T Level Technical Qualification in Digital Production, Design and Development

Mark Scheme

Core Paper 2: The Business Environment

Autumn 2024

General Marking Guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Learners 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.
- 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. Examiners should also be prepared to award zero marks if the learner's response is not rewardable according to the mark scheme.
- Where judgement is required, a mark scheme will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the mark scheme to a learner's response, a senior examiner should be consulted.
- Crossed out work should be marked unless the learner has replaced it with an alternative response.
- Accept incorrect/phonetic spelling (as long as the term is recognisable) unless instructed otherwise.

Points-Based Mark Scheme Guidance

Points-based mark schemes are made up of:

1. Mark scheme rubric

   A mark scheme rubric instructs an examiner as to how each mark is awarded.
2. Example Responses

   These demonstrate the type of acceptable responses that a student might provide and where each mark is awarded.
3. Additional marking Guidance

   This informs examiners about any parameters which should be applied e.g. 'accept any other appropriate/alternative responses.

Applying the points-based mark scheme guidance

Examiners should follow the mark scheme rubric and use the example responses as a guide for the relevance and expectation of the responses. Students must be credited for any appropriate response. Should candidates provide answers that meet the rubric but in an alternative order, credit should be given.

Levels-Based Mark Scheme Guidance

Levels-based mark schemes (LBMS) have been designed to assess students' work holistically. They consist of two parts:

1. Indicative content

   Indicative content reflects content-related points that a student might make but is not an exhaustive list. Nor is it a model answer. Students may make some or none of the points included in the indicative content as its purpose is as a guide for the relevance and expectation of the responses. Students must be credited for any appropriate response.

2. Levels-based descriptors

   Each level is made up of a number of traits which when combined together articulate the quality of response that a student needs to demonstrate. The traits progress across the levels to demonstrate the different expectations of each level. When using a levels-based mark scheme, the 'best fit' approach should be used.

Applying the levels-based descriptors

Examiners should take a 'best fit' approach to determining the mark.

- Examiners should first make a holistic judgement on which level most closely matches the student's response. Students will be placed in the level that best describes their answer. Answers can display characteristics from more than one level, and where this happens markers must use any additional guidance (e.g. weighting of traits) and their professional judgement to decide which level is most appropriate.
- The mark awarded within the level will be decided based on the quality of the answer and will be modified according to how securely all traits are displayed at that level:
  - Marks will be awarded at the top of that level if the student has evidenced each of the descriptor traits securely.
  - Where the response does not securely meet all traits, the marks should be awarded based on how closely the descriptor has been met.

Section A

Question Number	Answer	Mark
1(a)	Award one mark for each correctly named layer up to a maximum of two marks. • application layer • presentation layer • session layer • transport layer • network layer • data link layer • physical layer	(2)

Question Number	Answer	Mark
1(b)	Award one mark for each correctly named type up to a maximum of two marks. • Facial recognition • Fingerprint recognition • Voice analysis • Iris/Retina scanning Accept any other appropriate response.	(2)

Question Number	Answer	Mark
1(c)	Award one mark for each of the following linked points, up to a max of two marks. Put data into context (1) to provide a meaning (1) Accept any other appropriate response.	(2)

Question Number	Answer	Mark
2	Award one mark for each of the following linked points, up to a max of three marks. • Use sound files (1) to provide a description of images/text (1) to allow visually impaired users to access the system (1) • Use alternative text (1) instead of audible instructions (1) to allow hearing impaired users to access the system (1) • Use alternative input devices (1) such as voice control/blink recognition (1) to allow hands free operation (1) • Adjustable display settings (1) to allow for zooming/contrast changes/colour scheme changes (1) to allow people to comfortably read text (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
3(a)	Award one mark for each of the following linked points, up to a max of three marks. Analyse the best-selling items (1) to prioritise what to stock (1) to maximise sales (1) Find the quietest period (1) to divert staff away from tills (1) to more pressing tasks (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
3(b)	Award one mark for identification of a reason one mark for an appropriate linked explanation of the reason and one mark for a further expansion of the explanation, up to a maximum of three marks. To be more reactive to customer needs (1) thus allow them to retain customers (1) and maintain sales (1) To allow customers to order remotely (1) allowing food to be precooked (1) making queues shorter (1) To reduce staffing (1) as there is no need to take order from customer (1) meaning that more staff can be used to cook items/reduce costs (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
4	Award one mark for identification of a reason one mark for an appropriate linked explanation of the method and one mark for a further expansion of the explanation, up to a maximum of three marks. A character only stores a single character (1) and all fuel types have been encoded (1) to save space (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
5	Award one mark for identification of a reason, one mark for an appropriate linked explanation of the reason and one mark for a further expansion of the explanation, up to a maximum of three marks. To prevent competitors from gaining access (1) preventing them from poaching staff (1) by offering higher salaries (1) To prevent confidential details from being accessed (1) which could make staff dissatisfied (1) leading to lawsuits (1) To prevent other staff from knowing colleagues' salary (1) leading to demands for salary increases (1) which would drive the wage bill up (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
6(a)	Award one mark for identification of a reason and one mark for an appropriate linked explanation, up to a maximum of four marks. Provide functionality (1) to allow user to do all required tasks (1) Reduce pain points (1) by removing unneeded obstacles (1) Provide compatibility (1) with other systems (1) Improve availability (1) by reducing unneeded downtime (1) Provide a good user experience (1) by having a suitable interface (1) Accept any other appropriate response.	**(4)**

