agile techniques and explain how they improve transparency in the process. How can process openness help team members trust each other? [6]

Q.3 Set. (B) When doing a retrospective in an agile software development environment, agile retrospective methods and principles should be used and promoted. Explain how the Agile practices : Whole team, time box, measures, abstraction, diversity and Agile games may be used in a retrospective. [6]

Q.3 Set. (C)

Q.1.1 Choose the relevant sprint retrospective subjects from the list below. [3]

1. Personal quarrels and accusations
2. Relevant to the entire team
3. Technical problems
4. Organizational issues
5. High (external) management initiatives
6. Issues not everyone agrees on

Q.1.2 What are your thoughts on the following retro procedure? What are the benefits and drawbacks of the following rretrospective procedures, if any? [3]

1. Only one specific problem is discussed at each retrospective meeting.
2. The problem discussed should relate to the development process, not the developed product.
3. The retrospective cannot exceed one hour.
4. Team members are encouraged to speak their own opinions.
5. Retrospective meeting is held at the development site.
6. Only members of the team are invited to the retrospective meeting.

Q.4 Set. (A)

Q.1.1 The following are some of Scrum's characteristics: Discipline, Three major roles and Quality. How do you back these claims? [2]

Q.1.2 Scrum has a number of strengths:Prioritized delivery,Non-prescriptive on practices performed during a sprint,Demonstrated success across the software industry,Status transparency,Team accountability,Continuous delivery. How do you back these claims? [4]

Q.4 Set. (B)

Q.1.1 Adapting to new conditions happens throughout an iteration and after the iteration review by the customer. Here are a few frequent issues that may arise during the development process. What is your approach to dealing with these difficulties in an Agile project? [3+3]

Adapting during an iteration:

1. A change in user story scope
2. A technical constraint is discovered
3. A team member is unavailable

Adapting at the end of Iteration review:

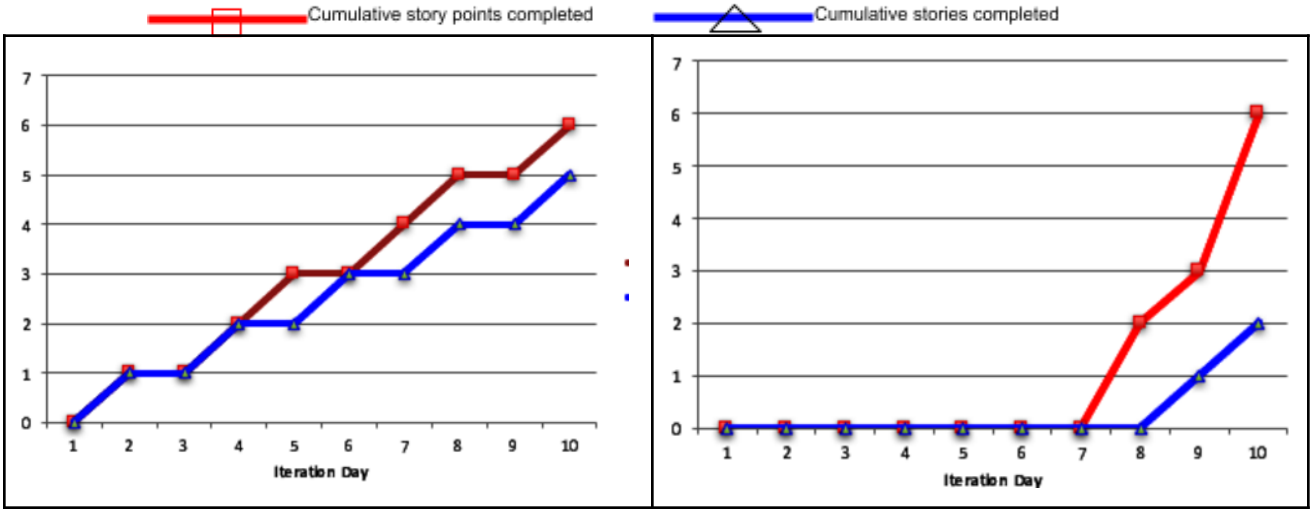
It is required to revisit/review the following items.

