

Mark Scheme for June 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

Use the diagrams in Fig.1 and Fig.2 to produce a physical network diagram that shows a star network relevant to RGC. Your diagram should be labelled to show where computers, servers, connecting equipment and other hardware will be sited and how it will all be connected together.

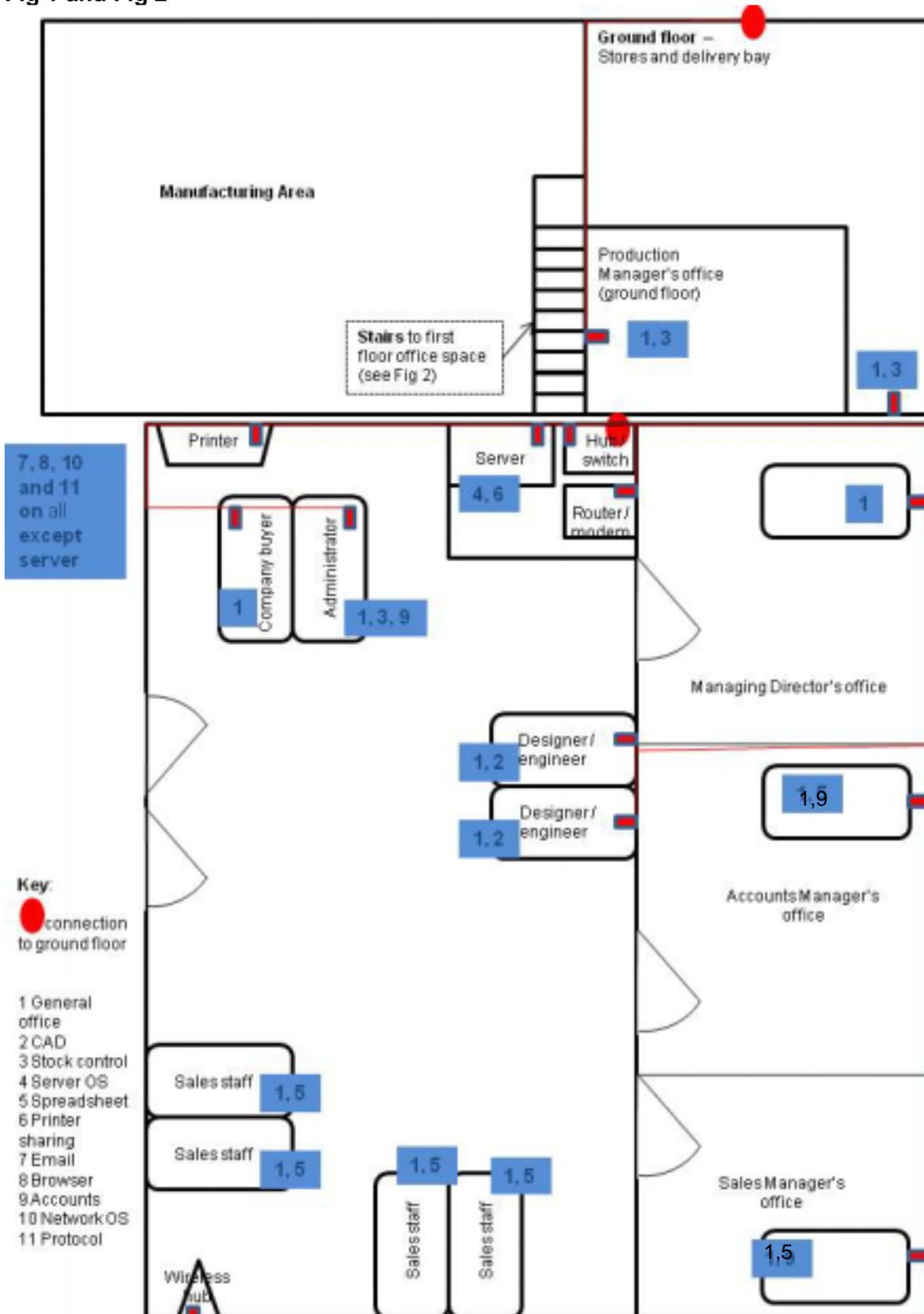
For each computer, add a label to show the software that will be installed.

