1.2 Types of Software and Development Methodologies: Test Pack

Total Marks

OCR H446 · Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Software can be classified into different types according to its purpose.

(a) State what is meant by the term 'system software'. **(2)**

(b) State three examples of system software. **(3)**

(c) Explain one function of an operating system that makes it an example of system software. **(2)**

(Total for Question 1 is 7 marks)

2 The waterfall model is a traditional, linear approach to software development.

(a) List, in the correct order, the five stages of the waterfall model of software development. **(5)**

(b) State two characteristics of the waterfall model. **(2)**

(c) A software company is developing a system for a client whose requirements are likely to change significantly during development. Explain one disadvantage of using the waterfall model for this project. **(3)**

(Total for Question 2 is 10 marks)

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3 Scrum is a popular framework for implementing agile software development.

(a) State three roles defined in the Scrum framework. **(3)**

(b) Define the term 'sprint' as used in Scrum. **(2)**

(c) Explain the purpose of a daily stand-up (daily scrum) meeting. **(2)**

(d) Explain the purpose of a sprint retrospective. **(2)**

(Total for Question 3 is 9 marks)

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Mark scheme · 1.2 Types of Software and Development Methodologies: Test Pack

Question 1

(a) Software that manages/controls the hardware and resources of a computer system (oe) **B1**

(a) ...and provides a platform that allows application software to run (oe) **B1**

(a) Answer: System software is software that manages and controls a computer's hardware and resources, providing a platform on which application software can run.

(b) One correct example of system software, from: operating system / device driver / BIOS (firmware) / translator (compiler, interpreter, assembler or linker) / utility program (e.g. disk defragmenter, backup software, anti-virus) **B1**

(b) A second, different correct example of system software (from the same list, or any other correct example of system software) **B1**

(b) A third, different correct example of system software (from the same list, or any other correct example). Maximum 3 marks; the same example is not credited twice (e.g. 'operating system' and 'Windows' score once) **B1**

(b) Answer: Operating system, device driver, BIOS (firmware); (compiler/interpreter/assembler/linker also acceptable).

(c) Identifies a valid OS function, e.g. memory management / process management / file management / peripheral (device) management / user interface (oe) **B1**

(c) Explains how this manages hardware/resources on behalf of application software/users, e.g. allocates and deallocates RAM to running processes so each has the space it needs and programs do not conflict (oe, ft from function named) **B1**

(c) Answer: Memory management: the OS allocates and deallocates RAM to running processes, ensuring each program has the memory it needs and preventing conflicts between programs.

Question 2

(a) 1. Requirements analysis/gathering **B1**

(a) 2. (System) design **B1**

(a) 3. Implementation (coding) **B1**

(a) 4. Testing (verification) **B1**

(a) 5. Maintenance (deployment/evaluation); accept equivalent stage names, but marks lost if order is incorrect (award marks for stages named correctly regardless of exact wording, ft position) **B1**

(a) Answer: Requirements analysis, design, implementation, testing, maintenance.

(b) One correct characteristic of the waterfall model, from: each stage must be completed before the next begins; stages do not overlap; requires full documentation at each stage; no return to a previous stage once it is complete (without formal change control) **B1**

(b) A second, different correct characteristic from the same list. Maximum 2 marks; do not credit the same characteristic twice **B1**

(b) Answer: Each stage must be finished before the next stage starts; there is normally no return to an earlier, completed stage.

(c) Waterfall fixes requirements at the start and does not allow easy return to an earlier stage (oe) **B1**

(c) If requirements change during development, this leads to costly and time-consuming rework, since design/implementation/testing would need to be redone (oe, ft) **B1**

(c) The client may end up receiving a system that no longer meets their (changed) needs, or the project is delayed/over budget as a result (oe, ft) **B1**

(c) Answer: Because waterfall fixes requirements at the outset and does not easily allow a return to an earlier stage, any changes to requirements during development force costly and time-consuming rework of design, implementation and testing, risking delays, extra cost, or a final system that no longer matches the client's actual needs.

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Question 3

(a) Product Owner **B1**

(a) Scrum Master **B1**

(a) Development team (member(s)) **B1**

(a) Answer: Product Owner, Scrum Master, Development team.

(b) A fixed, short time period (typically 1 to 4 weeks) (oe) **B1**

(b) ...during which a specific set of work/features is completed, producing a potentially shippable increment (oe) **B1**

(b) Answer: A sprint is a fixed, short period of time (typically 1 to 4 weeks) during which a specific set of work is completed, producing a potentially shippable increment of the product.

(c) A short (e.g. 15 minute) meeting held each day where team members report progress, plans and blockers (oe) **B1**

(c) ...so the team can quickly identify and address problems and coordinate work, keeping everyone up to date (oe) **B1**

(c) Answer: The daily stand-up is a short daily meeting where each team member reports what they have done, what they plan to do, and any blockers, so problems can be identified quickly and the team's work stays coordinated.

(d) A meeting held at the end of each sprint where the team reflects on how the sprint went (oe) **B1**

(d) ...to identify what worked well and what could be improved, so future sprints can be run more effectively (continuous improvement) (oe) **B1**

(d) Answer: The sprint retrospective is a meeting held at the end of each sprint where the team reflects on what went well and what could be improved, so future sprints can be run more effectively.

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