T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Digital Production, Design and Development

Mark Scheme (Results)

Summer 2022

Paper 2: The Business Environement

Pearson

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.

Question Number	Answer	Mark
1(a)	**Award one mark for each correctly identified method up to a maximum of 2 marks** ○ better engagement with stakeholders ○ allows provision of services/products ○ adds **measurable** value (e.g. reducing overheads, increased profits, increased sales, improving efficiency, facilitating growth, recruiting talent) ○ supports processes • as a marketing tool **Additional Guidance** Accept specific examples of ways that value can be added e.g. 'Allow workers to work remotely' - supports processes	**(2)**

Question Number	Answer	Mark
1(b)	**Award one mark for each correctly identified threat up to a maximum of 3 marks** • botnets • Distributed Denial-of-Service (DDoS) • hacking • malware (including ransomware/trojans/viruses) • social engineering (pharming, phishing) • insecure Application Programming Interfaces (APIs) • use of ad-hoc or open networks • eavesdropping/man-in-the-middle attacks. **Accept any other appropriate responses.**	**(3)**

Question Number	Answer	Mark
2	**Award one mark for identification of a reason and one mark for an appropriate linked explanation, up to a maximum of four marks.** Easy to set up / Would only need 5 cables (1) as all devices connect to **central** node (1) Highly fault tolerant (1) as failure of any PC would not affect other PCs (1) No collision occur (1) as each node does not share its cable with other nodes (1) **Accept any other appropriate responses.**	**(4)**

Question Number	Answer	Mark
3(a)	**Award one mark for each identification and one mark for an appropriate linked explanation up to a maximum of two marks.** Seat sales would not be updated in real time (1) so double booking could occur (1) **Accept any other appropriate responses.**	**(2)**

Question Number	Answer	Mark
3(b)	**Award one mark for each identification and one mark for an appropriate linked explanation up to a maximum of two marks.** Real time (1) to allow for card verification to occur immediately (1) Mobile OS (1) as the card reader could be a portable device (1) **Additional Guidance** Do not accept brand names	**(2)**

Question Number	Answer	Mark
3(c)	**Award one mark for each of the following linked points, up to a max of two marks.** Payment details could be stolen (1) which could result in a potential financial loss to customers (1) Customers will be unable to book tickets (1) as the server may be offline (1) Loss of personal data (1) leading to targeted cyber attacks (1) **Accept any other appropriate responses.**	**(2)**

Question Number	Answer	Mark
4	***Award one mark for each of the following linked points, up to a max of four marks.*** User age (1) as all users will be at least 16 years old (1) User skill level (1) as the system will be used by a broad range of people/will only be used occasionally (1) Education level (1) as the system needs to be used by all members of the public (1) Additional needs (1) as a public system must meet legal requirements / make the system accessible to all (1) **Accept any other appropriate responses.** **Additional guidance** Expansion must be linked to the scenario	**(4)**

Question Number	Answer	Mark
5	**Award one mark for identification of a feature and one mark for an appropriate linked explanation, up to a maximum of four marks.** Periodically scans storage devices (1) to identify potential malicious files (1) Scans all files after downloads (1) to see if the file is potentially damaging (1) Scans in real time (1) to identify threats (1) Maintain its virus dictionary (1) to make sure that (newer) threats are recognised (1) Quarantines potential threats (1) so that the damage they might cause is minimised (1) Removes identified threats (1) to prevent damage to other files (1) **Accept any other appropriate responses.**	**(4)**

Question Number	Answer	Mark
6(a)	**Award one mark for each identification, one mark for an appropriate linked explanation and one mark for a further linked expansion of the explanation up to a maximum of three marks.** **Technological** New technologies would be scoped (1) to identify new opportunities (1) and threats (1) Proposed technologies used would be evaluated (1) by comparing costs (1) and benefits (1) New systems would be designed (1) and built/bought (1) and installed (1) Staff would be trained (1) in the use of new technologies (1) to ensure maximum benefit (1) **Accept any other appropriate responses.**	**(3)**

Question Number	Answer	Mark
6(b)	**Award one mark for each identification, one mark for an appropriate linked explanation and one mark for a further linked expansion of the explanation up to a maximum of three marks.** **Legal change** Policies would be revised (1) to ensure that they are all compliant with new requirements (1) to avoid risk of prosecution (1) Processes would need to be evaluated (1) to ensure that no legal issues occur (1) which could lead to prosecution (1) Training would be undertaken (1) to ensure that all staff are aware of new policies (1) so company is compliant (1) **Accept any other appropriate responses.**	**(3)**

Question Number	Answer	Mark
7	**Award one mark for each of the following linked points, up to a max of two marks.** A SAN stores data at the block level (1) but NAS accesses data as files (1) SAN typically appears as a disk (1) whereas NAS appears as a file server (1) SAN can be scaled by adding more storage controllers (1) whereas NAS is not easily scalable (1) SAN requires a dedicated network hardware to connect to a network (1) whereas NAS connects via an Ethernet cable (1) A SAN comprises many discrete hardware components/ discrete network (1) whereas a NAS is a single device (1) **Accept any other appropriate responses.**	**(2)**

