

2.1 COMPUTATIONAL THINKING · 2.1.2

Thinking ahead — Mark scheme

30 marks · spec 2.1.2(a)–(d)

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

Q	ANSWER	AO	MARKS
1(a)	1 mark each, max 3: film chosen · showing/date/time · number of seats · seat selection · user/payment details. (3)	AO2	3
1(b)	1 mark each, max 2: booking confirmation · e-ticket/seat numbers · total price/receipt · error message if unavailable. (2)	AO2	2
1(c)	Data the system receives / is given to process. (1)	AO1	1

Q	ANSWER	AO	MARKS
2(a)	A condition that must be true before a solution/subroutine can run correctly. (1)	AO1	1
2(b)	The list must be sorted (1); because binary search relies on order to discard half each step / gives wrong results on unsorted data (1). (2)	AO1	2
2(c)	The balance must be sufficient / $\geq$ the amount being withdrawn. (1)	AO2	1
2(d)	The divisor must not be zero. (1)	AO2	1

Q	ANSWER	AO	MARKS
3(a)	1 mark each, max 2: a library/standard function (e.g. sort) · a module · a subroutine/function · a class · a login or date-handling component. (2)	AO1	2
3(b)	1 mark each, max 2: saves time (write/test once) · more reliable (already tested) · easier maintenance (fix in one place) · consistency across a team/projects. (2)	AO1	2

Q	ANSWER	AO	MARKS
4(a)	Storing recently used data/results (1); so they can be reused quickly instead of being re-fetched/recalculated (1). (2)	AO1	2
4(b)	Hit: the data is in the cache, so the stored copy is returned immediately (1); Miss: it is not, so it is fetched/recomputed and then stored in the cache for next time (1). (2)	AO1	2
4(c)	Faster access / reduced load on CPU/network/database. (1)	AO1	1
4(d)	Uses extra memory / cached data can become stale (out of date). (1)	AO1	1

Q	LEVELS-OF-RESPONSE MARK SCHEME (9 MARKS)	AO	MARKS										
5	Mark using the levels descriptors below. AO1 (knowledge of caching), AO2 (application to a browser), AO3 (balanced evaluation with conclusion). <table><tr><th>LEVEL</th><th>DESCRIPTOR</th></tr><tr><td>Level 3 (7–9)</td><td>Thorough evaluation of benefits and drawbacks applied to a browser, with a justified conclusion. Clear reasoning; accurate terminology.</td></tr><tr><td>Level 2 (4–6)</td><td>Covers benefits and drawbacks with some development; a basic conclusion.</td></tr><tr><td>Level 1 (1–3)</td><td>A few points, largely one-sided, little development.</td></tr><tr><td>0</td><td>Nothing creditworthy.</td></tr></table> Indicative content (credit any valid point): • Benefits: pages/images load faster on return visits; less data downloaded; reduced load on the network and server; works partly offline. • Drawbacks: uses disk/memory; cached page may be stale (out of date) so the user sees old content; privacy — cached data left on the device; needs managing/clearing. • Application: browser checks cache first (hit vs miss); cache must be refreshed/invalidated when a page changes. • A justified conclusion (e.g. caching is worthwhile for speed, provided the cache is refreshed so content stays current).	LEVEL	DESCRIPTOR	Level 3 (7–9)	Thorough evaluation of benefits and drawbacks applied to a browser, with a justified conclusion . Clear reasoning; accurate terminology.	Level 2 (4–6)	Covers benefits and drawbacks with some development; a basic conclusion.	Level 1 (1–3)	A few points, largely one-sided, little development.	0	Nothing creditworthy.	AO1 ×3 AO2 ×3 AO3 ×3	9
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Total for paper: 30 marks