

1.2 SOFTWARE & SOFTWARE DEVELOPMENT · 1.2.3

Software development methodologies — Mark scheme

36 marks · spec 1.2.3(a)(b)

AO key: AO1 = knowledge & understanding · AO2 = application · AO3 = reasoned judgements. Accept any valid alternative; do not award the same point twice.

Q	ANSWER	AO	MARKS
1(a)	A structured approach to the stages of the software development lifecycle. (1)	AO1	1
1(b)	1 mark per stage, max 3: analysis / design / implementation (coding) / testing / maintenance / evaluation. (3)	AO1	3

Q	ANSWER	AO	MARKS
2(a)	1 mark per point, max 3: • stages are carried out in a strict sequence (1) • each stage is completed before the next begins (1) • output of one stage feeds into the next; well documented (1)	AO1	3
2(b)	A project with clear/fixed requirements that are unlikely to change. (1)	AO2	1
2(c)	Any one + development: hard/costly to go back to an earlier stage (1); the customer sees working software only late, so problems surface late (1). (2)	AO1	2

Q	ANSWER	AO	MARKS
3(a)	Iterative/incremental development in small cycles (1); each delivering working software with user feedback (1). (2)	AO1	2
3(b)	1 mark per point, max 3: • the plan is revisited every cycle (1) • frequent feedback catches changes early (1) • new requirements can be added to the next iteration rather than reworking a finished system (1)	AO2	3

Q	ANSWER	AO	MARKS
4(a)	An agile methodology (1) focused on software quality and responding to changing requirements (1). (2)	AO1	2
4(b)	A feature + how it helps, e.g. pair programming (1) improves code quality / catches errors early (1). Allow frequent releases, test-driven development, on-site customer. (2)	AO2	2

Q	ANSWER	AO	MARKS
5(a)	Iterative development in loops, each producing a refined prototype (1); with risk analysis at each loop (1). (2)	AO1	2
5(b)	A large / high-risk / long-running project. (1)	AO2	1
5(c)	Fast development using prototyping (1) refined continually with user feedback (1). (2)	AO1	2

Q	LEVELS-OF-RESPONSE MARK SCHEME	AO	MARKS										
6	Mark using the levels descriptors below. AO1 (knowledge of XP and waterfall), AO2 (application to the changing-requirements project), AO3 (justified recommendation). <table><tr><th>LEVEL</th><th>DESCRIPTOR</th></tr><tr><td>Level 3 (9–12)</td><td>Thorough, balanced discussion of both XP and waterfall with accurate merits and drawbacks, clearly applied to a project with changing requirements, leading to a clear justified recommendation. Accurate terminology; well structured.</td></tr><tr><td>Level 2 (5–8)</td><td>Discusses both methodologies with some application to the context; a recommendation is made with partial justification.</td></tr><tr><td>Level 1 (1–4)</td><td>Basic points about one or both methodologies with little application to the context and little or no justified recommendation.</td></tr><tr><td>0</td><td>Nothing creditworthy.</td></tr></table> Indicative content (credit any valid point): • Waterfall: clear plan and documentation, simple to manage; but rigid, hard/costly to change, customer sees software late — poor fit when requirements change. • XP: iterative with frequent releases, pair programming, test-driven development and an on-site customer; adapts quickly to change and keeps quality high. • Application: because requirements change frequently, waterfall's late feedback and resistance to change are a serious problem, while XP's short cycles and on-site customer handle change well. • Justified conclusion: XP is more suitable here; a valid waterfall case (e.g. if a fixed contract/documentation were required) may be credited.	LEVEL	DESCRIPTOR	Level 3 (9–12)	Thorough, balanced discussion of both XP and waterfall with accurate merits and drawbacks, clearly applied to a project with changing requirements, leading to a clear justified recommendation. Accurate terminology; well structured.	Level 2 (5–8)	Discusses both methodologies with some application to the context; a recommendation is made with partial justification.	Level 1 (1–4)	Basic points about one or both methodologies with little application to the context and little or no justified recommendation.	0	Nothing creditworthy.	AO1 ×4 AO2 ×4 AO3 ×4	12
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Total for paper: 36 marks