Question Number	Answer	Mark
8	**Learners might refer to some/all of the following in their responses, but learners should be rewarded for other pertinent contextualised answers:** **Advantages of Thin Client** Thin clients do less processing and can thus be lower performance, cheaper machines. Clients do not need to be upgraded as often as in client-server networks. This would save ongoing costs and reduce environmental impacts. Thin client networks are more secure as no software is stored locally on clients, this would prevent users installing unauthorized software or accidently introducing malware Managing software is easier as all application programs are stored on the server only, so patching/upgrading/installing/removing software is much easier. **Disadvantages of Thin Clients** More of a processing load is placed on the server therefore more money must be spend on a powerful server that can meet the needs of all clients in a timely manner. Some specialist applications require more memory and processing power locally than most clients could handle. A fast, robust network is needed to handle increased traffic. **Application to scenario** The learner may consider these points in relation to the scenario: • System will typically be used for office/productivity tasks so powerful machines are not required • They will be dealing with sensitive data so security is important • There are only 10 users so load on the network may not be an issue **Conclusion** A thin client system would be suitable as most users would be running office applications such as databases, word processors and spreadsheets. These do not require much excessive processing so the cost of the server would not be excessive as the number of users is relatively small.	**(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 (AO3) • Demonstrates basic application of knowledge and understanding that is partially relevant to the context of the question (AO2) • Demonstrates a basic assessment which partially considers different factors/events and their relative importance, leading to a conclusion which is superficial or unsupported (AO3)
Level 2	4-6	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3) • Demonstrates good application of knowledge and understanding that is relevant to the context of the question (AO2) • Demonstrates a good assessment which considers different factors/events and their relative importance, leading to a conclusion which is partially supported (AO3)
Level 3	7-9	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3) • Demonstrates comprehensive application of knowledge and understanding that is consistently relevant to the context of the question (AO2). • Demonstrates a thorough assessment which comprehensively considers different factors/events and their relative importance, leading to a conclusion which is well supported (AO3)

Section B

Question Number	Answer	Mark
9(a)	**Award one mark for identification of a reason, one mark for an appropriate linked explanation of the benefit and one mark for a further expansion of the explanation, up to a maximum of three marks.** To reduce the threat area / limits the amount of **access points** (1) decreases the risk of unauthorised users trying to access the network (1) and therefore reducing the vulnerability of the data (1) **Accept any other appropriate response**	**(3)**

Question Number	Answer	Mark
9(b)	**Award one mark for each of the following linked points, up to a max of two marks.** Penetration Testers/White Hat hackers (1) would attempt to break into the network (1) **Accept any other appropriate responses.**	**(2)**

Question Number	Answer	Mark
9(c)	**Award one mark for each identification of a risk and one mark for an appropriate linked explanation up to a maximum of four marks.** System failure (1) would affect safe treatment of patients (1) Privacy breach (1) could result in legal action by patient (1) Failure to comply with legal obligations (1) would result in prosecution (1) **Accept any other appropriate responses.**	**(4)**

Question Number	Answer	Mark
9(d)	**Learners might refer to some/all of the following in their responses, but learners should be rewarded for other pertinent contextualised answers:** **Benefits of packet switching** Packets are routed via the shortest path so reducing bottlenecks. This means that data reaches the destination in a shorter time. Packets contain error correction data, so any corruption of data will not be critical. Packet switching networks are more robust, as fault tolerance methods are inherent in their design and construction. Packets contain an ID/packet number, meaning packet do not need to arrive in a specific order. Each packet can take the most efficient route available and be reassembled into the correct order at destination.	**(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 (AO3) • 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 (AO3) • 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 (AO3) • 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 a use and one mark for an appropriate linked explanation up to a maximum of four marks.** SSD Has faster **access** time (1) so to allow fast start-up/responsiveness (1) HDD (Staff details held on HDD) access time is not critical (1) so can be stored on a drive with slower read/write speeds (1) Database will be frequently updated (1) and SSD has a finite cell life (1) **Accept any other appropriate response.** **Additional Guidance** Do not allow answers relating to cost.	**(4)**

Question Number	Answer	Mark
10(b)	**Award one mark for each identification of a physical threat and one mark for an appropriate linked explanation up to a maximum of four marks.** • location of machine (1) as computer is in an area accessible to all warehouse staff (1) • circumstances of use (1) as warehouse staff under pressure to complete an order in time might not use system as intended (1) • characteristics of users (1) as warehouse staff will not be IT specialists (1) • system layout (1) as screen needs to be positioned to avoid shoulder surfing (1) • system robustness (1) as collisions could occur between the computer and trollies/ other equipment (1) **Accept any other appropriate responses.**	**(4)**