1. Re-evaluating priorities-the tradeoff matrix indicates that the schedule is fixed,light flexibility with their resources and high flexibility with scope.
2. Team performance and velocity
3. Release plan

Q.4 Set. (C)

Q.1.1 What are the advantages of utilizing story counts instead of story points for the estimation ? [2]

Q.1.2 Below is a burn-up of two very comparable Agile teams' charts. How would you compare these two teams' progress based on these charts, both the teams completing the same number of story points? Which team is more successful, and why? [4]



Q.5 Set. (A)

The product backlog has been prioritized at an estimated 200 points. The team's sprint velocity has been determined to be 15 to 20 points per sprint. The team runs sprints every two weeks. The first sprint will conclude on June 22nd. The deadline for the release has been set for November 15th, 22.

Q.1.1 How many storey points do you think you'll be able to finish by the deadline using low and high velocity? [4]

Q.1.2 In this scenario, how should the Product backlog have been organized? What is your degree of confidence in completing the sprints based on this? [2]

Q.5 Set. (B)

The product backlog has been prioritized and estimated at 200 points. The team's sprint velocity has been determined to be 15 to 20 points per sprint. The team runs sprints every two weeks. The first sprint will conclude on June 22nd. The deadline for the release has been set for November 15th, 22.

Suppose, though, that in the first sprint, the team accomplished 11 story points rather than the 15 to 20 it had estimated. The team updated the release plan to reflect this actual velocity, then the team ran five more sprints, each time updating the release plan. By the

end of sprint 6, the team had an observed velocity range of 8 to 14 points, with an average of 11.

Q.1.1 How many storey points do you think you'll be able to finish by the deadline using low and high velocity? A. After Sprint 1, B.After Sprint 6. [3+3]

Q.5 Set. (C)

The product backlog has been prioritized and estimated at 200 points. The team's sprint velocity has been determined to be 15 to 20 points per sprint. The team runs sprints every two weeks.

Suppose, though, that in the first sprint, the team accomplished 11 story points rather than the 15 to 20 it had estimated. The team updated the release plan to reflect this actual velocity, then the team ran five more sprints, each time updating the release plan. By the end of sprint 6, the team had an observed velocity range of 8 to 14 points, with an average of 11.

Q.1.1 How many story points do you think you'll be able to finish if the available budget is $200000 and the cost per Sprint is $20000 using low and high velocity?

A. After Sprint 1, B.After Sprint 6. [3+3]

Q.6 Set. (A) The agile methodology is used to deliver the majority of projects in the IT industry and elsewhere. Fill in the Agile values from Agile Manifesto in the table below. Relevance/Benefits to the IT and non-IT worlds, as well as the tools/practices used by the Agile team (local or remote) to put these values into action. [6]

Agile Values	Relevance	Tools

Q.6 Set. (B)

Q.1.1 Make a Kanban board for a project, using the following workflow stages: [2]

Stage	Average effort spent	
	Ready	In-Progress
Development	1 day	3 days
Review	0.5 day	0.5 day
Testing	0.5 day	1 day
Deployment	0.5 day	0.5 day

The “In-Progress” stage is value added (VA) effort and the “Ready” stage is non-value (NVA) added effort.

Q.1.2 Calculate the WIP for each VA stage using the following formulae. [4]

The formula for calculating WIP is : WIP = Total Tasks * Time %

Total Tasks = Team Size / Overall Efficiency

Time % = VA for the Stage/Sum of all VAs.

Team Size = 5.

Q.6 Set. (C)

Q.1.1

Group the 12 Agile principles can be grouped into following four context: [4]

1. Customer-centric

2. Developer-centric
3. Architecture-centric
4. Management-centric

Q.1.2 Does identification of risks within a project also relate to risks associated with business outcomes? How do the two differ? [2]

Q.7 Set. (A) Develop an estimate for the schedule required to develop course materials for the following two modules.

Module-1(Epic): (Introduction, Course Objectives, and Agile Overview)

Module-2 (Epic): (Agile Fundamentals)

Work is divided into two-week sprints and we have a velocity of completing 20 story points of work in each two-week sprint. The following breakdown of Module-1 and Module-2 stories are identified and estimated in story points.

