



Mark Scheme

Additional Sample Assessment Materials

Pearson Edexcel International Advanced Level in
Information Technology

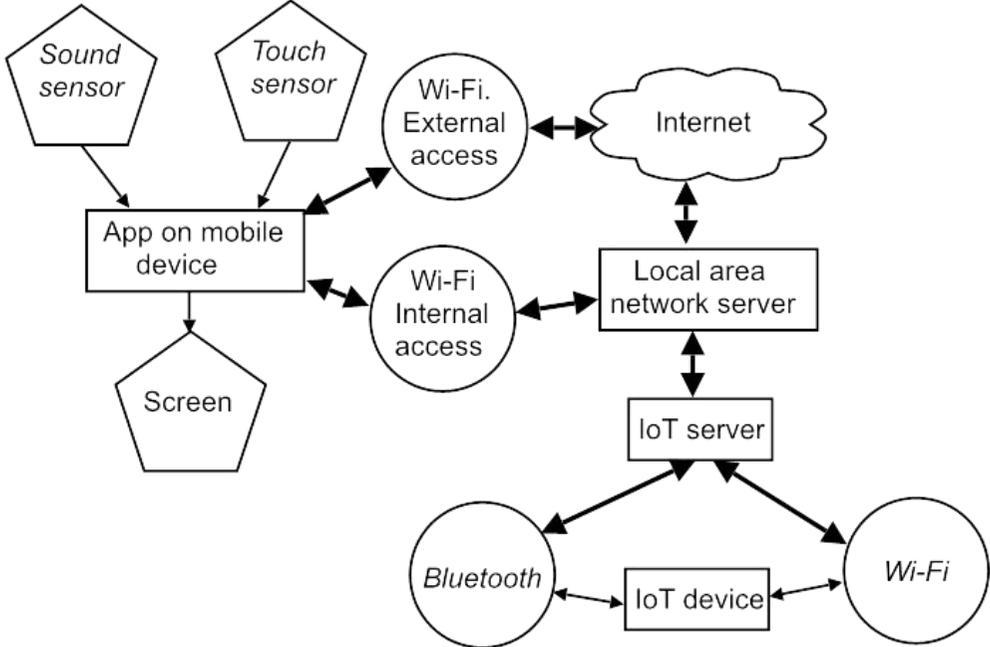
Unit 3 (WIT13)

Unit 3 AddSAM – Mark Scheme

Question number	Answer	Additional guidance	Mark
1 (a)	Award one mark for each method. <ul style="list-style-type: none"> • symmetric encryption • asymmetric (public-key) encryption 	Do not allow named encryption algorithms	2

Question number	Answer	Additional guidance	Mark
1 (b)	Award up to two marks for each linked explanation. Such as: <ul style="list-style-type: none"> • embedded systems are much smaller than general purpose computers (1) so they will fit into small objects/devices (1) • embedded systems do not have to 'boot up' from a storage device (1) so are faster loading/start up more quickly (1) • embedded systems use less resources than general purpose computers (1) so do not need connections to resources / can be smaller (1) • embedded systems use less power than general purpose computers (1) so can operate in battery powered/low powered situations (1) • embedded systems are much less complex than general purpose computers (1) so are easier to mass produce (1) 	Must be a linked explanation to award two marks in each case.	4

Question number	Answer	Additional guidance	Mark
1 (c)	<p>Award one mark for each point up to a maximum of four marks for a linked explanation. Answers may include:</p> <ul style="list-style-type: none"> • learns noise types • to filter them out • learns human / voice characteristics / frequencies • to enhance them • so can ignore everything else • learns (characteristics of) key / command words • so can pick them out (of background) • so can ignore other words / speech • can improve/adapt over time / with more practice <p>Example answers</p> <p>The software learns to separate out human speech (1) from background noise (1) and can enhance the voice signal to make it clearer (1). It would adapt over time (1) (to the environment it is in).</p> <p>The software learns background noise types (1) so that it can ignore them (1) allowing it to pick out human speech (1) and enhance it (1).</p> <p>With continual practice (1) the software will learn the characteristics of the human voice (1) and other noises (1) so that it can differentiate between speech and background noise (1).</p>		4