Question Number	Answer	Mark
6(b)	Award one mark for each of the following linked points, up to a max of three marks. Infect a number of computers with malware (1) that will send requests to a target IP (1) in order to overwhelm the target/cause the target to crash (1) Accept any other appropriate response.	**(3)**

Question Number	Answer	Mark
7	Award one mark for identification of a reason, one mark for an appropriate linked explanation of the reason and one mark for a further expansion of the explanation, up to a maximum of three marks. To improve security (1) as permissions to access files (1) can be allocated to specific user To improve security (1) by only allowing authorised access (1) through the use of privileges/access rights/rules (1) Accept any other appropriate response.	**(3)**

Question Number	Indicative content:	Mark
8	Learners might refer to some/all of the following in their responses, but learners should be rewarded for other pertinent contextualised answers: The evaluation may include: <u>Verification</u> • Verification techniques are used to ensure that the data has been transcribed correctly from one medium/location to another, • Verification techniques include double entry to compare both versions and proof reading • Verification tends to be very time consuming therefore some systems only verify a sample of the data. <u>Validation</u> • This technique is used to ensure that the data input is sensible/within context. • It is an automated process and can be done quickly on all of the data set • Possible techniques include range checks, restricted lists and presence checks • Validation does not check the data is correct merely acceptable <u>Reliability</u> • By using suitable techniques, the reliability of data can be improved. • Reliability refers to the accuracy and completeness of the data being used. • This is becoming more and more important in the era of AI and Big data. • Having unreliable data sets will result in unreliable/inaccurate answers. <u>Redundancy</u> • Data redundancy must be minimised • Keeping two copies of the data in different places can cause data assurance problems as one set of data could be updates whilst the other could not be.	

	• This can cause assurance problems as the operator/system could not be confident that the most recent data is being used. <u>Possible conclusion</u> • Importance of data to modern organisational demands • Unreliable data leads to unreliable results • Techniques exist to assure the quality of data • Some of these tools can be time consuming so a trade-off might be needed between completeness of checks and time • Using data assurance techniques can lead to organisations being able to have confidence in their decision making	**(9)**

Level	Mark	Descriptor
	0	No rewardable material
Level 1	**1-3**	• Demonstrates a basic analysis of the situation by superficially breaking down the different aspects into component parts (AO3a) • Demonstrates basic application of knowledge and understanding that is partially relevant to the context of the question (AO2) • Demonstrates a basic evaluation which partially considers different factors/events and competing points, leading to a conclusion which is superficial or unsupported (AO3b)
Level 2	**4-6**	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3a) • Demonstrates good application of knowledge and understanding that is relevant to the context of the question (AO2) • Demonstrates a good evaluation which considers different factors/events and competing points, leading to a conclusion which is partially supported (AO3b)
Level 3	**7-9**	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3a) • Demonstrates comprehensive application of knowledge and understanding that is consistently relevant to the context of the question (AO2) • Demonstrates a thorough evaluation which comprehensively considers different factors/events and competing points, leading to a conclusion which is well supported (AO3b)

Section B

Question Number	Answer	Mark
9(a)	Award one mark for each of the following linked points up to a maximum of four marks. Encrypting data (1) to make data meaningless (1) Use a VPN (1) to hide the IP address of machines (1) Use firewalls/anti-virus software (1) to block unauthorised access (1) Enforce strong password rules/MFA (1) to prevent brute force attacks (1) Use file access controls (1) to control who can access data files (1) Update software (1) to protect against newly identified vulnerabilities (1) Use physical controls (1) to restrict access to network devices (1) Accept any other appropriate response.	**(4)**

