

### PART A (10\*2=20)

#### Answer ALL

- Do you think the role of computer software has undergone significant change over last half-century? Justify your answer.
- Infer the software engineering principle, “The Reason it All Exists”
- Anitha, a fresher of a software company, encounter problems related to establishing communication and gathering requirements. which process patterns she should refer to get solutions?
- Map the following keywords with a suitable process model  
Software reuse, defect free software, controlled and systematic aspects of classic life cycle model, mechanism for identifying software requirements.
- Explicate the standard of software companies that have SCAMPI and SPICE certifications.
- Ramya has to create a job portal software, all on her own. Which process model will be suitable for her? Justify your answer. Describe the activities of the model in brief.
- State why the proponents of agility argue that agile process models are superior to other process models.
- Neatly sketch the activities of Extreme Programming process model.
- A surveillance software has 4 external inputs, 5 external outputs, 3 external enquiries, 5 internal logical files and 2 external interface files, where in, the implementation of external inputs and external enquiries of the software are of simple complexity and the other information domain values are average complexity. The  $\Sigma Fi = 68$ . Compute the functions points of the software.
- An object-oriented software has 20 key classes with the following type of interfaces. 7 key classes – No GUI, 6 key classes- Text-based GUI, 4 key classes – Conventional GUI and 3 key classes – complex GUI. Compute the number of person/days to complete the software.

### PART B (3\*10=30)

#### Answer ALL

- You’ve launched a new startup with a small self-directed project team that manages itself to produce high-quality software. Your friend asks for a dairy manufacturing solutions software that will help him streamline his company’s operations and bring his product to market, faster and more cost efficiently. The software should support with the unique requirements in the areas of product

development, production, inventory, quality, costing and warehousing. The software should also address the processing of by-products and co-products, commonly found in the dairy industry. Since this marks your inaugural project in your newly established startup, which process model would you select to build the project. Justify the reason and explain the model in detail.

- What principles should someone adhere to if they aim to attain agility?
- The smartwatch software is a multifunctional, intuitive, and user-friendly platform designed to enhance the functionality and convenience of a smartwatch device. This software seamlessly integrates with the smartwatch's hardware to deliver a range of features and capabilities, including: time keeping, health and fitness tracking, music and media control, GPS and navigation, voice control and notifications. The estimated LOC of each module is given in the table below:

Module	LOC
time keeping	2,500
health and fitness tracking	5,200
music and media control	6,900
GPS and navigation	3,380
voice control	2,700
notifications	1,850

Having, the average productivity of system of this type is 730LOC/pm, the burdened labour rate is \$5800person/month and the cost per line of code is \$14, Compute the effort in person/month. Compare the effort in person/month with Putnam and Myer’s Equation.

### PART A (10\*2=20)

Answer ALL

	CO	RBT
1.Do you think the role of computer software has undergone significant change over last half-century? Justify your answer.	1	5
2.Infer the software engineering principle, “The Reason it All Exists”	1	2
3.Anitha, a fresher of a software company, encounter problems related to establishing communication and gathering requirements. which process patterns she should refer to get solutions?	1	4
4.Map the following keywords with a suitable process model Software reuse, defect free software, controlled and systematic aspects of classic life cycle model, mechanism for identifying software requirements.	1	1
5.Explicate the standard of software companies that have SCAMPI and SPICE certifications.	1	2
6.Ramya has to create a job portal software, all on her own. Which process model will be suitable for her? Justify your answer. Describe the activities of the model in brief.	1	5
7.State why the proponents of agility argue that agile process models are superior to other process models.	2	1
8.Neatly sketch the activities of Extreme Programming process model.	1	3
9.A surveillance software has 4 external inputs, 5 external outputs, 3 external enquiries, 5 internal logical files and 2 external interface files, where in, the implementation of external inputs and external enquiries of the software are of simple complexity and the other information domain values are average complexity. The $\Sigma Fi = 68$ . Compute the functions points of the software.	4	3
10.An object-oriented software has 20 key classes with the following type of interfaces. 7 key classes – No GUI, 6 key classes- Text-based GUI, 4 key classes – Conventional GUI and 3 key classes – complex GUI. Compute the number of person/days to complete the software.	4	3

