

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
1	a		Any one from e.g.: • An app designed for end users to complete an activity (1) • Type of software designed to help users perform a task (1) • Software that combines more than one program to meet a task (1) Credit any other appropriate response	1 (PO1)	Accept equivalent terminology <u>Examiner's Comments</u> This was a learned response from the specification with most candidates achieving the mark.
	b		Any one from: • Entertainment (1) • Lifestyle (1)	1 (PO2)	Accept equivalent terminology <u>Examiner's Comments</u> Most candidates identified that this was an Entertainment application and achieved the mark.
			Total	2	
2			Any two from e.g.: • Community drive development (1) • Customisation (1) • Free (distribution) / free to use (1) • Open-source code/ can be modified by users (1) • Platform portability (1) • Transparent/ openly discussed security (1) Credit any other appropriate response	2 (PO1)	Accept equivalent terminology <u>Examiner's Comments</u> Most responses given focused on the ability to customise the code or the fact that it was free. Both obtained marks and saw a healthy number of candidates achieving both marks.
			Total	2	

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3	a		Up to two marks for each characteristic of a Smart TV One mark for each characteristic identified. One mark for saying how it is suitable for the application use e.g.: • Internet connectivity (1) to allow the streaming service to be accessed on the TV/ allows apps to be downloaded/ updated (1) • Built in Apps/ app store/ has apps (1) so that BournStreaming app can be installed (1) • Multimedia functionality (1) allowing range of connections to be used to access BournStreaming (1) • Screen casting/ Mirroring (1) so app can be shown from a laptop/ phone (1) Credit any other appropriate response	4 (PO2)	Accept equivalent terminology The marking points are for those beyond a normal television <u>Examiner's Comments</u> The question asked for characteristics of a Smart TV – these are not the same as for a normal/ standard TV but the characteristics that are in addition to sound, screen size and having a remote control. The most common correct response was based around the need to be connected to a network/ the internet. Some candidates also correctly identified the need to install applications. An explanation requires a reason – why is that characteristic required to meet the purpose of the scenario – many candidates did not give an explanation but merely identified, or, in some cases, described the characteristic.								
	b	i	<table><tr><th>Component</th><th>Letter</th></tr><tr><td>Image</td><td>C</td></tr><tr><td>Call to action</td><td>A</td></tr><tr><td>Help message</td><td>B</td></tr></table>	Component	Letter	Image	C	Call to action	A	Help message	B	3 (PO3)	1 mark for each correct answer. Correct answers only. <u>Examiner's Comments</u> Nearly all candidates successfully identified C as the image. There was divided opinion as to A and B.
Component	Letter												
Image	C												
Call to action	A												
Help message	B												
		ii	Graphical User Interface /GUI (1)	1 (PO2)	<u>Examiner's Comments</u> This was a learned response from the specification. Unfortunately, most candidates were unable to identify Graphical User Interface (GUI).								
		iii	Any two from: • Audio/ Voice (1) • Movement/ gesture (1) • Touch (1)	2 (PO2)	Accept equivalent terminology Not GUI Do not accept reworded example of same interaction. <u>Examiner's Comments</u> Candidates answered this well with the majority scoring high. Those that did not, often gave mouse and keyboard as responses.								
			Total	10									

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4	a	Up to two marks for each disadvantage of the Waterfall software development model One mark for each disadvantage identified One mark for saying how disadvantage impacts development e.g.: • Lack of flexibility (1) leading to increased cost when making changes later (1) • Testing is late on (1) which can only highlight technical issues after the development phase (1) • Limited feedback early on (1) which means user issues only shown later in development (1) • Minimal client involvement (1) so development may not meet the requirements (1) • One stage needs to be completed before the next begins (1) increases time to complete the project (1) • Build-up of issues/ risks (1) can start small but be major issues by the time they reach the final phase (1) • Increase in cost if an error is found (1) as the previous steps need to be repeated (1) • Delays in system development (1) if a step needs to be repeated (1) • Unsuitable for smaller businesses (1) unlikely to have the personnel within the organisation (1) • Unsuitable for small tasks (1) the requirement of each stage takes too long to complete (1) • The model takes time to complete (1) which increases cost / requirements may have changed by the time it has completed (1) Credit any other appropriate response	4 (PO1)	Accept equivalent terminology <u>Examiner's Comments</u> While it was noted that the Waterfall model was known by many candidates the disadvantages given were not always correct or known. Where disadvantages were identified, they were not explained.  Misconception It is possible to go back a stage in the Waterfall model. While it is not designed for this, is difficult, generally discouraged and costly, it is possible.

