

1.3.3

NETWORKS

TOPIC WISE EXAM QUESTIONS

ANSWERS

A-LEVEL

OCR

1	(d)	(i)	<p>e.g.</p> <ul style="list-style-type: none"> • Share hardware (e.g. printers) • Share files • Share Internet connection • Centralised security • Log on / access files from any machine on the LAN • Central maintenance • Central backup / storage • Central installation / update of programs • Can monitor user activity • Can control access levels // Centralised user admin • Access an intranet 	3	Mark first answer in each answer space
1	(d)	(ii)	<ul style="list-style-type: none"> • A set of rules // an agreement • Used to ensure the (proper / successful) transfer of data between devices // used to govern the transmission/communication between devices • May specify format of data / error checking / etc 	2	<p>Allow suitable example of contents of a protocol for MP3</p> <p>Do not award a rule - must be plural</p>
1	(d)	(iii)	<p>1 mark per protocol listed</p> <p>e.g.</p> <ul style="list-style-type: none"> • HTTP // Hypertext Transfer Protocol • HTTPS // Hypertext Transfer Protocol Secure • TCP // Transmission Control Protocol • IP // Internet Protocol • UDP // User Datagram Protocol • FTP // File Transfer Protocol • Ethernet • WPA // Wi-Fi Protected Access • DHCP // Dynamic Host Configuration Protocol • SMTP // Simple Mail Transfer Protocol • POP // Post Office Protocol • IMAP // Internet Message Access Protocol • RDP // Remote Desktop Protocol • VoIP // Voice over Internet Protocol 	2	<p>Mark first answer in each answer space</p> <p>If mentioned one protocol with 2 versions e.g. IPv4 & IPv6 - only 1 mark</p> <p>If they've written the protocol in full but got any word wrong, no mark awarded</p>
1	(d)	(iv)	<ul style="list-style-type: none"> • To apply protocols in order / one after the other • To provide independence of layers // Layers can be modified without affecting other layers // Layers are self-contained • Hides details from previous or next layer(s) // is an abstraction • Each layer is well defined / does a specific job • Breaks tasks down into manageable units // Groups similar protocols together • Improved troubleshooting (easier identification of the layer that causes the issue) • Each layer only communicates with adjacent layers // simplifies interfacing • Hardware/software can be manufactured to fit into one specific layer • Allows for standards for individual tasks/layers to be developed // for compatibility 	3	

6	(a)	(i)	<ul style="list-style-type: none"> In circuit switching dedicated hardware resources are used for each connection In packet switching hardware is used for multiple different connections. In circuit switching the data is sent along one route/stream. In packet switching packets of data may be sent along multiple different routes/packets may not be in order 	AO1.2 (2)	Marks answers in pairs
6	(a)	(ii)	<ul style="list-style-type: none"> Computer networks would involve multiple connections happening concurrently In packet switching hardware is not tied up with each unique connection // can handle multiple connections simultaneously Computers pass vast amounts of data which may encounter transmission errors Packet switching means only resending individual packets instead of the whole data stream Computers may be transmitting business critical data Packet switching means any network hardware failures can be mitigated by routing around it. 	AO2.1 (2)	
6	(b)		<p>Mark Band 3–High Level (7-9 marks) The candidate demonstrates a thorough knowledge and understanding of both peer to peer and client server and can give valid application of both in this scenario. All detail are generally accurate and relevant The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation.</p> <p><i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Mark Band 2-Mid Level (4-6 marks)</p>	AO1.1 (2) AO1.2 (2) AO2.1 (2) AO3.3 (3)	<p>AO1 P2P:</p> <ul style="list-style-type: none"> Each computer can act independently Each computer is responsible for it's own security and login Each computer will maintain and possibly share its own connected hardware (printer/external storage/internet connection) Each computer will maintain and possibly share its own secondary storage If a computer is powered down it's shared resources will not be available. There are no resources not shared by a peer machine Adding a machine is simple Very little administration is needed <p>Client Server:</p>
			<p>The candidate demonstrates reasonable knowledge and understanding of client server and peer to peer; the material is generally accurate but at times underdeveloped. The candidate may not have applied both to this scenario. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation.</p> <p><i>There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.</i></p> <p>Mark Band 1-Low Level (1-3 marks) The candidate demonstrates a basic knowledge of client/server or peer to peer and has made some attempt at applying this knowledge. the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides nothing more than an unsupported assertion.</p> <p><i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p>0 marks No attempt to answer the question or response is not worthy of credit.</p>	<ul style="list-style-type: none"> All network functionality can be provided by servers. A server is a process running on a machine, usually dedicated to providing these services. A server machine is designed to never be powered down. Login/security is handled centrally Shared storage may be managed by a server Shared resources (printer/internet connection etc) may be managed by a server If a server process or machine fails, network functionality, including the ability login is lost Adding a new machine can mean installing specialist client software and setting up OS policies. IT skills and a lot of time are needed to administer a client server network <p>AO2 P2P:</p> <ul style="list-style-type: none"> As Zak is looking to expand his staff, P2P would offer flexibility in adding staff ad hoc. Zak's company is still small and may struggle to pay for the IT administrator skills needed for a client server <p>Client Server:</p> <ul style="list-style-type: none"> As Zak's firm is an accountancy firm it will have sensitive customer data Client server would allow stronger centralised security As Zak is taking on multiple staff, they may wish to work collaboratively, which shared storage would allow. Zak could share a single printer/other hardware with all staff and not worry about an individual computer being switched on. 	