Question number	Answer	Mark
1 (d)	<p>Award one mark each for:</p> <ul style="list-style-type: none"> • sound sensor / microphone (1) • touch sensor / touchscreen (1) • Bluetooth (1) • Wi-Fi (1) • completing all links (ignore arrows) (1) • all arrows correct (1)  <pre> graph TD SS[Sound sensor] --> App[App on mobile device] TS[Touch sensor] --> App App --> S[Screen] App <--> WFE((Wi-Fi External access)) App <--> WFI((Wi-Fi Internal access)) WFE <--> Internet((Internet)) WFI <--> LAN[Local area network server] Internet <--> LAN LAN <--> IOT[IoT server] IOT --> BT((Bluetooth)) IOT --> WiFi((Wi-Fi)) BT <--> IOTD[IoT device] WiFi <--> IOTD </pre>	6
Total for question 1		16

Question number	Answer	Mark
2 (a)	<p>BCP deals with 'what could go wrong' and identifies alternative ways of keeping essential / critical parts of the business going</p> <ul style="list-style-type: none"> deals with the physical aspects, e.g. loss of the IT centre plans for extra staff / third party requirements for emergencies e.g. widespread illness, severe weather preventing staff movement deals with digital aspects, e.g. data loss, communications loss anticipates wide range of scenarios e.g. fire, flood, cyber attack, power loss defines priorities for a range of possible events sets timescales and objectives for recovery from a range of possible events includes a disaster recovery plan dealing with restoration of services and operations, e.g. IT, communications, power 	6
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> Demonstrates limited knowledge and understanding, some of which may be inaccurate. Applies understanding with limited coherence to produce a superficial and unbalanced discussion.
Level 2	3-4	<ul style="list-style-type: none"> Demonstrates knowledge and understanding which is mostly relevant but may include some inaccuracies. Applies understanding to make some coherent connections, leading to a discussion that shows some development, but may be unbalanced.
Level 3	5-6	<ul style="list-style-type: none"> Demonstrates accurate and relevant knowledge and understanding throughout. Applies understanding coherently to produce a balanced and fully developed discussion.

Question number	Answer	Additional guidance	Mark
2 (b)	<p>Award one mark for 2 factors Award two marks for 4 factors Award three marks for 6 factors</p> <p>Answers may include:</p> <ul style="list-style-type: none"> backup medium backup location timings which data / files need to be backed up who is responsible for running backup / automation system data transfer speed available security of store security of transfer available hardware / cost of new hardware method for testing the backups / system 	Do not award a mark for how much data needs to be backed up / storage space needed.	3

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2 (c)	<p>Gantt chart.</p> <p>Award one mark for:</p> <ul style="list-style-type: none"> • dates / calendar • plausible time scales for all 7 tasks. Tasks 3 & 6 may start later than 6th June • at least two dependencies. May be start - start or finish - start • at least two constraints • four constraints • chart gives a clear overview of the project <table border="1"> <thead> <tr> <th colspan="2">Task details</th> <th colspan="22">Date</th> </tr> <tr> <th>Task num.</th> <th>Constraints</th> <th>May</th> <th>June</th> <th></th> </tr> <tr> <td></td> <td></td> <td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>2</td> <td>Needs catalogue</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>3</td> <td>Needs first departmental list</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>4</td> <td></td> <td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>5</td> <td>Needs all file lists</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>6</td> <td>Needs first list</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td> </tr> <tr> <td>7</td> <td>Needs first list and DVDs</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td></td> </tr> </tbody> </table>	Task details		Date																						Task num.	Constraints	May	June				24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	1			x	x	x	x	x	x	x	x	x	x	x	x																		2	Needs catalogue														x	x	x	x	x	x	x	x										3	Needs first departmental list														x	x	x	x	x	x	x	x	x	x								4			x	x	x	x	x	x	x	x	x	x	x	x																		5	Needs all file lists																						x	x	x							6	Needs first list															x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		7	Needs first list and DVDs																						x	x	x	x	x	x	x			6
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Question number	Indicative content	Mark
3	<p>Responses should be in the context of the web page as evidenced in the image and brief.</p> <p>Problems</p> <ul style="list-style-type: none"> • page size, too wide to view on standard monitor/screen without scrolling • navigation bar, not visible without sideways scroll or viewing screen at 50% or less • cycling colours on title, distracting and annoying • 10 GIFs run on page load, slowing load time, distracting and annoying • GIFS and title are overuse of colour and movement (too much on one screen) • popups can be annoying and may not work correctly, many browsers have anti-popup settings • method of changing the music is likely to cause accessibility problems. Also more unwanted movement on the screen causing distraction • there does not seem to be any way of muting the music • over busy screen, too much happening at once <p>Solutions</p> <ul style="list-style-type: none"> • Page size <ul style="list-style-type: none"> ○ consider target device ○ have active pages that change width ○ use page size that is small enough / sized for most common devices • Navigation bar <ul style="list-style-type: none"> ○ place bar top left or top of page ○ have bar in floating panel that is always visible • Colours <ul style="list-style-type: none"> ○ avoid having too many colours, recommended maximum is 4 per page for non-image material ○ avoid flashing / cycling colours. These are attention seeking techniques and should only be used for one, important item per page ○ avoid having too great/small an intensity range • Page loading <ul style="list-style-type: none"> ○ takes too long if everything loads at once, consider using static thumbnails for GIFs and only load them on-click • Music <ul style="list-style-type: none"> ○ do not use the animated bee as a default method for controlling the music. Users with motor control problems may not be able to use it. ○ provide a method for stopping the music 	12