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	b		One mark for identifying a suitable iterative model Up to two marks for a valid explanation. e.g.: Rapid Application Development / RAD (1) - allows quick development of prototypes (1) so feedback of the app can be gathered from users (1) Spiral (1) - allows continual development loops (1) to be used to act on feedback on the app consistently/ focuses on risk analysis (1) Agile (1) - allows issues to be identified early on with the app (1) so improvements can be made <u>quickly</u>/to changing requirements (1) Credit any other appropriate response	3 (PO2)	Accept equivalent terminology These are the only three models listed in the specification but there are others such as: - Rational Unified Process (RUP) - Iterative model (Pure) It the model identified is NOT iterative do not award marks. Do not accept: - Prototyping - Rapid Throwaway - Incremental - Evolutionary - Waterfall The model MUST be correct for the explanation to be awarded. <u>Examiner's Comments</u> Most candidates were able to identify an iterative model. Spiral, Agile and Rapid Application Development (RAD) were the most popular. However, those that did gain the mark for identifying the model were often unable to explain why the model they had chosen was suitable. Many attempted a description of the model (sometimes correct) instead of the explanation. Incorrect answers were commonly prototyping models.
			Total	7	

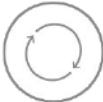
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5			<table><tr><th>Task</th><th>Phase</th></tr><tr><td>Feasibility study</td><td>Planning (1)</td></tr><tr><td>Quality assurance</td><td>Implementation (1)</td></tr><tr><td>Wireframe creation</td><td>Design (1)</td></tr></table>	Task	Phase	Feasibility study	Planning (1)	Quality assurance	Implementation (1)	Wireframe creation	Design (1)	3 (PO1)	1 mark for each correct answer. <u>Examiner's Comments</u> Many candidates achieved 1 mark, with many going on to score a second mark. Very few achieved all 3 marks. Feasibility study and wireframe creation were the most common two to be known.
			Task	Phase									
			Feasibility study	Planning (1)									
			Quality assurance	Implementation (1)									
Wireframe creation	Design (1)												
			Total	3									
6	a		Any one from: - Processes/ circle / rounded box (1) - Data store / open rectangle/ two horizontal lines (1) - Data flow / arrow (1) - External entity/ Rectangle (1)	1 (PO1)	<u>Examiner's Comments</u> Over half the candidates answered this correctly. Those who did not confused DFDs with flowcharts and gave components of that instead.								
	b		Up to two marks for explanation of use One mark for why it is used One mark for saying why it is appropriate to use it e.g.: - It clarifies system process (1) to show how inputs are converted into outputs (1) - It guides system design (1) by showing how different parts work together (1) - It identifies inefficiencies (1) by showing bottlenecks in the system so they can be improved (1) - It helps communication (1) between teams when developing an application (1) - It visually represents how data moves (1) to understand what is happening in a system/ application (1) - Identifies what data is handled / and where stored (1) assists developers in complying with regulations like GDPR (1) Credit any other appropriate response	2 (PO1)	Accept equivalent terminology <u>Examiner's Comments</u> Following on from Question 6 (a), a number of candidates wrote about the use of a flowchart during development scoring no marks. From those that did appreciate what a flowchart was, very few were able to explain why it was an appropriate tool to use, with many giving a description of what it was.								
			Total	3									