### PART B (3\*10=30)

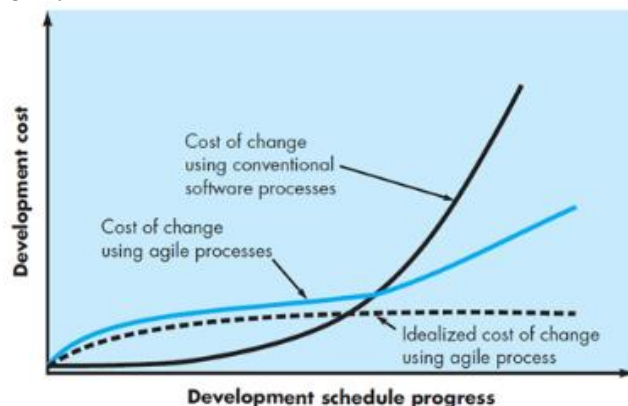
Answer ALL

11.You’ve launched a new startup with a small self-directed project team that manages itself to produce high-quality software. Your friend asks for a dairy manufacturing solutions software that will help him streamline his company’s operations and bring his product to market, faster and more cost efficiently. The software should support with the unique requirements in the areas of product development, production, inventory, quality, costing and warehousing. The software should also address the processing of by-products and co-products, commonly found in the dairy industry. Since this marks your inaugural project in your newly established startup, which process model would you select to build the project. Justify the reason and explain the model in detail.	1	5														
12.What principles should someone adhere to if they aim to attain agility?	2	1														
13.The smartwatch software is a multifunctional, intuitive, and user-friendly platform designed to enhance the functionality and convenience of a smartwatch device. This software seamlessly integrates with the smartwatch's hardware to deliver a range of features and capabilities, including: time keeping, health and fitness tracking, music and media control, GPS and navigation, voice control and notifications. The estimated LOC of each module is given in the table below: <table><tr><td>Module</td><td>LOC</td></tr><tr><td>time keeping</td><td>2,500</td></tr><tr><td>health and fitness tracking</td><td>5,200</td></tr><tr><td>music and media control</td><td>6,900</td></tr><tr><td>GPS and navigation</td><td>3,380</td></tr><tr><td>voice control</td><td>2,700</td></tr><tr><td>notifications</td><td>1,850</td></tr></table> Having, the average productivity of system of this type is 730LOC/pm, the burdened labour rate is \$5800person/month and the cost per line of code is \$14, Compute the effort in person/month. Compare the effort in person/month with Putnam and Myer’s Equation.	Module	LOC	time keeping	2,500	health and fitness tracking	5,200	music and media control	6,900	GPS and navigation	3,380	voice control	2,700	notifications	1,850	4	3
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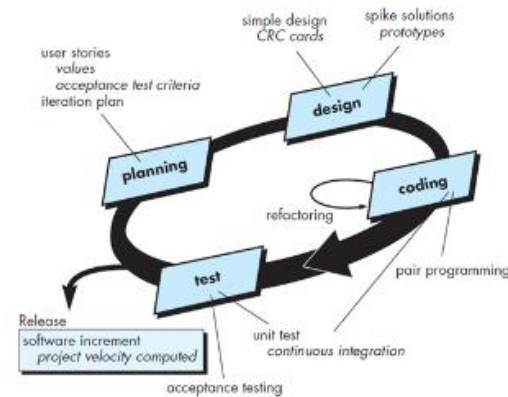
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#### Answer ALL

1. Dramatic improvements in hardware performance, profound changes in computing architectures, vast increases in memory and storage capacity, and a wide variety of exotic input and output options have all precipitated more sophisticated and complex computer-based systems.
2. A software system exists for one reason: to provide value to its users. All decisions should be made with this in mind. Before specifying a system requirement, before noting a piece of system functionality, before determining the hardware platforms or development processes, ask yourself questions such as: “Does this add real value to the system?” If the answer is no, don’t do it. All other principles support this one.
3. Anitha, should refer, Stage Pattern for establishing communication, Task Pattern for Requirements gathering
4. Software reuse – Component based, defect free software – formal methods, controlled and systematic aspects of classic life cycle model - Spiral, mechanism for identifying software requirements - Prototyping.
5. Companies that have SCAMPI is good at initiating, diagnosing, establishing, acting, and learning software projects and companies that have SPICE will define set of requirements for software process assessment.
6. Ramya will develop the software using personal software process. The activities of the model are planning, high-level design, high-level design review, development and postmortem.
7. Agility



### 8. Extreme Programming process model



9. Count Total =108; FP=143.64.

10. Number of Key Classes-20; Number of Support classes-.46.5; Total Number of classes-66.5; Effort in person/days=930person/days

### PART B (3\*10=30)

#### Answer ALL

11. Team Process Model and its explanation.
12. Explanation of 12 Agile Principles
13. The estimated LOC of the project

Module	LOC
time keeping	2,500
health and fitness tracking	5,200
music and media control	6,900
GPS and navigation	3,380
voice control	2,700
notifications	1,850
<b>Total LOC</b>	<b>22,530</b>

LOC based Estimation:  $5800/730=8$ ; Total cost =1,80,240; Effort in p/m=1,80,240/5800=31 p/m; or Total cost=3,15,420; Effort in p/m=3,15,420/5800=54.38p/m

Putnam and Myer's

$$t_{min}=8.14*(22530/2000)^{0.43}=23.060$$

$$E=180*0.28*(1.921)^3=357.67=358p/m$$