

Mark Scheme for January 2011

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There are 100 marks available for this assessment. They are allocated as follows:

- Pre-release material 30 marks
- Section A of test paper 50 marks
- Section B of the test paper 20 marks

Pre-release material

Task 2

Produce a logical network diagram for a star to demonstrate to the managing director how the network will be connected together. Your diagram should be labelled to show how computers, servers, connecting equipment and other hardware will be connected together.

Correct diagram showing a star network:

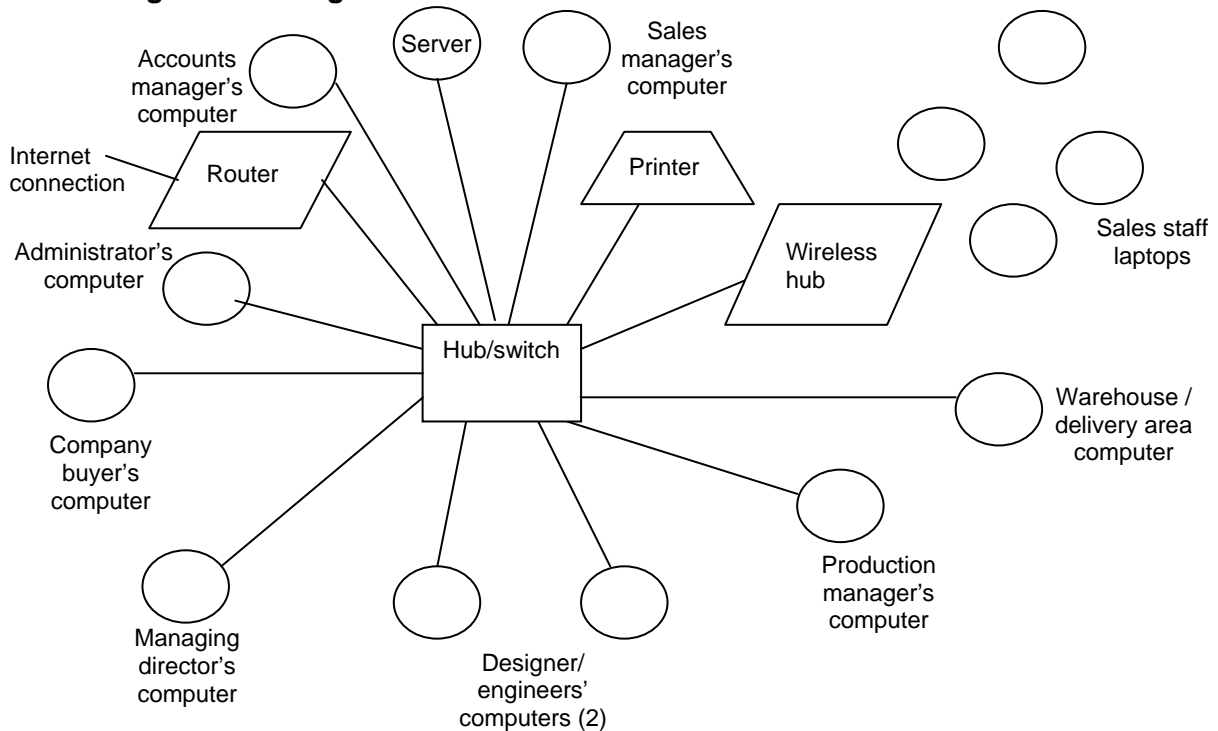


Diagram shows a star network – 1st mark

Internet connection shown on network – 1 mark

Identification of individual computers – 1 mark for each 3 up to a maximum of 3 marks

Identification of printer connected to network (either directly or through print server) – 1 mark

Identification of sales staff laptops connected to network – 1 mark

Identification of a server computer – 1 mark.

Up to a maximum of 6 marks

[6]

Complete Table 1. List all the connecting equipment identified in your diagram and, for each, justify your choice of component. (Each component must be shown on the diagram and listed in the table).

