T Level Technical Qualification in Digital Support Services

Occupational specialism assessment (OSA)

Network Cabling

Assignment 3

Mark scheme

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Marking guidelines

General guidelines

You must apply the following marking guidelines to all marking undertaken throughout the marking period. This is to ensure fairness to all students, who must receive the same treatment. You must mark the first student in exactly the same way as you mark the last.

- the mark scheme must be referred to throughout the marking period and applied consistently, do not change your approach to marking once you have been standardised
- reward students positively giving credit for what they have shown, rather than what they might have omitted
- utilise the whole mark range and always award full marks when the response merits them
- be prepared to award 0 marks if the student's response has no creditworthy material
- do not credit irrelevant material that does not answer the question, no matter how impressive the response might be
- the marks awarded for each response should be clearly and legibly recorded
- if you are in any doubt about the application of the mark scheme, you must consult with your team leader or the chief examiner

Guidelines for using extended response marking grids

Extended response marking grids have been designed to award a student's response holistically for the relevant task or question and should follow a best-fit approach. The grids are broken down into levels, with each level having an associated descriptor indicating the performance at that level. You should determine the level before determining the mark.

Depending on the amount of evidence that the task produces, the grids will either be a single, holistic grid that covers the range of relevant performance outcomes (POs), and will require you to make a judgement across all the evidence, or they will consist of multiple grids, that will be targeted at specific POs, and will require you to make a judgement across all the evidence in relation to that particular grid in each case, therefore making multiple judgements for a single task to arrive at a final set of marks. Where there are multiple grids for a particular task, it is important that you consider all the evidence against each of the grids, as although the grids will focus on particular POs, awardable evidence for each grid may come from across the range of evidence the student has produced for the task.

When determining a level, you should look at the overall quality of the response and reward students positively, rather than focussing on small omissions. If the response covers aspects at different levels, you should use a best-fit approach at this stage and use the available marks within the level to credit the response appropriately.

When determining a mark, your decision should be based on the quality of the response in relation to the descriptors. Standardisation materials, marked by the chief examiner, will help you with determining a mark. You will be able to use exemplar student responses to compare to live responses, to decide if it is the same, better or worse.

To support your judgement, the indicative content is structured in such a way that mirrors the order of the different points within the band descriptors. This will allow you to use the 2 in conjunction with each other by providing examples of the types of things to look for in the response, for each descriptor. In other words, the indicative content provides you with a starting point of possible examples and the bands express the range of options available to you in terms of the quality of the response. You should apply the standards that have been set at relevant standardisation event in a consistent manner.

You are reminded that the indicative content provided under the marking grid is there as a guide, and therefore you must credit any other suitable responses a student may produce. It is not a requirement either that students must cover all of the indicative content to be awarded full marks.

Performance outcomes

This assessment requires students to:

PO1: Apply procedures and controls to maintain the digital security of an organisation and its data

PO2: Install and test cabling in line with technical and security requirements

PO3: Discover, evaluate and apply reliable sources of knowledge

Task 1: troubleshooting faulty cables

PO1/PO2

Fault	Steps taken by student	Marks
Cable 1: one RJ45 configured as cross-over cable	Student correctly configures wires for straight through cable	1
	Student fits RJ45 the correct way up	1
	Student correctly crimps RJ45 with outer covering gripped by crimp	1
	Student tests cable and confirms correct functioning as a straight through cable	1
Cable 2: short across wires inside one RJ45	Student removes RJ45 and cuts out damaged wires	1
	Student correctly configures wires for straight through cable	1
	Student correctly crimps RJ45 with outer covering gripped by crimp	1
	Student tests cable and confirms correct functioning as a straight through cable	1
Cable 3: outer sheath of cable not gripped by crimp within one RJ45	Student removes RJ45 and cuts wires to the correct length to ensure a correct fit	1
	Student correctly configures wires for straight through cable	1
	Student correctly crimps RJ45 with outer covering gripped by crimp	1
	Student tests cable and confirms correct functioning as a straight through cable	1
Cable 4: one RJ45 has been wired ‘upside down’ but has not been crimped	Student removes RJ45 and fits it the correct way around	1
	Student correctly crimps RJ45 with outer covering gripped by crimp	1
	Student tests cable and confirms correct functioning as a straight through cable	1