- A Diagram shows everything connected together – 1 mark
- B Cabling is sensibly placed around walls (or across ceiling or under floor) – 1 mark
- C Server appropriately placed and connected – 1 mark
- D Connecting devices appropriately placed and connected – 1 mark
- E Printer appropriately placed and connected – 1 mark
- F Server OS shown on server – 1 mark
- G Network OS shown on all client computers – 1 mark
- H Protocol software shown on all computers – 1 mark
- I Email and browser software shown on all client computers – 1 mark
- J General office software shown on all client computers – 1 mark
- K CAD software shown on designer/engineer computers – 1 mark
- L Stock control software shown on administrator computer or on production manager and warehouse computers – 1 mark
- M Spreadsheet software shown on sales computers – 1 mark
- N Printer sharing software shown on server or on print server if included – 1 mark
- O Accounts software shown on accounts manager's computer – 1 mark

Up to a maximum of 10 marks

[10]

Fig 1 and Fig 2



Task 2

Using the table headings given in Table 1, list all the software identified in your diagram and, for each item of software, justify its installation on the relevant computers.

No mark for identification (on diagram already). Up to two marks for a justification of up to four different types of software.

Software (on diagram)	Justification for installation
General office s/w	Completion of standard paperwork (1) all employees able to complete a variety of tasks (1) employees will generally be familiar with this software (1)
CAD s/w	Specialist software for designers/engineers (1) makes task of producing designs more efficient (1) can make changes before printing to save paper (1)
Stock control s/w	Allows warehouse to keep control of goods and supplies in stock (1) can operate just in time system to make best use of storage space (1) improves the estimation of delivery time for customers (1)
Server OS	Manages services for all other machines (1) allows central storage of stock data (1) all relevant employees can see and change stock data (1)
Spreadsheet s/w	Familiar software for sales staff (1) can be adapted for particular use in RGC (1) most employees familiar with software (1) part of general office package so less expense (1)
Printer sharing s/w	Allows all employees to share one printer in office (1) ensures that printing jobs don't get lost when in queue (1) can be set to prioritise certain users such as delivery people (1)
Email s/w	Allows communication between employees (1) open link between two floors (1) allows communication with customers and suppliers (1)
Browser s/w	Allows ordering of supplies online (1) can check progress of deliveries (1) can use for research into new products and technologies(1)
Accounts s/w	Formulated specially to make job of accounts manager easier (1) no need to customise spreadsheet to do the work (1)
Network OS/Network client software	Required to allow computers to access the network (1) allows computer to use the services of a server (1) users should be unaware that they are using a special OS (1)
Protocol s/w	Ensures that all computers are able to communicate with each other (1) ensures that all computers are able to communicate on the internet (1)

[8]

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

Write a short article for RGC to explain how to configure a computer that is connected to their network to enable it to access the internet and the World Wide Web.

Band	Mark range	
H	7 - 9	<p>Candidates will show a clear understanding of the task by fully explaining the steps involved in the configuration of the computer, explaining how each is carried out. The explanation is wholly relevant to providing access to the internet through the RGC network.</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 some understanding of the task by explaining the steps involved in the configuration of the computer and giving some explanation of how the tasks are carried out. 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 task, and will identify some steps involved in the configuration of the computer, with little or no explanation. 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:

Configuration Steps (S)	How carried out (H)
Set computer to use TCP/IP protocol	Change network settings selecting to use the TCP/IP protocol on this computer
Configure IP address	Change network settings to have IP address assigned by RGC domain server when computer joins the network. OR set up IP address for this computer referring to a list of IP addresses that can be used at RGC
Change a network setting to use or bypass RGC's proxy server	Enter the IP Address of the proxy server or set to bypass proxy server. Join computer to the RGC internet domain that contains the proxy server
Install web browser software	Copy all installation files, set home page, set as default web browser in internet options. Change connection settings to get computer to ask RGC's proxy server for access when using HTTP protocol.
Install ftp software	Copy all installation files. Change connection settings to get computer to ask RGC's proxy server for access when using FTP protocol
Document all settings	Write down all steps carried out. For each, record licence numbers, domain names, IP address settings, RGC's proxy server name and port, any settings relevant to this computer and any RGC firewall settings relevant to this computer. Store for future reference.
Produce an installation report	Record the date of installation, who carried it out, name of document where all settings are recorded, any special settings for the individual computer. Store for future reference.