One mark each for identification of up to four items of appropriate hardware. Up to 2 marks for justification of each

Hardware component (on diagram)	Justification
Hub or switch	Central connection point (1) simple to set up (1) easy to add extra nodes (1) hub only - suitable for small number of nodes in this case (1) switch only - more secure than a hub (1) suitable because there will be a lot of simultaneous access in the company (1)
Modem/Router	Makes the connection to the internet (1) allows sharing of internet connection (1) directs internet traffic to correct part of network (1) required for all employees to have internet access using the same connection (1) cheaper to use one connection (1)
Wireless hub	Central connection point for laptops (1) allows easy connection for mobile computing (1) doesn't require wiring or need to plug in (1) sales people will use laptops when in office but want to take them on sales calls (1)
Cables	Fast secure data transfer (1) directly from central connection device to node (1) less prone to interference than wireless (1) more appropriate in office where nodes are static (1)
NIC/Wireless adapter	Provides interface to network(1) for an individual computer(1)
Patch panel/repeater	Tidier wiring (1) can allow for more connections (1) as RGC expands (1) Boosts signal (1) to cover longer distances (1) such as in the warehouse(1)

Maximum 12 marks

[12]

Briefly evaluate the method(s) you used to complete this task.

Some comment is made on method(s) used (1)
A strength or a weakness of the method(s) used is identified (1)
A strength and a weakness of the method(s) used is identified (1)

[3]

Task 3

The RGC network will be connected to the internet to enable access from every computer. Ms Green has asked you to evaluate two methods of connecting the network to the internet.

Band	Mark range	
H	7 - 9	<p>Candidates will show a clear understanding of the task by giving a full, appropriate evaluation of identified methods. The evaluation is wholly relevant to connecting the RGC network to the internet.</p> <p>The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p>
M	4 - 6	<p>Candidates will show an understanding of the question by identifying connection methods and giving relevant reasons for their use. Some relevant reference to RGC is made.</p> <p>The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation technical terms will be mainly correct.</p>
L	0 – 3	<p>Candidates will demonstrate a limited understanding of the question and will identify and describe connection methods. Little or no reference to RGC will be made.</p> <p>Information will be poorly expressed and there will be a limited, if any, use of technical terms.</p> <p>Errors of grammar, punctuation and spelling may be intrusive.</p>

May include :

Connection methods (M)	Evaluation (+, -, E)
ADSL DSL Cable broadband	<p>FOR - High speed connection / can be shared without unacceptable delay.</p> <p>AGAINST - More expensive method to set up and run.</p> <p>SUITABILITY – most suitable method as download speed will be needed in order for all RGC employees to have access.</p>
Mobile broadband	<p>FOR – reasonable speed could be used by sales staff when away from the office</p> <p>AGAINST – extra h/w (dongle) needed and extra subscription</p> <p>SUITABILITY – not suitable as not reliable enough at the moment/ not worth extra cost.</p>
ISDN leased line	<p>FOR – useful when other broadband methods not available/ sole use of line so access speed is constant</p> <p>AGAINST – old technology/expensive</p> <p>SUITABILITY – not suitable due to cost</p>
Dial up	<p>FOR – cheap / easier to set up in first instance / connect modem to existing telephone line.</p> <p>AGAINST – too slow for a shared connection.</p> <p>SUITABILITY – too slow for a shared connection at RGC.</p>

[9]

Section A Mark Scheme January 2011

1 (a) Explain two methods that RGC could use to share information across the network

Up to three marks for explanation of each method, eg:

Could share information through email (1) can attach important files (1) no need to leave desk (1) can get an answer as soon as recipient is ready (1) can send emails to multiple recipients to share information more widely (1)

Could share information on an intranet/extranet (1) anyone on the network can have access to this information (1) can upload files (1) can download files (1) can be used to publish notices for all staff (1)

Could use discussion forums (1) staff can post messages on particular topics (1) staff can reply to messages (1) everyone can see all messages (1) can moderate it so that management knows what is being shared (1)

Could use file exchange for staff working from home or elsewhere (1) forms could be uploaded (1) or sent by email (1) or sent/received using specialist software (1) would be password protected (1)

[6]

(b) Identify two resources, other than information, that can be shared more easily at RGC when they have a network and describe how each would be used.