Fault	Steps taken by student	Marks
Cable 5: wires within one end of the cable do not reach the copper pins within the RJ45	Student removes RJ45 and cuts wires to the correct length to ensure a correct fit	1
	Student checks to ensure all wires are in the correct order and reach to the copper pins	1
	Student correctly crimps RJ45 with outer covering gripped by crimp	1
	Student tests cable and confirms correct functioning as a straight through cable	1
	Completion of test plan:	
	Test plan is completed consistently accurately, and with relevant and logical remarks	5–6
	Test plan is completed, although there may be some less important issues missed. Remarks are mixed, with some relevant but not all	3–4
	There is limited information in the test plan. It may not be accurate, and it may miss important elements	1–2
	No creditworthy material	0

Task 2: troubleshooting the cabling installation

PO2

Band	Marks	Descriptor
4	13–16	Comprehensive testing of the Cisco Packet Tracer network and exceptional ability to troubleshoot and fix any issues encountered. All issues have been identified and resolved.
3	9–12	Proficient testing of the Cisco Packet Tracer network and effective ability to troubleshoot and fix any issues encountered. All issues have been identified and the majority of these have been resolved.
2	5–8	Some testing of the Cisco Packet Tracer network, which may be seen as sufficient at the top of the band but may not be adequate at the bottom of the band. Some ability to troubleshoot and fix any issues encountered, but may have only resolved some issues.
1	1–4	Limited testing of the Cisco Packet Tracer network . Limited ability to troubleshoot and fix any issues encountered.
	0	No creditworthy material.

Indicative content

The student has carried out cable testing, applying appropriate testing processes.

Cisco Packet Tracer testing is used to troubleshoot and address issues. The test plan should contain evidence of multiple component tests in the following area:

- port status turned on for appropriate components
- appropriate cable connectivity
- appropriate IP addressing ensuring network connectivity (static to DHCP)

The student may utilise PDUs/packets and network inspection to achieve the above.

The number of issues addressed will indicate the level and detail of troubleshooting implemented, and should be considered in relation to the band descriptors.

The test plan and screenshots will show the issues that students have addressed, from the following list of issues that are relevant to the task:

- Newcastle PC-02 - port status is off
- London switch Fa0/1 - port status is off
- Newcastle router to switch cable is in G0/2 - needs to be in the configured G0/1 port
- London PC-01 - incorrectly configured for static IP - needs set to DHCP

Note: the above is not an exhaustive list; credit should be given to other suggestions as appropriate to the scenario of the brief.

PO3

Band	Marks	Descriptor
4	4	The test plan and written description of analysis show exceptional, and at the top of the band very comprehensive, critical thinking regarding the choices and decisions during the testing process.
3	3	The test plan and written description of analysis show a good amount of effective critical thinking regarding the choices and decisions during the testing process, covering most of the key elements.
2	2	The test plan and written description of analysis show some critical thinking regarding the choices and decisions during the testing process but may miss some key elements.
1	1	The test plan and written description of analysis show limited or very limited critical thinking regarding the choices and decisions during the testing process.
	0	No creditworthy material.

Indicative content

Critical thinking can be demonstrated through the test plan and written description of analysis, which would consider the process of critical thinking and the application of evaluation techniques and tools.

The quality of the student's test plan will be in line with their ability to identify faults in this task.

The quality of the student's written description of analysis will be in line with their ability to resolve faults in this task.

Note: the above is not an exhaustive list; credit should be given to other suggestions as appropriate to the scenario in the brief.

Task 3: carry out a risk assessment of the client's network

PO1

Band	Mark	Descriptor
4	10–12	The student identifies a comprehensive range of risks related to the scenario, which must include examples of physical, technical and administrative risks. The student makes excellent recommendations for security controls and comprehensively identifies the physical, technical and administrative controls as part of their risk assessment.
3	7–9	The student identifies a good range of risks, but may not include all, and may miss some less important risks. The student makes good recommendations for security controls and identifies a wide range of physical, technical and administrative controls as part of their risk assessment.
2	4–6	The student identifies some risks, which includes some key ones, but may also miss some key risks. The student makes sound recommendations for security controls and identifies some physical, technical and administrative controls as part of their risk assessment.
1	1–3	The student identifies a limited number of risks and has missed most of the key risks. The student makes a few basic recommendations for security controls and identifies a limited number of physical, technical and administrative controls as part of their risk assessment.
	0	No creditworthy material.

Indicative content

Risk assessment template has been completed including physical, technical and administrative risks.

All columns contain appropriate explanations. Impact and likelihood contain low/medium/high/critical qualitative rating.

Actions are identified with detailed explanations of how the actions taken will mitigate risks.

Controls should be identified as technical, physical or administrative.

Actions should be detailed as preventative, detective, corrective, deterrent, directive, compensating or acceptance.