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Question		Answer/Indicative content	Marks	Guidance
7	a	Answer Level 3 (high) 7 - 9 marks A thorough discussion which shows detailed evaluation, which includes: • a range of points from both sides of the argument • a detailed analysis in the context of the question • a clear conclusion(s) with detailed reasons/ justifications • consistent use of appropriate subject terminology. Level 2 (mid) 4 - 6 marks An adequate discussion which shows sound evaluation, which includes: • some points from both sides of the argument • some analysis in the context of the question • an adequate conclusion(s) with relevant reasons/ justifications • some use of appropriate subject terminology. Level 1 (low) 1-3 marks A basic discussion which shows limited evaluation, which includes: • a few points from the argument • a limited analysis in the context of the question • a brief conclusion with limited reasons/ justifications • use of appropriate subject terminology is limited. 0 mark Answer is not worthy of credit	9 (PO3)	Indicative content Answers can include some of the following: Advantages of Critical Path Analysis (CPA)/ Critical Path Method (CPM) e.g.: • Aids scheduling • Can be used to monitor/ track progress • Can provide a visual map of project development • Helps prioritise resources • Identifies the most important tasks (Critical activities) • Identifies dependencies • Improves time management • Increased flexibility in non- critical tasks • Identifies shortest development time (with no slack available) Disadvantages of Critical Path Analysis (CPA)/ Critical Path Method (CPM) e.g.: • Does not highlight external risks • Large projects lead to increased complexity of lots of tasks • Needs accurate estimates to create accurate planning • Task interactions can be oversimplified • Time consuming to create/ update • Time is the focus not quality or cost Credit other relevant conclusions, points and examples. <u>Examiner's Comments</u> It was notable to see so many candidates who did not know what Critical Path Analysis (CPA) was. Answers that were focused on flowcharts, SWOT or DFDs were, unfortunately unable to score marks. Those candidates who did answer based on CPA/CPM either did not give the appropriate depth of answer – staying with identification and description rather than the explanation required or did not give both advantages and disadvantages. The question also asked for them to make a choice, with reasons – something many neglected.

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			Those candidates who had the depth of knowledge required did produce some very good answers, balancing both advantages and disadvantages with a reasoned conclusion. Exemplar 1 <i>I think Brown progress should use a critical path analysis because it shows the minimum time for the important tasks to be completed. This means that Brown progress will have an average completion date so they can plan the release beforehand of the streaming application.</i> <i>But a critical path analysis may not work for Brown progress because it is time consuming to make so there will be less time to spend on making the streaming application which can result in a rushed application being rushed, so it may not meet the expectations of Brown progress.</i> <i>Overall I think Brown progress should use a critical path analysis because it is a big project and the developers will be able to understand what the tasks are. Also a critical path analysis highlights the deadlines of each task so the developers will know how long they have to complete their task. The critical path analysis shows how long it should take on each task so the developers and Brown progress will know when the project and each task will be finished.</i> The candidate begins with a good positive of CPA – that it shows the minimum time required. This is expanded and contextualised to tie into being able to plan a release date for the project. A negative given is the time it takes to create a CPA leading to less time being available to complete the project and a rushed end result. The conclusion expands on some of the points made. The positive and negative aspects, the reasoned conclusion, some depth to the answer and its contextualisation put this into mark band 3 and it was given 9 marks.  Assessment for learning There are two essays in the paper, one worth 6 marks and one worth 9 marks. These are marked using a level of response mark scheme rather than point marked with the levels being determined by the depth of the candidate's response. Essays such as this require depth of response from the candidate rather than breadth. A few points are required but the

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					candidate is required to show their understanding of the point and its application to the question. Formatting the response can assist this, with each point being made being a separate paragraph; this can help focus the candidate on the point being made rather than moving onto a different one and reducing the depth of their argument and marks given. The use of the highlighter to identify the key points in the question is a technique that has been seen used to great effect.
	b		One mark for identifying a planning consideration that could impact the development Up to two marks for a valid explanation e.g.: Budget (1) • A low budget could only allow for basic features to be developed (1) which means user may not get as much customisation as possible (1) • A high budget means can afford to develop app for number of operating systems (1) so the app will be accessible to more people (1) Constraints (1) • There may only be a small team employed (1) so people will have to do multiple jobs (1) • The system needs to be compatible with many devices (1) which will increase the complexity of programming (1) Legislation (1) • Signing up to the service means compliance to DPA (1) requiring data to be collected/ stored and used correctly (1) • Any films or images used must be cleared (1) for use to comply with the copyright laws (1) Resources (1) • The team may not have a full skill set needed for the project (1) so other	3 (PO2)	Accept equivalent terminology If the identification is not correct, no marks can be awarded. Note – time is not the time taken to do the planning but consideration of time/ deadlines to complete the project. This can be identified and incorporated into constraint. <u>Examiner's Comments</u> The planning considerations are listed in the specification, and this part of the question required a learnt response. Many identified one of the planning considerations. Explanations were less well done with many unable to link their consideration to the context of the new streamline application.