	<ul style="list-style-type: none"> • GIFs <ul style="list-style-type: none"> ○ do not load them all when page loads, use static images or icons ○ run GIFs within the page to prevent popups, or alert the user that the GIFs will require a popup ○ ensure GIFs return to static image / icon when they have finished running • Screen too busy <ul style="list-style-type: none"> ○ mainly covered by previous items <p>Conclusion.</p> <ul style="list-style-type: none"> • Comparison of solutions / suggest best solutions 	
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Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-4	<ul style="list-style-type: none"> • Demonstrates limited knowledge and understanding, some of which may be inaccurate. • Applies understanding with limited coherence to produce a response that lacks development. • Demonstrates limited awareness of competing arguments. • Conclusion, if present, is generic or unsupported.
Level 2	5-8	<ul style="list-style-type: none"> • Demonstrates knowledge and understanding, which is mostly relevant and may include some inaccuracies. • Applies understanding to make some coherent connections and a partially developed response. • Demonstrates some awareness of competing arguments, but this may be unbalanced, and partially supports conclusion with evidence.
Level 3	9-12	<ul style="list-style-type: none"> • Demonstrates accurate and relevant knowledge and understanding throughout. • Applies understanding coherently to produce a fully developed response. • Demonstrates an awareness of competing arguments and supports conclusion with evidence.
Total for question 3		12

Question number	Answer	Mark															
4(a)	<p>Award one mark for:</p> <ul style="list-style-type: none"> • Product table • Manufacturer table • Product_detail table • Size table • Colour table • Gender table • Indication of primary keys (Product, Manufacturer) • Indication of primary keys (Size, Colour, Gender) • Indication of foreign key (Manufacturer_ID in Product) • Indication of composite key in Product_detail (or equivalent) • Indication of foreign keys in Product_detail (or equivalent table) • Fully normalised. <p>Product</p> <table border="1"> <tr> <td><u>Product_ID</u></td> <td>Product_name</td> <td>Manufacturer_ID *</td> </tr> </table> <p>Manufacturer</p> <table border="1"> <tr> <td><u>Manufacturer_ID</u></td> <td>Manufacturer</td> </tr> </table> <p>Product_detail</p> <table border="1"> <tr> <td><u>Product_ID *</u></td> <td><u>Size_ID *</u></td> <td><u>Colour_ID *</u></td> <td><u>Gender_ID *</u></td> </tr> </table> <p>Size</p> <table border="1"> <tr> <td><u>Size_ID</u></td> <td>Size</td> </tr> </table> <p>Colour</p> <table border="1"> <tr> <td><u>Colour_ID</u></td> <td>Colour</td> </tr> </table> <p>Gender</p> <table border="1"> <tr> <td><u>Gender_ID</u></td> <td>Gender</td> </tr> </table> <p>Alternative answer using parenthetical format</p> <p>Product(ProductID, ProductName, ManufacturerID*) Manufacturer(ManufacturerID, ManufacturerName) Colour(ColourID, ColourName) Size(SizeID, SizeDescription) Gender(GenderID, GenderDescription) Garment(GarmentID, ProductID*, ManufacturerID*, ColourID*, SizeID*, GenderID*)</p>	<u>Product_ID</u>	Product_name	Manufacturer_ID *	<u>Manufacturer_ID</u>	Manufacturer	<u>Product_ID *</u>	<u>Size_ID *</u>	<u>Colour_ID *</u>	<u>Gender_ID *</u>	<u>Size_ID</u>	Size	<u>Colour_ID</u>	Colour	<u>Gender_ID</u>	Gender	12
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Question number	Answer	Additional guidance	Mark
4(b)	<p>Award up to two marks for each of two linked explanations.</p> <p>Explanations may include:</p> <ul style="list-style-type: none"> • to identify customers that are likely to purchase a product/specified item of clothing (1) so that they can be given incentives (to buy matching items/accessories) (1) • to predict peak demand periods / fluctuations in demand (times of the year)(1) to improve stock control/customer service (1) • to predict changes to purchasing patterns (changes in popularity/fashion)(1) so that stock levels can be adjusted (1) • to predict demand for goods, so that just in time stock control can be practised (1) resulting in less cash being tied up in stock (1) 		4
Total for question 4			16