Question Number	Answer	Mark
9(b)	Award one mark for identification of a reason and one mark for an appropriate linked explanation, up to a maximum of four marks. Phishing (1) through communication (email/SMS etc) that looks as if it is from a trusted source/implores the target to do something urgent/asks for sensitive details (1) Pharming (1) through redirecting traffic to fake sites/DNS poisoning (1) Watering hole attacks (1) by compromising a particular website (1) USB baiting (1) by distributing malware infected USB sticks (1) Accept any other appropriate response.	**(4)**

Question Number	Indicative content:	Mark
9(c)	Learners might refer to some/all of the following in their responses, but learners should be rewarded for other pertinent contextualised answers: Discussion may include: <u>General description</u> Antivirus (AV) software runs as a background process, mostly without user intervention, scanning threat vectors for possible threats. It does this by looking for patterns based on known virus signatures. <u>Preventing Infections</u> AV software maintains a dictionary of known virus signatures. All files being accessed by a machine will be scanned. If a match is found, then the AV will prevent the file from being written to disk. It can do this by either deleting the file or placing the file in quarantine. This allows known viruses <u>Reacting to Infections</u> Some viruses could evade the prevention phase and be written to the machine. In this case the AV software can detect suspicious behaviour and can take appropriate steps to prevent damage	**(6)**

Level	Mark	Descriptor
	0	**No rewardable material**
Level 1	**1-2**	• Demonstrates a basic analysis of the situation by superficially breaking down the different aspects into component parts (AO3a) • Demonstrates basic application of knowledge and understanding that is partially relevant to the context of the question (AO2)
Level 2	**3-4**	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3a) • Demonstrates good application of knowledge and understanding that is relevant to the context of the question (AO2)
Level 3	**5-6**	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3a) • Demonstrates comprehensive application of knowledge and understanding that is consistently relevant to the context of the question (AO2)

Question Number	Answer	Mark
10(a)	Award one mark for each identification of an impact and one mark for each appropriate linked explanation, up to a maximum of four marks. The amount of money available (1) to buy/maintain the required hardware (1) The timeframe is long enough (1) to allow for the new system to be installed (1) The skills of the workforce (1) are sufficient to use the new system properly (1) Accept any other appropriate response.	**(4)**

Question Number	Answer	Mark
10(b)	Award one mark for each identification of an impact and one mark for each appropriate linked explanation, up to a maximum of four marks. Not enough space (1) to accommodate both the old and new systems (1) Not enough manpower (1) to run two systems simultaneously (1) Not enough production demand (1) to run both systems at an efficient level (1) Not enough budget (1) to operate two systems (1) Can gain immediate benefit from the new system (1) reducing payback period (1) Easier to manage (1) therefore reducing operating costs (1) Takes less time to implement (1) as changeover period is less (1) Accept any other appropriate response.	**(4)**

Question Number	Answer	Mark
10(c)	Award one mark for each of the following linked points up to a maximum of two marks. • Measure production costs/financial figures (1) to see if there is a decrease • Measure the number of cars produced per week (1) to see if this has increased (1) Accept any other appropriate response. Note Do not accept sales	**(2)**

Question Number	Indicative content:	Mark
10(d)	Learners might refer to some/all of the following in their responses, but learners should be rewarded for other pertinent contextualised answers: Indicative Content <u>Benefits of technical change</u> • Productivity levels could improve resulting in less unit cost per car • This could be achieved through updating processes • Leading to lowers ongoing costs • It might allow the company to move to a 24/7 production cycle • Also, a better quality product could be provided <u>Drawbacks of technical change</u> • High initial outlay would be required to purchase new equipment • Production time would be lost when the new equipment us being installed • Staff would need to be trained in the use and maintenance of the new equipment • Job losses could occur <u>Possible evaluation</u> There are many benefits to proceeding with this new system, primarily in reducing ongoing costs. However, there are concerns to do with initial costs and disruption. On balance it would be too advantageous to proceed with this change.	**(9)**