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			people will need to be employed (1) • The company may not own the hardware needed to test the app (1) so it will need to be hired or bought (1) Success criteria (1) • A list of criteria must be met (1) which could increase development costs (1) • All the criteria need to be checked against (1) which could slow down the development of the app (1) Time (1) • A deadline for completion must be met (1) which puts the team under stress to make sure they meet it (1) • If the deadlines are tight parts of the processes may be shortened (1) which could lead the app not working properly (1) Credit any other appropriate response		
			Total	12	

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8	a	Up to two marks for description of one responsibility of Systems Designer One mark for responsibility identified One mark for saying how responsibility contributes to a development e.g.: • Requirements analysis (1) converting the non- technical needs from the client into technical specifications (1) • System architecture design (1) of the overall structure of an application (1) • Data integration (1) to ensure that the data enters, flows through and exits the application properly (1) • Security compliance (1) to ensure that the access rights/ permissions are correct when planning (1) • Performance optimisation (1) to design/ ensure that system works efficiently (1) • Application compatibility (1) across different systems (1) Credit any other appropriate response	2 (PO1)	Accept equivalent terminology This is the system and not the interface <u>Examiner's Comments</u> Many students were unable to differentiate between the system designer and the user interface designer and gave answers that related to the latter. Very few were able to give a responsibility of the system designer.
	b	Up to two marks for description of one responsibility of Project Manager One mark for responsibility identified One mark for saying how responsibility contributes to a development e.g.: • Project planning (1) by scoping the development of an application and planning the tasks (1) • Overview of the project (1) making sure that it is meeting requirements/ budget/ deadlines (1) • Team management (1) by allocating the staff to tasks and activities (1) • Resource/ Time management (1) by assessing any bottlenecks in the processes involved in development (1) • Quality assurance (1) by checking that the application meets the client requirements during its development (1) • Budget management (1) tracking underspend/ overspend (1) • Client liaison (1) keeping the client updated with progress (1) Credit any other appropriate response	2 (PO1)	Accept equivalent terminology <u>Examiner's Comments</u> There was a general acceptance among the candidates that the project manager was responsible for the overview of the project. There was less consensus on what this meant. Some were able to describe and gain the second mark, but many, unfortunately were unable to add detail.

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	c		Up to two marks for each method of gathering client requirements One mark for each method identified One mark for saying how method gathers requirements e.g.: • Focus groups (1) to discuss with users of a system what they require/ need to be addressed (1) • Interviews (1) one on one questions about a client's specific needs // allows off script follow up questions to look in more detail at a requirement (1) • Problem reports (1) by reviewing existing problems in a system to decide on the course of action (1) • Suggestion analysis (1) from feedback forms about user/ client issues and needs for improvements (1) • Questionnaires/ surveys (1) to remotely ask a wide range of users what they would want from the new system/ using closed questions that can be easily analysed (1) • Shadowing (1) engaging/ interacting/ watching the task the staff are doing (1) • Observation (1) watching what the staff are doing (1) Credit any other appropriate response	4 (PO1)	Accept equivalent terminology Not meeting. The second mark needs to be relevant to the method and not generic <u>Examiner's Comments</u> This was very well done with most candidates both able to identify two different methods but also to describe them. There was a small number of candidates who gave meeting as one of the methods, even though this had been given in the question.
			Total	8	

