1 A program designer is investigating the use of concurrent processing.

i. Describe what is meant by the term ‘concurrent processing’.

---

[2]

ii. Give **two** benefits of using concurrent processing.

1 ---

---

2 ---

---

[2]

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

2 Taylor has written a game which uses concurrent processing.

i. Describe what is meant by the term ‘concurrent processing’.

[2]

ii. Explain why concurrent processing is needed to allow multiple users to log in and interact with game elements at the same time.

[3]

3 OCR-Tickets wants to sell tickets for their concerts, plays and other events online. A customer should be able to create an account and then be able to log into their account. Once logged in, customers should be able to carry out actions such as setting their preferences and purchasing tickets.

OCR-Tickets have hired a software development company to create the system for them.

* Discuss the need for concurrent processing in OCR-Ticket’s system and the benefits and drawbacks of using this.

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

[9]

4 A programmer is developing an ordering system for a fast food restaurant. When a member of staff inputs an order, it is added to a linked list for completion by the chefs.

The programmer is considering using concurrent programming.

Discuss how concurrent programming can be applied to the food ordering system and the benefits and limitations of doing so. [9]

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

END OF QUESTION PAPER

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

Question			Answer/Indicative content	Marks	Guidance
1		i	1 mark for each to max 2 • Processes happen at the same time // processes overlap • One process can start before another one finishes • Each process is given a slice of processor time • Different processes can be executed (in parallel) by different processors/cores	2	Examiner's Comments Several candidates confused parallel processing (executing more than one instruction simultaneously) with concurrent processing (where most than one process/task is running at the same time). A lack of technical vocabulary was observed with many candidates giving responses such as 'many things processed at the same time', without specifying what the 'things' were. Occasionally candidates erroneously thought that processor pipelining was an example of concurrent processing. While many candidates successfully identified that multiple processes are run simultaneously, fewer went on give the mechanism by which this could be achieved. Where they did so, these included timeslicing switching between different processes on a single processor, or use of multiple cores/parallelism to simultaneously execute different processes.
		ii	1 mark each to max 2 e.g. • More efficient processor use // Less idle time for processor // Greater throughput • Long running tasks do not delay short running tasks • Tasks requiring preconditions can wait and then resume execution • User is able to interact with the computer while other tasks are running	2	Examiner's Comments Candidates found it difficult to give well-qualified responses to this question. Many candidates gave the definition for concurrency running multiple tasks at the same time as a benefit, which was not mark worthy. Quicker processing/improved performance was not enough on its own without specifying that this was within a given time unit. Concurrent processing does not increase the actual speed of the CPU. Efficiency as a benefit on its own was insufficient, whereas 'less CPU idle time' was a well-qualified example of a benefit.
			Total	4	

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

Question			Answer/Indicative content	Marks	Guidance
2		i	1 mark per bullet to max 2 e.g. • Multiple processes being executed at the same time // appearing to happen simultaneously • Giving processes a slice of the processor time • Having multiple processors each carrying out a different process	2 AO1.1 (2)	
		ii	1 mark per bullet to max 3 e.g: • Game could have large number of requests to the server at a time • … server needs to respond in reasonable time • … having multiple processors handling the different requests would increase response time • Users could override each other's changes • … e.g. needs to handle if someone updates their circus while someone else is visiting • …use record locking to stop edits if someone else has access to data • Different users will have different response times • …therefore the processor can still handle other requests • …so that the performance for other users is not affected	3 AO2.1 (2) AO2.2 (1)	
			Total	5	

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

Question			Answer/Indicative content	Marks	Guidance
3			**Mark Band 3 – High level (7-9 marks)** The candidate demonstrates a thorough knowledge and understanding of concurrent processing; 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. *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 concurrent processing; 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 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.* **Mark Band 1 – Low Level (1-3 marks)** The candidate demonstrates a basic knowledge of concurrent processing with limited understanding shown; the material is basic and contains some inaccuracies. The candidates makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides a limited discussion which is narrow in focus. Judgements if made are weak and unsubstantiated. *The information is basic and comunicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.*	9 AO1.1 (2) AO1.2 (2) AO2.1 (2) AO3.3 (3)	**AO1: Knowledge and Understanding** **Indicative content** • Processes are happening at the same time/at overlapping times • One process may need to start before a second has finished • Individual processes are threads, each thread has a life line • One request will be sent to the server, this will have a thread **AO2: Application** • Multiple requests to the server can be made at the same time • Programming on server will need to allow multiple threads to manipulate a list of requests • Programming will need to restrict access to the database of seats/sales etc. • Will allow those reading and writing to manipulate at the same time • Record locking will need implementing – more complex programming • May be selling alongside other systems, therefore needs to communicate with external systems that will also use record locking to avoid two different external companies accessing and selling the same tickets. **AO3: Evaluation** • Will allow for multiple access to the website at the same time by different customers – as it would happen in real life • Will allow for multiple ticket sales for the same event without selling the same seat twice

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

Question			Answer/Indicative content	Marks	Guidance
			0 marks No attempt to answer the question or response is not worthy of credit.		
			Total	9	

© OCR 2026. You may photocopy this page.

Created in ExamBuilder

Question	Answer/Indicative content	Marks	Guidance
4	**Mark Band 3 – High level** **(7-9 marks)** The candidate demonstrates a **thorough** knowledge and understanding of concurrent programming; 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. *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 concurrent programming; 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 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.* **Mark Band 1 – Low Level** **(1-3 marks)** The candidate demonstrates a **basic** knowledge of concurrent programming with limited understanding shown; the material is basic and contains some inaccuracies. The candidates makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides a limited discussion which is narrow in focus. Judgements if made are weak and	9 AO1.1 (2) AO1.2 (2) AO2.1 (2) AO3.3 (3)	**AO1: Knowledge and Understanding** **Indicative content** • Processes are happening at the same time / at overlapping times • Only 1 process can actually happen at a time on a single core processor, concurrent tries to simulate multiple processes • One process may need to start before a second has finished • Individual processes are threads, each thread has a life line **AO2: Application** • Multiple orders can be made and added to the list at the same time • Programming will need to allow multiple threads to manipulate a single list • Will allow those reading and writing to manipulate at the same time • Locking will need implementing – more complex programming **AO3: Evaluation** • Will allow for multiple orders at the same time – as it would happen in real life • Access to the linked list will need to be limited so it cannot be accessed / overwritten by two threads trying to do different operations • Not all of the process will be paralleliseable. X processors does not mean it will run in 1/xth of the time of one processor.

Question			Answer/Indicative content	Marks	Guidance
			unsubstantiated. *The information is basic and comunicated 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.		Examiner's Comment: It was clear that many candidates had not covered the concept of concurrency and how it allows different processes to occur at the same time. Strong candidates appreciated that this could be simulated on a single core with time slicing or implemented within a parallel architecture. Many candidates lost sight of the fact that answers needed to be related to computer science rather than a restaurant chain and could not explain the underlying computer science that would allow a solution to be delivered.
			Total	9	

© OCR 2026. You may photocopy this page.

Created in ExamBuilder