1 mark each for identification of any two resources from eg:

- Printers/scanners
- data
- data storage
- software

Up to 2 marks each for a relevant description of how the resource would be used:

Printers – connected to a print server (1) accessed through a print queue (1) all computers on network access the same printer (1) some staff are given priority for use (1)

Data storage – one large storage device for all data (1) no storage on individual computers (1) data accessed by all computers on network (1) kept in one place for backing up (1)

Software – shared by using an application server (1) all clients share one copy of the software (1) all computers use the same version of the software (1) software is updated on the server (1)

[6]

2 Describe one benefit for the sales staff at RGC of having access eCommerce.

One mark for benefit and a further mark for expansion:

eCommerce –

- can sell online (1) customers don't have to come to shop (1)
- can have a wider customer base (1) due to spread of internet (1)
- can keep track of how much interest there is (1) using web technologies (1)
- sales staff can concentrate their efforts on getting new customers (1) existing customers can be referred to the ecommerce site (1)

[2]**3 Explain one advantage and one disadvantage to RGC of using of a star network topology.**

One mark each for an advantage, a disadvantage plus up to two further marks for expansion, relevant to RGC, of each:

Advantage

- easy to set up (1) for a small company such as RGC (1) with less than 25 employees (1)
- flexible (1) sales staff can join and leave the network (1) as they are not always office based and need to be able to join the network (1)
- easy to add new nodes (1) RGC is an expanding company (1) and would need to add staff to the network (1)

Disadvantage

- can be slow if there is a lot of traffic (1) everyone at RGC is likely to be using it at the same time (1) during office hours (1)
- prone to failure of the hub (1) all employees would depend on the hub to access the server and the internet (1) could decentralise some work so available even if the hub fails (1)

[6]

4 RGC could choose to implement an intranet and an extranet.
(a) Explain the terms ‘intranet’ and ‘extranet’.

Up to 2 marks for explanation of the term ‘intranet’
 information service (1) hosted on an internal web server (1) using WWW technologies (1)
 accessed by username and password (1) only accessed internally on the company network (1)

Up to 2 marks for explanation of the term ‘extranet’
 similar to intranet (1) but accessed over the internet (1) by username and password (1) hosted
 on company web server (1) using same technologies as intranet (1) **[4]**

(b) Discuss the implications of RGC using an intranet and an extranet.

Band	Mark range	
H	7 - 9	Candidates will show a clear understanding of the question by fully explaining at least one advantage and disadvantage of the use of intranets and extranets. Appropriate recommendations will be made. The discussion is wholly relevant to RGC. The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.
M	4 - 6	Candidates will show an understanding of the question by describing an advantage and a disadvantage of the use of intranets and extranets. Some recommendation is made. The discussion is mostly relevant to RGC. The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation technical terms will be mainly correct.
L	0 - 3	Candidates will demonstrate a limited understanding of the question and will have described at least one advantage or disadvantage. Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.

Advantages (+)	Sharing of same information - Available to all employees Secure information sharing - only accessed within the company network – accessed by username and password In same way as internet - easy to use for employees used to the internet
Disadvantages (-)	Content must be managed - a member of staff must be responsible for this – may need training Could be a security risk – if staff are careless in its use – introducing the possibility of viruses, etc Requires all staff to have access to the internet at home – if used to show important information
Recommendations (Rec)	suitable for RGC – can share information about new products – can allow sales staff to access the information when away from the office – could be used to transfer files Unsuitable for RGC – as the company is too small to justify the manpower needed to run an intranet and extranet -

[9]

5 The RGC network has a company-wide internet connection.

Describe two functions of a proxy server in this network.

One mark each for up to two functions and a further mark for expansion of each:

- Inspects web pages (1) for integrity (1)
- Matches received pages to requested (1) to ensure that they go to the correct computer (1)
- Caches frequently accessed pages (1) so that they can be accessed more quickly (1)
- Can block certain sites (1) for extra security (1)

[4]

6 The main server on the RGC network will be a file server.

(a) Describe two functions of the file server on the RGC network.

(b) Identify three benefits of using the server to manage network security.

(a) One mark for function and one for expansion of up to two of:

- stores files for users (1) of client computers (1)
- logs users in (1) to access services (1)
- retrieves files for users (1) on request (1)
- sets access rights (1) by password (1)

[4]

(b) One mark each for up to three benefits:

- central file storage /back up
- central security
- users can access files from any computer
- local storage is not needed on clients
- easier to keep track of what is stored on the network

[3]

7 RGC will need some protocol software to enable the computers on their network to communicate effectively with each other.

- (a) Identify a suitable protocol for the RGC network.
 (b) Explain what this protocol does.
 (c) Describe why this protocol is suitable for the RGC network.

