Mark Scheme (Results)

Summer 2022

Pearson Edexcel International Advanced Level
In Information Technology (WIT13/ 01)
Unit 3

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer	Additional guidance	Mark
1(a)i	Award **one** mark for: • International Standard Book Number (ISBN) (1) • book_ID (1) • product identification code/number (1) • European Article Number (EAN) (1) • Global Trade Item Number (GTIN) (1) • Stock code (1) • Barcode (1) • Credit card PIN (1) • Customer account ID (1)	Do not allow price, cost, etc.	**1**
1(a)ii	Award **one** mark for: • customer details/contact information eg phone number (1) Name is not enough • account details (1) • customer/delivery/billing address (1) • One time transaction passcode/other verification (1) • email address (1) • CVV/ card verification value/ card expiry date/name on the card /credit card information (1)		**1**

Question number	Answer	Additional guidance	Mark

1 (b) i	Award up to **two** marks for a linked explanation such as:
	
	• allows the analysis of sales data so that: (1)
	  ○ buying trends can be identified (1)
	  ○ special offers/sales can be planned (1)
	  ○ stock levels can be adjusted to avoid overstock/restricting cashflow (1)
	• allows (targeted) marketing so that: (1)
	  ○ customers can be offered linked products (upsold) (1)
	  ○ customers can be invited to (suitable) events (1)
	• allows (targeting of) offers/incentives/loyalty schemes so that: (1)
	  ○ customer service/satisfaction is improved (1)
	  ○ customer retention/repeat custom is improved (1)
	
	Example:
	
	The retailer can analyse sales trends (1) and adjust stock levels in order to avoid having too much capital tied up in books sitting in the warehouse / free up money to invest in fast-selling/popular books. (1)
		Look for 1 bullet and one sub-bullet
		Mix and match is OK, even as two sub-bullets, as long as it makes a linked explanation
			2

1 (b) ii	Award **one** mark for each point up to a maximum of **two** marks: • their personal/purchase/card information may be misused/sold/stolen (1) • they may be sent spam/unwanted marketing material (1) • they may be phished/scammed into giving away personal information (1) • criminals may combine the information with other material to commit identity theft/fraud (1)		**2**

Question number	Answer	Additional guidance	Mark
1 (c)i	Award **one** mark for each point up to a maximum of **two** marks: • removing data duplications/redundancies /normalising(1) • access controls (on data/database) (1) • keeping audit trails (1) • keeping backups (of the data) (1) • least privileges policy (1) • validation of data (other than on input) e.g. validation of data moving between two databases (1)		**2**

1 (c)ii	Award up to **two** marks for a linked description such as: • it is kept offline/in long term storage/in the cloud (1) • in a different location (1) • it may be (highly) compressed (1) eg uses zip etc. • it may be held on slow access media (1) allow examples eg tape • it takes time to bring the data back into use/online (1)		**2**
1 (c)iii	Award **one** mark for: • user rights and responsibilities (1) • account/password sharing/access rights (1) ie, don't let others use your till account • logon/logoff requirements / system security (1) • acceptable use of company IT system/data (1) • penalties for improper use (1)	Accept other sensible answers that are related to operating an EPOS/sales system Ignore access rights/ customer privacy	**1**
1 (c)iv	Award one mark for: • a number (0-9), an uppercase letter (A-Z), a lowercase/simple letter (a-z) (1) • Password length must be at least 8 (1)	Ignore reference to other types of character, eg. £$%^	**2**

Question number	Answer	Additional guidance	Mark
1d	Award up to **two** marks for a linked explanation such as: • damage to the data centre/communications links (1) would keep an otherwise operational shop from restoring/fixing faulty data (1) • the local backup can be used to restore damaged data (1) because it is faster/more responsive than restoring via the data centre (1) • in the event of damage to the **local storage** device (1) the data can be restored/is still available using the copy kept at the external data centre (1)	Ignore generic reasons for having backups without further explanation Eg for disaster recovery/in case of fires	**2**
		Total for question 1	**15**

Question number	Answer	Mark
2 (a)	Award **one** mark for each to a maximum of **six** marks: 1. correct start date (1) 5th July 2. plausible time scales for at least 6 tasks (1) Allow early dates, not before 5th, but no over run unless bracketed 3. at least two dependencies (1) 4. double dependency for task 5 (1) 5. at least two constraints (1) Allow Start when hardware is in place . Allow move files after review 6. at least four constraints (1) Allow Project manager to check 7. indication of possible overrun on task 8 (1) Allow indication as a constraint	6

