1.2.3

SOFTWARE DEVELOPMENT

TOPIC WISE EXAM QUESTIONS

ANSWERS

A-LEVEL OCR

2	c	i	1 mark per bullet to max 4, e.g. • spiral works on a small set of requirements… • …waterfall starts with all requirements • spiral repeats from the start of the cycle each time… • …waterfall to repeat needs to reverse through previous stages first • Spiral focuses on risk mitigation… • … Waterfall focuses on the delivery of the project as a whole.	4	Max 2 marks if no explicit differences identified between the models.
2	c	ii	1 mark e.g. • The client needs the program quickly • The client wants to be heavily involved • The project is only small • The project is low risk	2	
2	c	iii	1 mark for name 1 mark for description e.g. • agile/rapid application development • building/use of prototypes • extreme programming • type of agile // has subsequent releases of new features	2	Accept any sensible methodology and description,

(f)	**Mark Band 3–High Level (7-9 marks)** The candidate demonstrates a thorough knowledge and understanding of both waterfall and the spiral model. The material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation. The candidate provides a thorough discussion which is well balanced. Evaluative comments are consistently relevant and well-considered. There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Mark Band 2-Mid Level (4-6 marks)** The candidate demonstrates reasonable knowledge and understanding of waterfall and/or the spiral model; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation. The candidate provides a sound discussion, the majority of which is focused. Evaluative comments are for the most part appropriate, although one or two opportunities for development are missed. There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence. **Mark Band 1-Low Level (1-3 marks)** The candidate demonstrates a basic knowledge of some aspects of either waterfall or the spiral model; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided.	9 AO1.1 (2), AO1.2 (2), AO2.1 (2), AO3.3 (3)	**AO1** The spiral model has four quadrants (determine objectives, identify and manage risk, develop and test, plan next iteration). Client feedback then informs future development and prototypes which feedback into future revisions. Waterfall has a structured analysis/design/development/test flow. Progress to the next step is not made until the previous step is completed. **AO2** The spiral model relies on frequent client feedback. Spiral produces functional prototypes where features are added incrementally. Spiral model has more focus on risk; projects may be modified or even dropped if risk is too great. Waterfall is much more structured and very reliant on getting the definition of requirements correct at the start; changes are harder to add in at a later stage. However, this forces the definition to be well understood. **AO3** Spiral involves client feedback, prototypes and evolving projects. Better option where requirements may change. Waterfall is better where requirements are very clear to begin with and outcomes known. Spiral is better for risk management. If the programmer has a large team then waterfall may be more appropriate due to the clearly defined responsibilities at each stage.
1	(e)	1 mark per bullet up to a maximum of 2 marks: • Waterfall lifecycle • Agile methodologies • Extreme programming • Spiral model • Rapid Application Development	2 A01.1 (2)	Allow RAD as acronym this time

	c		– Extreme programming is a software development methodology.	4	
			– Focus is on good quality code	AO1.1 (2)	
			– It is an agile paradigm	AO2.1 (2)	
			– it is designed to allow development to respond to changing user requirements.		
			– Involves paired programing		
			– Program is regularly reviewed/iterative process.		

Suited to this scenario as…

– Types of virus/threat is continually changing/updating
– In order to detect virus effectively there needs to be an emphasis on code quality.

(1 per – Max 4. If no reason given for it being suitable for scenario, max 3)

| 4 | | | **Mark Band 3–High Level (7-9 marks)** The candidate demonstrates thorough knowledge and understanding of reasons for the use of different methodologies; the material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation. The candidate provides a thorough discussion which is well-balanced. Evaluative comments are consistently relevant and well-considered. There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Mark Band 2-Mid Level (4-6 marks)** The candidate demonstrates reasonable knowledge and understanding of reasons for the use of different methodologies; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part relevant to the explanation. The candidate provides a reasonable discussion, the majority of which is focused. Evaluative comments are for the most part appropriate, although one or two opportunities for development are missed. There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence. | 9 AO1.1 (2) AO1.2 (2) AO2.1 (2) AO3.3 (3) | **AO1: Knowledge and Understanding** The following is indicative of possible factors/evidence that candidates may refer to but is not prescriptive or exhaustive:
• Waterfall
  o Series of stages
  o Followed in order
  o Can go back up the order
  o Then needs to follow back down in order
  o Formal, documented stages
• Rapid application
  o Use of prototypes
  o No formal analysis, design stages
  o More feedback used to influence future stages
  o Faster development