Question number	Answer	Mark
5(a)	<p>Award one mark for each point up to a maximum of three marks for a linked explanation.</p> <p>Such as:</p> <ul style="list-style-type: none"> • has a clear structure / defined steps (1) each step must be completed before moving on (1) so problems have to be dealt with / cannot be pushed aside for later (1) • has an end goal from the start (1) so team has a focus from the start (1) so are less likely to deviate/be sidetracked (1) • methodical with good documentation of information/data/project details between steps (1) enabling/allowing team/personnel changes between steps (1) without needing people to redo/review/experience previous steps (1) 	3

Question number	Indicative content	Mark
5(b)	<p>Responses should be in the context of the waterfall project management technique being used for developing a specification document for a website.</p> <ul style="list-style-type: none"> • this is Stage 1 of the Waterfall method, requirements, • stakeholders; people who will run and/or maintain the website, people commissioning the website, potential users / customers • methodologies; interviews, briefing documents, focus groups, investigating similar sites • getting details / requirements of the required website (what it will do) • constraints; financial, time, personnel • analysing requirements • resolving conflicts of requirements • finding system requirements, min and recommended system to work on the project. • design the specification document 	6

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates limited knowledge and understanding, some of which may be inaccurate. • Applies understanding with limited coherence to produce a superficial and unbalanced discussion.
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates knowledge and understanding which is mostly relevant but may include some inaccuracies. • Applies understanding to make some coherent connections, leading to a discussion that shows some development, but may be unbalanced.
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and relevant knowledge and understanding throughout. • Applies understanding coherently to produce a balanced and fully developed discussion.
		Total for question 5
		9

Question number	Answer	Mark
6	<p>Responses should be in the context of a distributed database for a power company.</p> <p>Advantages.</p> <p>Costs:</p> <ul style="list-style-type: none"> • distribution involves a number of relatively cheap, extra machines • the alternative is upgrading the original hardware, this is likely to be more expensive • upgrading faces diminishing returns and it may be impossible / impractical to purchase better hardware <p>Reliability:</p> <ul style="list-style-type: none"> • distributed systems are inherently more reliable, if one machine / cluster / data centre is damaged, the rest of the system will still function • less latency, queries will be directed to the nearest machine, decreasing response times <p>Convenience</p> <ul style="list-style-type: none"> • easy scaling. Simple to add / subtract machines in response to workload • availability, no downtime as machines can be taken out of the system for maintenance, etc. without affecting the system as a whole. <p>Disadvantages.</p> <p>Problems and pitfalls</p> <ul style="list-style-type: none"> • CAP. Consistency, availability, partition tolerance. Pick any two. Usually partition tolerance plus one. (partition tolerance means that the system must be able to survive loss of connection / messages between its parts) • weak consistency means updates made on one machine take time to propagate, resulting in potential errors on queries at other machines • choosing high consistency will slow response time, may paralyse the system as changes must propagate before responses can be made. <p>Conclusion</p> <ul style="list-style-type: none"> • balance of consistency with cost, reliability, availability • expansion plans indicate that further upgrades to server system may be infeasible within a few years • distributed database can be scaled more easily but will always have data consistency problems 	12
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	<ul style="list-style-type: none"> • Demonstrates limited knowledge and understanding, some of which may be inaccurate. • Applies understanding with limited coherence to produce a response that lacks development. • Demonstrates limited awareness of competing arguments. • Conclusion, if present, is generic or unsupported.
Level 2	5–8	<ul style="list-style-type: none"> • Demonstrates knowledge and understanding, which is mostly relevant and may include some inaccuracies. • Applies understanding to make some coherent connections and a partially developed response. • Demonstrates some awareness of competing arguments, but this may be unbalanced, and partially supports conclusion with evidence.
Level 3	9–12	<ul style="list-style-type: none"> • Demonstrates accurate and relevant knowledge and understanding throughout. • Applies understanding coherently to produce a fully developed response. • Demonstrates an awareness of competing arguments and supports conclusion with evidence.
Total for question 6		12