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9	a	Up to two marks for each non-functional requirement explained One mark for each non-functional requirement identified One mark for saying how it meets BournStreaming needs e.g.: • Should support 1 million concurrent users (1) to allow for growth of the application without causing issues of capacity (1) • Adaptive resolution based on user's internet connection (1) to allow users on a variety of devices/ connections to access the application easily (1) • Reliability / 99.9% uptime over 30 day period (1) to maintain customer satisfaction and continued use of the app (1) • Use of open-source technologies (1) to help keep the BournStreaming development costs down. (1) • Comply with legislation (DPA) (1) by having security measures such as passwords to protect personal data (1) • Six-month delivery (1) so that BournStreaming can enter the marketplace when they want to launch (1) • Monthly milestones (1) so that BournStreaming are up to date with/ sign off on the progress of the development (1) Credit any other appropriate response	4 (PO2)	Accept equivalent terminology Responses must link to application being developed in the brief provided <u>Examiner's Comments</u> There were two aspects to this question, the ability to identify non-functional requirements and having achieved this, to be able to explain the requirement. For some, it seemed like they were guessing and the difference between functional and non-functional was not well known. A small percentage of the candidature gave answers that were not related to the context or scenario. Those that did manage to correctly identify non-functional requirements often just gave the requirement and did not attempt an explanation limited the marks they could be awarded.

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	b	Any one from e.g.: • Support on-demand streaming (1) • Content organised by genre/ language/ popularity (1) • Ability to create multiple user profiles under a single account (1) • Integrated parental control features for child-safe viewing (1) • Comply with DPA (1) Credit any other appropriate response	1 (PO2)	Accept equivalent terminology <u>Examiner's Comments</u> For many candidates, as with Question 9 (a), this seemed to be a guess. Some guessed right and were credited with the mark, others were less fortunate. It is important that their answers come from the given text and is not made up.  Misconception Non-functional requirements describe the level of quality, constraints or characteristics such as performance, security, usability and reliability. Functional requirements are descriptions of what the system should do. They define features, behaviours or functions.

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	c	Answer Level 3 (high) 5-6 marks a thorough analysis, which includes: • identification of a range of points from both sides of the analysis • detailed knowledge and understanding in the context of the question • clear explanation • consistent use of appropriate subject terminology. Level 2 (mid) 3 – 4 marks An adequate analysis, which includes: • identification of some points from either/ both sides of the analysis • some knowledge and understanding in the context of the question • adequate explanation • some use of appropriate subject terminology. Level 1 (low) 1-2 marks A basic analysis, which includes: • identification of at least one point • limited knowledge and understanding in the context of the question • basic explanation • use of appropriate subject terminology is limited. 0 mark Answer is not worthy of credit	6 (PO3)	Indicative content Answers can include some of the following: Advantages of using open application software e.g.: • Access to source code so can customise • Community support and collaboration • Cross- platform compatibility • Free/ low cost • High reliability and stability • No lock into a specific vendor • Transparency as you can inspect the code for any hidden risks Disadvantages of using open application software e.g.: • Documentation provided may be inconsistent/ poor • Integration/ compatibility issues to some platforms • Legal risk and license complexity • Limited official support/ help desk • Possible security risks due to open access to code • Steep learning curves to configure as required Credit other relevant conclusions, points and examples. <u>Examiner's Comments</u> This was the second piece of extended writing that candidates were required to do. The analyse question, for 6 marks, is a permanent style of question for this paper. Candidates are being asked to do three things. To look at advantages, to look at disadvantages and to apply their answers to the scenario. Analyse as a keyword requires an explanation in the context of the question. Many candidates identified and described but few analysed.

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	d		Up to two marks for description of advantage of bespoke software One mark for advantage identified One mark for describing the advantage e.g.: • Made specific to needs/ customised (1) so software will work in the designed workflow more efficiently (1) • Has increased flexibility (1) so that the development can be altered more easily as it progresses (1) • Reduced bloatware (1) leading to less features that are not required increasing the size of the application file (1) • No unnecessary features (1) slowing the system/ processing (1) • Improved integration (1) as the software is designed to work with the organisations existing systems (1) • Long term cost efficiency (1) as there will be no long-term fees requiring payment to external organisations. (1) Credit any other appropriate response	2 (PO1)	Accept equivalent terminology <u>Examiner's Comments</u> Most candidates were able to achieve 1 mark with many able to describe and advantage and gain the second mark. Answers focused on customisability and meeting of requirements.
			Total	13	