AO2.1: Application The selected knowledge/examples should be directly related to the specific question. The following is indicative of possible factors/evidence that candidates may refer to but is not prescriptive or exhaustive.
• Discussion of how the methodologies would support the development
• Discussion of the disadvantages of using each methodology

AO3.3: Evaluation Candidates will need to consider a variety of viewpoints in relation to testing strategies and will make evaluative comments about the issues and solutions they are discussing e.g.
• The benefits of a method
• The disadvantages of a method |

10	a		- Prototype is created (1)	4	
			- (Evaluated and) feedback used to inform next iteration (1)	(AO1.1)	
			- Any changes are made (1)		
			- Process repeated until…(1)		
			… prototype becomes final product. (1)		
			(Max 4)		

EXTRA

1		**Mark Band 3–High Level (9–12 marks)** The candidate demonstrates a thorough knowledge and understanding of both methodologies; the material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence / examples will be explicitly relevant to the explanation. The candidate is able to weigh up both sides of the argument which results in a supported and realistic judgment as to which methodology should be used. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Mark Band 2–Mid Level (5–8 marks)** The candidate demonstrates reasonable knowledge and understanding of both methodologies; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence / examples are for the most part implicitly relevant to the explanation. The candidate makes a reasonable attempt to come to a conclusion showing some recognition of influencing factors that would determine which methodology should be used. *There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.* **Mark Band 1–Low Level (1–4 marks)** The candidate demonstrates a basic knowledge of methodologies with limited	12	If only one methodology considered – MAX 6 marks. **AO1: Knowledge and Understanding** The following is indicative of possible factors / evidence that candidates may refer to but is not prescriptive or exhaustive: • The waterfall lifecycle involves linear stages whereas XP takes on an agile, iterative approach. • The waterfall lifecycle establishes requirements in early stages and subsequent stages focus on these – new requirements can be adopted throughout XP. • The waterfall lifecycle focuses on the end user at the start and then they may be consulted at different points throughout the project whereas an end user is integral throughout XP. • In the waterfall lifecycle the development phase focuses on code that meets the requirements / design. In XP the quality of the code is an important factor – paired programming helps focus on this. • The waterfall lifecycle although adopted for large projects it can be inflexible and limits changing requirements. **AO2.1: Application** The selected knowledge / examples should be directly related to the specific question. • Discussion of how the methodologies would impact upon the choices made regarding abstraction, any preconditions and how they are addressed. • Discussion around how the methodologies would impact the order of steps in any procedures and how sub-procedures would be implemented • How the methodologies could

			understanding shown; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides nothing more than an unsupported assertion. *The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.* **0 marks** No attempt to answer the question or response is not worthy of credit.		potentially affect how decisions and the logic involved are dealt with and how concurrency is dealt with • Discussion of other social factors that affect the use of the different methodologies. **AO3.3: Evaluation** Having considered the different sides to the argument candidates will need to reach a supported judgment based on the evidence included in their response. There should be no bias in marks as to which methodology is chosen but especially in the top mark band there must be a clear link between the points candidates have made and justification. e.g. The waterfall lifecycle establishes requirements in early stages and subsequent stages focus on these. New requirements can be adopted throughout XP. The requirements in this project are likely to be static making the Waterfall model a more appropriate approach. **OR** In the waterfall lifecycle the development phase focuses on code that meets the requirements / design. In XP the quality of the code is an important factor. Paired programming helps focus on this. For this utility to be successful it must work more efficiently than its competitors and code developed through XP is more likely to achieve this, therefore XP is a more appropriate approach.
2		i	– Feasibility Study – Investigation / Requirements Elicitation – Analysis – Design – Implementation / Coding – Testing – Installation – Documentation – Evaluation – Maintenance (1 per –, max 3)	3	
		ii	– Tends to suit large scale projects … – ..An OS is an example of such a big project. – Tends to suit projects with stable requirements … – … And the base requirements of an OS are unlikely to change. (1 per –, max 2)	2	
		iii	If a change does occur in the requirements the lifecycle cannot respond easily, often at the cost of time and money.	1	

If you found this useful, drop a follow to help me out!

THANK YOU!

GCST