(a) One mark for any of:

- NetBEUI
- NetBIOS
- TCP
- IP

[1]

(b) Up to three marks for an explanation of any of:

NetBEUI – standard for transfer of data on local area networks (1) programmable version of NetBIOS (1) uses data frames to package data (1) identifies devices by MAC address (1)

NetBIOS – standard for transfer of data on local area networks (1) uses data frames to package data (1) identifies devices by MAC address (1)

TCP – standard for transfer of data on internet (1) data is transmitted in packets (1) protocol software guarantees delivery of data (1) requests resend if data received incorrectly (1) packets are acknowledged when received (1) used by other protocols to do the actual sending of data (1)

IP – standard for addressing hosts on the internet (1) the protocol defines the standard way to assign addresses (1) example address eg 192.68.123.20 (1) each host on the network must have a unique IP address (1) routers find computers to send data to using the IP address (1)

[3]

c) One mark for reason plus one for expansion of:

NetBEUI – LAN protocol (1) can be adapted if necessary (1)
 common protocol (1) comes with major operating systems (1) works with TCP/IP (1)

NetBIOS – common protocol (1) comes with major LAN operating systems (1) works with TCP/IP (1)

TCP – necessary for RGC to use internet (1) routes packets to/from it (1) makes connection to the internet more simple (1)

IP - necessary for RGC to use internet (1) will identify individual computers for routing (1) makes connection to the internet more simple (1)

[2]

Total for Section A [50]

Section B Mark Scheme January 2011

8 Describe one way that a communications log can be used to help maintain a network.

One mark for a way plus a further mark for expansion:

- Records all data transfers (1) so that the transfer taking place at the time of a problem can be identified (1)
- Shows which parts of the network have heavy traffic load (1) by identifying where data transfers are taking place (1)

[2]

9 When a connection is set up between a network and the internet it is common practice to document all the settings.

Explain the reasons for documenting all the settings.

Up to three marks for explanation:

So that the connection can be reset (1) in exactly the same way (1)
if the connection needs to be reset (1) or if another connection is required (1)
can be referred to if things go wrong (1)

[3]

10 Back strain is often associated with poor workstation design.

Explain how a workstation can be designed to reduce this risk

Maximum of two marks for a list or points only

eg

- Height of monitor (1) so that user's eyes are at the correct level (1)
- Adjustable chair (1) helps correct posture (1), suitable for different people (1), can sit at correct height (1)
- Adequate desk space (1) can sit in comfortable position for main tasks (1)

[4]

11 Evaluate the methods that an organisation can use to maintain security on a network that is connected to the internet.

Band	Mark range	
H	9 - 11	<p>Candidates will show a clear understanding of the task by giving a full, appropriate evaluation of identified methods. The evaluation is wholly relevant to local networks that are connected to the internet.</p> <p>The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p>
M	5 - 8	<p>Candidates will show an understanding of the question by identifying methods and giving relevant evaluation, which may be one-sided and given in general terms.</p> <p>The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation technical terms will be mainly correct.</p>
L	0 - 4	<p>Candidates will demonstrate a limited understanding of the question and will identify and give a brief description of methods.</p> <p>Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.</p>

May include:

Method (M)	Evaluation (+,-,S)
Backing up	<ul style="list-style-type: none"> + provides security against total loss of data + ensures a copy of all data on the network so it can be reinstated - needs to be carried out at regular intervals - needs to be stored at a separate location
Passwords	<ul style="list-style-type: none"> + can force users to use strong passwords and change regularly + no access to the network without passwords + strong passwords can be used to increase security from cracking - users need to be instructed on how to keep passwords secure - passwords don't protect against employee error - password policies need to be in place
Blocking of downloads	<ul style="list-style-type: none"> + so that unwanted software does not get onto the network - software for blocking needs to be updated
Auditing of software	<ul style="list-style-type: none"> + detects any unlicensed software on the network - takes time to carry out
Virus checking	<ul style="list-style-type: none"> + AV software can detect viruses before they enter the system + can be set to run at regular intervals - needs to be updated regularly - needs to be installed on every networked computer
Protection against theft over the internet	<ul style="list-style-type: none"> + firewall software can block unwanted access to system + can block access to harmful websites - need to keep firewall software up to date

[11]

Total for Section B [20]

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