Level	Mark	Descriptor
	0	No rewardable material
Level 1	**1-3**	• Demonstrates a basic analysis of the situation by superficially breaking down the different aspects into component parts (AO3a) • Demonstrates basic application of knowledge and understanding that is partially relevant to the context of the question (AO2) • Demonstrates a basic evaluation which partially considers different factors/events and competing points, leading to a conclusion which is superficial or unsupported (AO3b)
Level 2	**4-6**	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3a) • Demonstrates good application of knowledge and understanding that is relevant to the context of the question (AO2) • Demonstrates a good evaluation which considers different factors/events and competing points, leading to a conclusion which is partially supported (AO3b)
Level 3	**7-9**	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3a) • Demonstrates comprehensive application of knowledge and understanding that is consistently relevant to the context of the question (AO2) • Demonstrates a thorough evaluation which comprehensively considers different factors/events and competing points, leading to a conclusion which is well supported (AO3b)

Question Number	Answer	Mark
11(a)	Award one mark for identification of a device and one mark for an appropriate linked explanation, up to a maximum of four marks. Input Keyboard (1) to enter call details into system (1) Mouse (1) to select options from a menu (1) Microphone (1) to talk to people (1) Accept any other appropriate response. Note Do not accept telephone as an input device	**(4)**

Question Number	Answer	Mark
11(b)	Award one mark for identification of a reason and one mark for an appropriate linked explanation, up to a maximum of two marks. To provide the most up to date data (1) to allow for the most suitable response to the call/to allow the nearest ambulance to be dispatched (1) To provide an instant response (1) to prevent delays in responding to calls (1) Accept any other appropriate response.	**(2)**

Question Number	Answer	Mark
11(c)	Award one mark for each identification of a factor and one mark for each appropriate linked explanation, up to a maximum of four marks. Low bandwidth (1) result in data taking longer to be transferred (to the ambulance) (1) High latency (1) would result in requests taking longer to be responded to (1) Signal strength/interference (1) resulting in slow response time (1) High signal load (1) causing a delay in available wireless capacity (1) Accept any other appropriate response.	**(2)**

Question Number	Answer	Mark
11(d)	Award one mark for each identification and one mark for an appropriate linked explanation up to a maximum of four marks. As nodes will need to transmit data (1) over a large distance (1) Accept any other appropriate response.	**(2)**

Question Number	Answer	Mark
11(e)	Award one mark for each of the following linked points, up to a max of three marks. To allocate a (new) IP address (1) to the ambulance computer (1) at is moves from one mast to another (1) Accept any other appropriate wording	**(3)**

Question Number	Indicative content:	Mark
11(f)	Learners might refer to some/all of the following in their responses, but learners should be rewarded for other pertinent contextualised answers: The evaluation may include: Hot Site This is an exact copy of the live data centre with all hardware and software mirrored. All updates to data in the live data centre must be mirrored to the Hot site in real time. This means that the ongoing costs (power and maintenance) will be very similar to the costs for the live site. Having a hot site would mean that XXXX could switch to using this facility almost immediately and this would improve resilience. Cold Site This is a facility which is basic. It has space, with the required power and data connections, but little else. This means that the ongoing costs of a cold site is low compared to the costs of the live data centre. If the cold site needs to be used then it would need to be setup. This would mean that hardware would need to be installed and setup. Data would need to be recovered from backup sources. This means that the cold site would not be available instantly and this would result in a loss of service. *A conclusion can be supported within the body of the responses or as a separate identified conclusion.* Possible conclusion As XXX provides a service that life critical functions then it would be far better to use a hot site as this would provide a far more resilient system than a cold site.	**(12)**

Level	Mark	Descriptor
	0	No rewardable material
Level 1	**1-4**	• Demonstrates a basic analysis of the situation by superficially breaking down the different aspects into component parts (AO3a) • Demonstrates basic application of knowledge and understanding that is partially relevant to the context of the question (AO2) • Demonstrates a basic evaluation which partially considers different factors/events and competing points, leading to a conclusion which is superficial or unsupported (AO3b)
Level 2	**5-8**	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3a) • Demonstrates good application of knowledge and understanding that is relevant to the context of the question (AO2) • Demonstrates a good evaluation which considers different factors/events and competing points, leading to a conclusion which is partially supported (AO3b)
Level 3	**9-12**	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3a) • Demonstrates comprehensive application of knowledge and understanding that is consistently relevant to the context of the question (AO2) • Demonstrates a thorough evaluation which comprehensively considers different factors/events and competing points, leading to a conclusion which is well supported (AO3b)

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