Task details		July																			
		Date																			
Task num.	Constraints	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1						X	X	X	X	X											
2	Needs size of files										X										
3						X	X	X	X	X	X										
4	Needs hardware										(X)	X	X	X							
5	Needs reviewed files and storage space										X	X	X	X	X	X					
6	Project Manager must be available															X					
7																	X				
8	Needs completed physical move																	X	X	(X	X)

<table>
<tr><th>Question number</th><th>Answer</th><th>Additional guidance</th><th>Mark</th></tr>
<tr><td>2 (b)</td><td>
The table is an example of what the candidates might produce. Other content is acceptable.

Award 1 mark for each point to a maximum of 6 marks:

1. At least 8 data types are appropriate (1)
2. Primary key (warranty number or toolID) is shown (1)
3. All their text field lengths are appropriate (int fields do not need a length) (1)
4. Email field validation is correct (1)
5. Warranty number validation is correct (1)
6. Date validation is correct (1)
7. Date field size is 10 (1)

<table>
<tr><td>Table name</td><td colspan="3">Tbl_Warranty</td><td rowspan="2">Validation</td></tr>
<tr><td>Attribute / field name</td><td>Data type</td><td>Primary key</td><td>Field size</td></tr>
<tr><td>warranty number</td><td>text</td><td>Yes</td><td>9-20</td><td>Display as LLNNNNNNN
allow LL0000000</td></tr>
<tr><td>toolID</td><td>text/int/number</td><td>OR YES</td><td>4-10</td><td></td></tr>
<tr><td>tool</td><td>text</td><td></td><td>6-20</td><td></td></tr>
<tr><td>make</td><td>text</td><td></td><td>8-20</td><td></td></tr>
</table>
</td><td>Allow any sensible consistent validation.

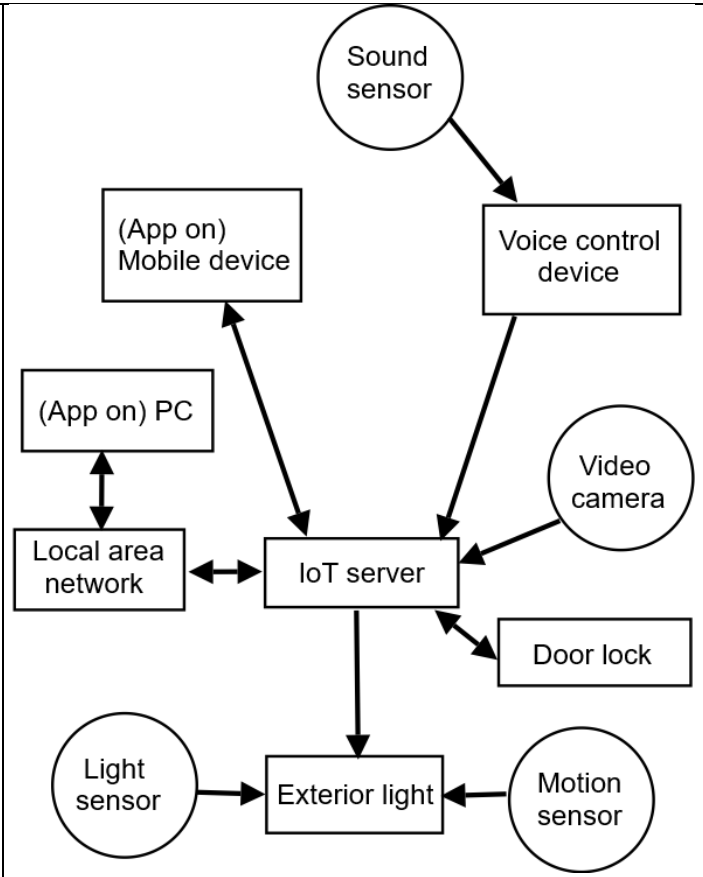
Data type could also be VARCHAR if field content is variable.