The student should identify a range of risks to the network based on the scenario; these may include:

- single point of failure could result in loss of connectivity between sites
- only London has a back-up mobile data (4G) connection
- losing the London server due to failure or VPN loss would result in network connectivity issues and login issues

- losing the Newcastle server would result in the loss of the file and printing server for both sites - only one of these services is considered business critical
- low risk to hardware with inert gas but high risk to life - all other areas could be destroyed by fire but there are limited options to circumvent this
- the scenario implies that there is no managed access to the server room and no real building control for closing the building which could result in accidentally leaving the buildings open – loss of keys is a significant risk
- single point of failure to the server due to only one implemented network card

Physical controls could be implemented in appropriate areas based on the scenario given. Examples could include:

- poor access control, such as key fobs
- Kensington locks
- security alarms
- security guards on sites
- secure server room in each location
- CCTV
- external fence or gate on each site
- ID cards

Technical controls could include:

- installation of antivirus or malware software
- WiFi encryption
- patch management
- additional unused network cards could provide redundancy

Administrative controls could include:

- sign in/sign out procedures
- acceptable use policy
- password policy

Note: the above is not an exhaustive list; credit should be given to other suggestions as appropriate to the scenario in the brief.

Example risk assessment with some entries completed:

Threat	Vulnerability	Asset	Impact	Likelihood	Risk	Action	Control type
Rodents and wildlife damaging cables	Unprotected and exposed external cabling	Physical cables and data being transmitted	Medium. Loss of service to customer. Potential reputational damage for organisation. Additional cost for replacement of cables	Medium. Although the majority of cable is protected, some sections are exposed	Cables are damaged by wildlife, leading to loss of service for client and damage to reputation for providing organisation	Ensure physical trunking protects cables in their entirety. Implement methods to deter wildlife where needed	Physical Preventative
Flooding	Ground floor equipment	Physical assets with potential impact on digital assets	High. Damage to physical assets resulting in loss of digital data. This may result in downtime and have a financial impact	Low The area is noted to not have any flooding and no mention of water mains within the building being near important areas	Equipment being water damaged leading to loss of service	As there is almost no risk there are no applicable actions	Acceptance
Loss of service - Active Directory	Server/Service	Digital Services	Medium. Logging into device will be impacted where not using cached accounts	Medium As only one server offers this service for both networks this is a single point of failure	Loss of business-critical service resulting in a loss of productivity and potential financial impact	Configure the alternative server to also act as a domain controller so as to avoid a single point of failure	Preventative

Security breach between sites	The site-to-site connection	Data communication between sites	High. Confidential data loss potentially resulting in GDPR issues	Low due to the site-to-site connection utilising a VPN connection to secure traffic between the two sites	The site-to-site link is breached by a third party without authorisation	To ensure the connection is not breached regular monitoring of logs and scheduled changes to the pre-shared key used to secure the VPN	Preventative Detective

PO3

Band	Mark	Descriptor
4	4	The recommendations provided demonstrate an excellent level of critical thinking in the generation of the security risk assessment and highly effective understanding of why the risk level is justified, with excellent explanation as to how the controls reduce the risk.
3	3	The recommendations provided demonstrate a good level of critical thinking in the generation of the security risk assessment and mostly effective understanding of why the risk level is justified, with good explanation as to how the controls reduce the risk.
2	2	The recommendations provided demonstrate a reasonable level of critical thinking in the generation of the security risk assessment and some understanding of why the risk level is justified, with reasonable explanation as to how the controls reduce the risk.
1	1	Any recommendations provided demonstrate a minimal level of critical thinking in the generation of the security risk assessment and basic understanding of why the risk level is justified, with limited explanation as to how the controls reduce the risk.
	0	No creditworthy material.

For each risk the student identifies they should be fully completing the risk assessment template provided.

For example, the student could identify the following in relation to the risk of no managed access to the server room and no real building control for closing the building:

- identification of threat:
  - careless employees
- vulnerability related to threat:
  - loss of keys
- asset at risk:
  - server and all containing data, services provided by the server - all assets, all infrastructure assets.
- impact if threat is exploited:

  - GDPR breach depending on data lost
  - down time, possible breach of SLA
  - financial loss, from theft and replacement of locks and keys
- likelihood that threat is exploited:
  - medium
- overall risk to business:
  - high
- recommended action:
  - implement key management (separate keys for separate locks)
- type of control
  - physical

For other identified risks, a similar level of critical thinking should be applied to give a similar level of detail.

Note: the above is not an exhaustive list; credit should be given to other suggestions as appropriate to the scenario in the brief.

Performance outcome grid

Task	PO1	PO2	PO3	Total
1	4	21		25
2		16	4	20
3	12		4	16
Total marks	16	37	8	61
% Weighting	26%	61%	13%	100%

Document information

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Change History Record

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