Question Number	Answer	Mark
10(c)	**Award one mark for identification of the 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.** If details about perks or salary were leaked then staff who were not as well rewarded (1) could demand to be better paid (1) and this would drive up staffing costs (1) If an employee's home address was leaked (1) then the employee could be worried about a disgruntled customer visiting their house (1) and risking their security/safety (1) an employee might lose confidence (1) in the company's ability to protect personal details (1) and leave / reduce productivity / become demoralised (1) **Accept any other appropriate response.**	**(3)**

Question Number	Answer	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:** **The evaluation may include:** **Initial costs of setting up system** Hardware such as hand held scanners would need to be bought and a wireless network installed in the warehouse. This would involve a monetary cost and also some disruption to the operation of the warehouse due to electrical work and staff training requirements. A (relational) database would need to be created and would need to be populated. Change in Operations/Business Practice As stock arrives in the warehouse all boxes are scanned, and this information is used to update the stock table and the stock order table. As staff pick a customer order they scan the item being ordered before placing it into the relevant container. If the number of items in stock field is updated accordingly. If the number of items left in stock is below a threshold value then an automated order for more stock can be generated. Once all items for a customer order have been picked the barcode on the container can be scanned to indicate that the order is complete and read to be delivered. The customer order table can then be updated. Advantages to the Warehouse Current stock levels would be available at all times to manager. A list of all items to be reordered could automatically be produced at the end of each day, without the need to do a manual stock check. Invoices could be calculated automatically for each order. Customers could be informed immediately of any stock shortages. Evaluation There would be a high initial capital cost to install and commission the system, but the system would offer the company many advantages such as real time management information and would help maintain customer satisfaction. Therefore it would be worthwhile installing the system.	**(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 (AO3) • Demonstrates basic application of knowledge and understanding that is partially relevant to the context of the question (AO2) • Demonstrates a basic assessment which partially considers different factors/events and their relative importance, leading to a conclusion which is superficial or unsupported (AO3)
Level 2	4-6	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3) • Demonstrates good application of knowledge and understanding that is relevant to the context of the question (AO2) • Demonstrates a good assessment which considers different factors/events and their relative importance, leading to a conclusion which is partially supported (AO3)
Level 3	7-9	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3) • Demonstrates comprehensive application of knowledge and understanding that is consistently relevant to the context of the question (AO2). • Demonstrates a thorough assessment which comprehensively considers different factors/events and their relative importance, leading to a conclusion which is well supported (AO3)

Question Number	Answer	Mark
11(a)	**Award one mark for each of the following linked points, up to a max of four marks.** • **Validation** techniques (1) are used to ensure data is sensible (1) • **Verification** techniques (1) are used to find errors in data input (1) **Additional guidance** Allow examples of validation/verification.	**(4)**

Question Number	Answer	Mark
11(b)	**Award one mark for each of the following linked points, up to a max of three marks.** • The package would send a request (to the data server) (1) • The server would check the **key** of the request (1) • The server would process the request (1) • The server would send the results of the request back (1) • Establishes the connection between app and server (1) • Provides the standards by which they communicate (1) • Ensures secure connection between the two platforms (1) **Accept any other appropriate responses.**	**(3)**

Question Number	Answer	Mark
11(c)	**Award one mark for each of the following linked points, up to a max of three marks.** Asking staff who are being made redundant/sacked (1) to leave immediately (1) therefore preventing them from intentionally damaging data (1) Monitor employee activity (1) to look for unusual activity (1) such as accessing network at unusual time (1) Enforce strict file permissions/use encryption (1) to restrict access to files (1) to only people who need access to the data (1) **Accept any other appropriate response.**	**(3)**

Question Number	Answer	Mark
11(d)	**Award one mark for each of the following linked points, up to a max of three marks.** • customer homes could be mapped (1) • to see their distance from existing bus stops (1) • to help plan new stops (1) **Accept any other appropriate response.**	**(3)**

Question Number	Answer	Mark
11(e)	**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:** **File Based Systems** **Advantages** No extra storage space needed for directory, so storage overheads are lower. Easy to add records as they can be appended to the end of the file or inserted in their correct location in file. Collisions cannot occur. Allows for sequential processing of all records. **Disadvantages** Access to records is sequential so on average the access time will be longer. **Directory Based Systems** **Advantages** Faster access times as records/buckets can be accessed in a direct manner using the file directory(index). Directories can be layered to speed up access times further. **Disadvantages** Storage overheads are larger as the directory must be stored. Collisions will occur as the number of records increase, resulting in more use made of overflow areas and slower access times. Directories will have to be redesigned if the access times become too long, and the structure will need to be rebuilt. Does not allow for easy sequential processing **Conclusion** Is speed of access is important the number of records is unlikely to increase dramatically in the future then a directory based structure would be more apt as this would allow for faster access speeds.	**(12)**

The 2nd trait (AO2) carries twice as much weighting as traits 1 & 3.

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 (AO3) • 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 (AO3)
Level 2	5-8	• Demonstrates a good analysis of the situation by breaking down the different aspects into component parts (AO3) • 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 (AO3)
Level 3	9-12	• Demonstrates a thorough analysis of the situation by comprehensively breaking down the different aspects into their component parts (AO3) • 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 (AO3)