CHAR if length is fixed,

STRING instead of text.</td><td>6</td></tr>
</table>

	model	text		6-20			
	supplierID	text		5-10			
	supplier email	Text allow hyperlink		19-50	Display as %_@__%.__% allow text@text.text allow *@*.*		
	when purchased	date		10 / format	Display as DD/MM/YYYY		
	purchase price	currency		8-10/format			
						Total for question 2	**12**

Question number	Answer	Additional guidance	Mark
3a	1. sound sensor linked to voice control unit (1) 2. voice control device linked LAN/IoT server (1) 3. sound sensor – voice control – LAN/IoT is one way, from sensor to LAN/IoT (1) need both links 4. motion sensor linked to light (1) 5. light sensor linked to light (1) 6. LAN/IoT server linked to light (1) 7. All links to light are one way, to the light (1) need at least two of motion, light sensors, LAN/IoT ignore other links 8. (app on) mobile device/PC linked to LAN/IoT server (1) 9. (app on) mobile device/PC link is two way (1) 10. door lock linked to LAN/IoT server (1) 11. door lock link is two way (1)	Ignore extra links for connection marks. 1,2,4,5,6,8,10 All links must be correct for arrow direction marks 3,7,9,11	**9**

	 **Indicative content**		
3b	Common issues, e.g.: • weak/default/no passwords applied by manufacturers • difficulty in changing passwords on devices, may not be possible for some • use of mesh WiFi to operate devices gives easy/wide network accessibility • other IoT interfaces may be poorly documented/easy to hack • lack of/slow update/patch issue by manufactures • easy to add/replace devices so risk of unpatched/unsecured device being put into secured system. Items specific to the system: • video camera • lock • light		**6**

	• IoT server System security: • check passwords and put complex ones on each device • don't use devices where password is fixed/hardcoded • ensure latest patches/updates are obtained and installed before putting an item into the system • disable WiFi/only use cable connections • physical security on devices so they cannot be simply swapped out.			

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• 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	• 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	• Demonstrates accurate and relevant knowledge and understanding throughout. • Applies understanding coherently to produce a balanced and fully developed discussion.
		Total for question 3 **15**

Question number	Indicative content	Mark
4(a)	Responses should be in the context of a Sarah's workstation as evidenced in the image. Hazards • Keyboard. Both laptop and desktop keyboards are flat and in poor positions relative to the seat. Risk of rsi. • Chair. Not ergonomic / adjustable, poor back support, liable to produce pressure points, result in poor posture. • Monitors / screens. Desktop set too high, eye level should be near top of screen. Laptop too low. • Lighting. Obvious reflections on the desktop monitors, work lamp to the right of the image does not seem to be height adjustable. Sarah will be facing a window. • Cluttered desk or a desk too small. Solutions • Keyboard o Sarah should place the keyboards in a position that allows the forearms to be close to the horizontal and the wrists to be straight. o Laptop may need to be placed on a stand. o Desktop keyboard could be replaced by an ergonomic one. o She could get wrist rests/ support pads. • Chair o get an adjustable chair and set it up ▪ knees >90 degrees ▪ feet flat on floor or use a footrest ▪ backrest / back support adjusted to support lumbar region / lower back • Monitors o set eye to screen distance to be the same for all the monitors o distance should permit easy focus, usually about arm's length o top of screen not above eye level o bottom of screen not requiring head tilt to focus on it • Lighting o turn workstation so window light comes from the side, not behind the monitor o avoid glare / reflection by ▪ using anti-glare screen filter ▪ tilt top of screen to move glare / reflection from eye line ▪ move / adjust / replace room lighting • Clutter o Get a bigger desk o Tidy the desk o Avoid liquids	**12**

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	• 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	• 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	• 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.

<table>
<tr><th>Question number</th><th></th><th>Mark</th></tr>
<tr><td>4(b)</td><td>(b) Sarah lives in a small apartment.
She moving to a larger apartment in the same town.
She has arranged to have a weekend off from work and for a moving company to transfer all her belongings on Saturday 2nd July.
Her objective is to complete the move and set up her home office during the weekend so that she is ready for work on Monday morning.
Complete the SMART targets table by stating how Sarah's objective meets each of the criteria.
(3)
<table><tr><th>Criteria</th><th>How the objective meets the criteria</th></tr><tr><td>Specific</td><td>Sarah has set the specific objective of completing the move and office set up to be ready for work on Monday morning, 4 July.</td></tr><tr><td>Measurable</td><td>The objective can be measured by completing the move on Saturday, completing the set up on Sunday, having the home office ready to use on Monday.</td></tr><tr><td>Achievable</td><td>The objective is achievable if the moving company completes the transfer on time.</td></tr><tr><td>Relevant/realistic</td><td>The objective is relevant because Sarah needs to be able to complete the move without it interfering with her work.
OR realistic, as moving a 'small apartment' should not involve more than a day's work and setting up a home office should only take a few hours.</td></tr><tr><td>Time bound</td><td>The objective is time-bound because Sarah must complete the move over a specified weekend and be ready for the Monday morning.</td></tr></table></td><td>3</td></tr>
<tr><td colspan="2">Total for question 4</td><td>15</td></tr>
</table>