(b)	(i)	<ul style="list-style-type: none"> Protocol to be used is decided based on the application E.g. HTTPS for browser based service // SMTP/IMAP for messaging service Adds encryption Passes on <u>to</u> transport layer to send Gets data <u>from</u> transport layer when receiving Unpacks message ready for display // removes headers or other non-viewable data Decrypts message 	5	For BP2, don't allow HTTP (question mentions encryption). Don't allow a list of protocols which aren't relevant to the question. Don't allow a protocol without its use
	(ii)	<ul style="list-style-type: none"> Receives (layered) data <u>from</u> internet layer to send MAC addresses are added to the packet Passes and receives data across wireless network (to WAN / other machine) Passes (layered) data back up <u>to</u> internet layer when receiving 	2	Wireless access given in question stem

AS - Level

2	(b)	<p>1 mark per bullet up to a maximum of 2 marks, e.g:</p> <ul style="list-style-type: none"> Disk Defragmentation... ...To keep optimal r/w speed for her HDD File management... ...To allow easy access to her file system Disk Drivers... ... To allow her to use new peripheral devices System Clean-up... ... to keep her system free of redundant files Anti-Virus/Malware... 	4 AO1.1 (2) AO1.2 (2)	<p>1 Mark for a suitable utility and 1 mark for a relevant example for that utility.</p> <p>Do not accept task manager</p> <p>Accept:</p> <ul style="list-style-type: none"> Compression Software to make the file size smaller Backup Software to make copies of files 				
3	(a)	<ul style="list-style-type: none"> A set of rules (for communication) 	1 AO1.1 (1)	Do not accept instructions instead of rules				
3	(b)	(i) <p>1 mark for each completed row up to a maximum of 2 marks:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>Application</td></tr> <tr><td>Transport</td></tr> <tr><td>Network</td></tr> <tr><td>Link</td></tr> </table>	Application	Transport	Network	Link	2 AO1.1 (2)	<ul style="list-style-type: none"> Accept in any order Accept Internet instead of Network
Application								
Transport								
Network								
Link								
3	(b)	(ii) <p>1 mark per bullet up to a maximum of 2 marks, e.g:</p> <ul style="list-style-type: none"> Allows different layers to be worked on independently Allows layers to be replaced/upgraded without affecting others Allows for layers from different providers to be used interchangeably 	2 AO1.2 (2)					

1	(a)	i	<ul style="list-style-type: none"> Client computers connect to server Server provides access to a resource/service In this case hotel staff use client computers to connect to database on server (or other sensible example). 	3	AO1.2
		ii	<p>e.g.</p> <ul style="list-style-type: none"> only one point of failure easier to manage users/access Easier to backup Easier to keep data secure. Technicians can more easily remotely install / monitor. 	2	AO1.1
	(b)		<ul style="list-style-type: none"> Joins computers/devices together on a LAN Receives packets/data Recipient's address is given in packet header/it uses the mac address Send packets/data Out the correct port /to the specific computer device 	3	AO1.1
	(c)		<p>Mark Band 3–High Level (7-9 marks) The candidate demonstrates a thorough knowledge and understanding of network security. The material is generally accurate and detailed.</p> <p>The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation.</p> <p>The candidate provides a thorough discussion which is well balanced. Evaluative comments are consistently relevant and well-considered.</p> <p>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</p> <p>Mark Band 2-Mid Level (4-6 marks) The candidate demonstrates reasonable knowledge and understanding of network security; the material is generally accurate but at times underdeveloped.</p> <p>The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation.</p> <p>The candidate provides a sound discussion. the</p>	9	<p>AO1 Malware and viruses are software that can have a negative impact on computer systems</p> <p>AO1.1 (2) Spyware and keyloggers can record information entered and send back to a third party</p> <p>AO1.2 (2) Phishing attacks attempt to steal data by fraudulently appearing as legitimate emails asking for secure information</p> <p>AO2.1 (2) Denial of Service Attacks can overload a computer system with traffic and effectively disable access for legitimate users</p> <p>AO3.3 (3)</p> <p>AO2 Hotel's systems could be disrupted by DDOS attacks so no external bookings able to be made. Phishing and spyware attacks may compromise visitor security and result in financial loss Malware, viruses could destroy hotel data Theft of customer data would be an issue under Data Protection Act / GDPR for which the hotel could be prosecuted</p> <p>AO3 Education for staff and customers is important to deal with recognising and dealing with threats Up to date software, limitations of use of devices such as USB sticks and restricted access to wireless networks can all limit risks. Use of Firewall to restrict traffic entering and leaving the network. Should be balanced against customer experience; will customers return if they have no access to It facilities?</p>