Title	Estimate		Estimate
MODULE-1:Introduction, Course Objectives, and Agile Overview	**8**	**MODULE-2:Agile Fundamentals**	**17**
Introduction and Course Objectives Introduction	2	Agile History, Values, and Principles	11
Course Objectives	1	Agile Manifesto Values	3
Introduction	1	Agile Manifesto Principles	8
Agile Overview	6	Agile Benefits and Obstacles to Becoming Agile	6
What Is Agile?	3	Agile Benefits	3
Agile Perception versus Reality	3	Obstacles to Becoming Agile	3

Note that the items in the hierarchy are summed at different levels.

Q.1.1 Select two items in the list and write a user story to describe each one. [2]

Q.1.2 Determine the Initial time (Epic level) and updated schedule (after breakdown) required to prepare the course contents. [4]

Q.7 Set. (B) Consider a 12-month waterfall project with four months for requirements and design, four months for coding, four months for testing, and one month for release to production.

Q.1.1 Plot a value graph with a time range of 0 to 12 months on the x-axis and a percent of value supplied range of 0% to 100% on the y-axis.
The Numbers Usable Features Delivered in Percentage = Value. [2]

Q.1.2 If the project is being completed in scrum, plot the value graph. [2]

Q.1.3 Show how the risk reduction would take place in both types of projects, if the risks are identified at the start of the project. [2]

Q.7 Set. (C) Using the template provided, create a sample communication strategy for an Agile team. The template includes What exactly is the Artifact? Who will be the artifact's owner/provider? Whomever the information is to be communicated with, When this item is completed and updated, How will this artifact be created? [6]

What?	Provider?	Whom?	When?	How?
Project Vision				
Release plan				

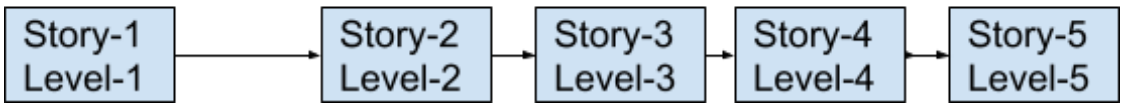
Product backlog				
Agile Team Working Agreement				
Iteration backlog				
Project and iteration status (burnup Teamchart, iteration status, QA Report, demo of working software)				
Team process improvement changes				

Q.8 Set. (A) Identify six typical software project risks, two from each of the following categories: customer, technical, and social. How these risks are distributed and owned by agile teams in order to address them. [3]

Q.8 Set. (B) The following issues are confronting an Agile team. What is your solution to these issues? [3]

1. subject matter experts, not the team, do all the estimation
2. no collective ownership of the work
3. too many open tasks per person
4. 30-day sprints result in larger task sizes
5. limited visibility into status
6. Too many code merge issues

Q.8 Set. (A) Pretend you're creating an account management page for an online retailer, and you're writing the stories. For account management, there could be several Epic stories. Take one epic story that can be broken down into five levels. For the decomposition, consider one storey for each level, as shown below. [3]



Check List

Birla Institute of Technology & Science, Pilani
Work-Integrated Learning Programmes Division
Second Semester 2021-2022
Proofreading and Checking of Question Papers

Course Number : __SE ZG 544_____

Course Title :____Agile Software Process_____

Please check and verify to ensure that the question papers are good, correct and complete in all aspects such as:

S.No.	Particulars	YES	NO
1	All questions are well within the syllabus prescribed for the evaluation component according to the Plan of Self-Study given in the course handout. No question is outside the prescribed syllabus.	Yes	
2	Balanced coverage of the topics given in the prescribed syllabus for the evaluation component.	Yes	
3	All Questions are appropriate for the type of evaluation component	Yes	
4	Appropriate weightage for each question or part(s) thereof is provided.	Yes	
5	There are no spelling or grammatical mistakes or typographical errors.	Yes	
6	Numbering of questions and the parts thereof are correct.	Yes	
7	Figures / tables / mathematical symbols / data for questions are provided.	Yes	
8	The total marks of the question paper is exactly the same as the maximum marks for the evaluation component.	Yes	
9	Specific instructions are provided wherever applicable.	Yes	
10	There are no objective type or multiple choice type questions or options among questions.	Yes	

Evaluation Component Comprehensive Examination
3 **Regular**

I have carefully checked the above mentioned question paper based on the guidelines given above and certify that the question paper is correct and complete in all respects. I also confirm that the complete solutions with detailed marking scheme have been prepared.

Instructor's Name : __K. Anantharaman_____

Instructor's Signature ___K.Anantharaman_____

Date : 21-4-22