5(a)	Award **one** mark for each point up to a maximum of **two** marks for a linked description. • (software) development/writing is divided into sequences of repeated cycles (1) • each cycle/iteration has a fixed length/time-box (1) • each cycle/iteration includes all the (development) stages/the plan, design, check, adjust phases (1)		**2**
5(b)(i)	Award **one** mark for any of: • a framework/process/rules that helps teams work together (1) • a framework/process/rules for managing product/software development (1)		**1**
5(b)(ii)	Award **one** mark each to a maximum of **two** marks for: • time-boxed / has fixed start and finish dates (1) • runs sequentially/can only have one sprint at a time (1) • has pre-planned/measurable goals (1)		**2**
Question number	**Indicative content**		**Mark**
5(c)	Responses should be in the context of the requirements and planning for a fleet and route management agile software project **Requirements:** • create requirements document(s) • existing problems • end result, what the project is going to achieve • software features, what it will support e.g. types of machine/tool/task • software features, what it will NOT support • keep requirements as simple as possible, features may be added in later versions, avoid mission creep • prioritise the requirements • identify team members and resources **Planning:** • team meetings, with the product owner/sponsor to clarify requirements • team meetings, to build the team, analysing project requirements • arrange scrum master role(s) • model the software/system/project architecture • plan/set up the environment, workstations, software tools, workspace • make first estimates for the project's progress • plan first iteration/sprint/set of coding tasks.		**6**

Level	Mark	Descriptor	
	0	No rewardable material.	
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Level 2	3–4	• 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	• Demonstrates accurate and relevant knowledge and understanding throughout. • Applies understanding coherently to produce a balanced and fully developed discussion.	
		Total for question 5	**11**

Question number	Answer	Mark
6	Responses should be in the context of Electronic Health Records (EHRs) Descriptive analytics asks what happened in the past. e.g. looks at historical data on disease, annual cycles, long term trends, rise and fall correlated with different treatments, possible causes. Prescriptive analytics asks what is happening now. e.g. looks at current data/recent data to see how something is unfolding and producing recommendations/best guess/possib of research or treatment. Predictive analytics asks about the future. e.g. looks at past/current data to find patterns that can be interpolated into the future. Prediction of disease trends, epidemi forecasts of required infrastructure/medical needs/staffing requirements. Uses/benefits for citizens: • medical history can be analysed to predict possible future problems • current treatment can be analysed to see what changes may be beneficial • benefit from planning for e.g. mass screening for cancer, delivery of seasonal vaccines Uses/benefits for healthcare workers. As for citizens, plus: • helps with diagnosis/decision making • helps manage resources, e.g. planning for bed spaces, future recruitment and training, medical supplies • helps forward planning for e.g. non-urgent surgery, health campaigns	**12**

	Uses/benefits for governments: • data can be analysed to predict healthcare needs by area/other demographic • data can be analysed to reveal developing/historical problems at the population level • may reduce costs by reducing redundancy in record keeping/data systems • healthcare data can be repurposed/combined with other information to aid government decisions on non-healthcare matters. Types of tools. Tool names should not be expected but some common ones are: • Hadoop, most-used distributed database and database analysis tools • MongoDB, non-SQL database system • Google Analytics, used for web traffic analysis but probably the most well known name. There are many more commercial and open source packages available. Common tool functions. • producing reports, dashboards, visualisations, charts, graphs • natural language search, text analysis • machine learning • statistical analysis • modelling and simulations • data integration/import and export to other software • data security. **Conclusion** **There is no 'correct' conclusion.** **Conclusions should be supported by arguments in the rest of the answer.**	

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	• 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	• 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	• 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

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