AS - Level

4	b	<p>1 mark per bullet up to a maximum of 4 marks</p> <ul style="list-style-type: none"> DNS is used to resolve IP corresponding to URL Request sent to DNS resolver. Resolver checks its cache and if it doesn't hold the URL, it passes it in to the TLD Name server which checks its cache and returns the answer or passes on to the.. Authoritative Name Server. The IP address is returned back up to the requesting client. Or an error if no resolution can be found. 	4	<p>AO1.1 (2)</p> <p>AO1.2 (2)</p>	<p>Award the mark for checking of cache at any of the stages but limit to one mark for this aspect.</p>
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2018

4	a		<ul style="list-style-type: none"> - Wide Area Network - Collection of connected computers/devices over a large geographical area - Often using 3rd party communications channels (1 Mark per -, max 2)	2 (AO1.1)	
	b	i	<ul style="list-style-type: none"> - Allowing them to communicate - By ensuring all devices follow the same rules/standards - So they interpret data/signals in the same way (1 Mark per -, max 2)	2 (AO1.2)	
		ii	<ul style="list-style-type: none"> -Application -Transport -Internet -Network Interface/(Data) Link/Physical (1 Mark per -, max 4)	4 (AO1.1)	

2017

c	i	Advantage: <ul style="list-style-type: none"> - Centrally administered in one location. (1) - One location to back up. (1) Disadvantage: <ul style="list-style-type: none"> - Central point of failure. (1) - Can be expensive to maintain/set up (e.g. cabling costs, specialist staff.) (1) (Max 1 Advantage, 1 Disadvantage)	2 (AO1.2)	Accept for MP1 better security Do not credit quick access as an advantage
	ii	A hardware device/piece of software that monitors (and filters/blocks) traffic/packages <u>going to and from</u> a network. (1) (Max 1)	1 (AO1.1)	Accept 'content' for 'traffic/packages'
	iii	Prevent unauthorised access to a network. (1) To restrict applications that are used internally that have internet access. (1) To restrict websites that can be accessed from within the company. (1) To protect the company's data/intellectual property. (1) (Max 1)	1 (AO 1.2)	Accept for MP1 malicious attacks/traffic

AS - Level

7	a	<ul style="list-style-type: none"> - Stands for "Transmission Control Protocol / Internet Protocol"... (1) - Protocol(s)/set of rules... (1) - ...for communicating across a network / the internet. (1) - Each protocol belongs to a different layer. (1) - The layers are: Application, Transport, Internet, Link (1) - (Starting at the Application layer) data is further encapsulated as it is passed to the next layer. (1) 	1 AO1.1 2 AO1.2	Accept layers in any order. Accept Data Link instead of Link. Ignore any mention of Physical layer. Do not accept Network for Internet layer. MP3 is dependent on either MP1 or MP2 being awarded.
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1	i	<ul style="list-style-type: none">-Provides a link between (local area) networks-To connect the student and / or teacher and / or administration networks together.	2	<p>2nd mark must be in context.</p> <p>Examiner's Comments</p> <p>This question was poorly attempted by most candidates with many candidates not contextualising their response.</p>
	ii	<ul style="list-style-type: none">-Provides a link between two dissimilar networks-Links the school networks to the Internet	2	<p>Accept connect a LAN to a WAN for 1st bullet point 2nd mark must be in context.</p> <p>Examiner's Comments</p> <p>As above, in general, candidates were not clear in their description of how this device would be used.</p>

**If you found this
useful, drop a follow
to help me out!**

THANK YOU!

GCST