[9]

Section A Mark Scheme June 2011

1 Identify one facility of email and explain how RGC could use this facility.

One mark for identification of a facility and up to two marks for an explanation of use:

eg

- Group emails (1st) to communicate information to multiple people at the same time (1) such as sales information to all sales staff (1)
- Can attach documents to emails (1st) for quick transfer between staff (1) and immediate confirmation of receipt (1) relevant example of use (1)

[3]

2 Explain two potential drawbacks for RGC, other than loss of security, associated with introducing a network

Up to three marks for explanation of up to two drawbacks.

Answers must relate to RGC

Cost of installation (1) need to buy expensive equipment (1) file server must be high spec and therefore expensive (1) need to pay for installation (1) time to get data on network is costly (1) RGC is a small company with limited funds (1)

Cost of maintenance (1) need to allocate at least one member of staff to manage the network (1) need to pay for that member of staff (1) server needs to be maintained (1) access to data on server not possible during maintenance (1) RGC will need to allocate funds and time (1)

Dependence on network devices such as servers (1) if the server fails much work will stop (1) staff depend on network for information or access to shared resources (1) broken connections or lost passwords cause loss of access (1) heavy use of resources might slow work down for individual RGC users (1)

[6]

3 Explain the benefits for the designers/engineers at RGC of having access to each of the following WAN services:

- **Discussion forums**
- **Data file exchange**

Up to three marks for each explanation:

Discussion forums – can discuss current design issues with other engineers (1) can get tips on how to do things (1) can get opinions on new technologies (1) can find out how other organisations are using new technologies (1) can ask others for advice on current practice in the industry (1) can gain information from other designers/engineers (1)

Data file exchange – can send drawing files to outside manufacturers electronically (1) this will help to save time (1) can receive drawing files from suppliers electronically (1) drawings will be ready for use on the network (1) can easily send and receive important documents (1) with quick confirmation of receipt (1)

[6]

4 Describe one way that RGC can protect the security of its data in case of technical failure.

One mark for identification of a way and a further mark for expansion of:

- Back up (1) regularly, ensuring all backed up data is up to date (1)
- Share data between devices (1) rather than keeping it all in one place (1)
- Can use RAID technology (1) to spread the data over a number of disks (1)

[2]

- 5 RGC can choose to implement a peer-to-peer network or a client-server network.**
- a) Explain the terms ‘peer-to-peer and ‘client-server’ with reference to local area networks.
 - b) Discuss the implications of RGC choosing a client-server network.

(a)

Up to two marks for each explanation:

Peer-to-peer – all computers in the network are equal (1) each can provide some services for other computers (1) each can use services of other computers (1) each computer will be configured differently (1) data is stored locally (1)

Client-server – contains one or more servers (1) all other computers are clients (1) clients request services from servers (1) such as file storage/printing/internet access (1) server provide those services on request (1)

[4]

(b)

Band	Mark range	
H	7 - 9	<p>Candidates will show a clear understanding of the question by giving a full, appropriate discussion of the positive and negative implications of a client-server network, which draws some relevant conclusions. The discussion is wholly relevant to RGC.</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 describing positive and negative implications of choosing a client-server network. The discussion may be one-sided. Some 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 positive and negative implications. A candidate may refer to reasons for not choosing a peer-to-peer network. Little or no reference to RGC is made.</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>

Positive implications (+)	<p>network can be managed centrally – this can be more secure for RGC's data – this makes management easier</p> <p>users are not dependent on one computer – if there is a problem they can move to another computer</p>
Negative implications (-)	<p>dependence on central server – if this fails no work can be done</p> <p>users have less responsibility for data – this can lead to carelessness</p> <p>there are difficulties with access to data when away from the office – for the sales staff</p> <p>needs careful management – with staff allocated to this task</p>
Conclusions (C)	<p>unsuitable for RGC – as the company is too small to justify the extra cost</p> <p>suitable for RGC – as there is a need to share data between users and departments – the company will need to share resources such as printers and the internet – the company is expanding and could take on a new member of staff</p>
	[9]

6 Recommend, with reasons, a suitable connection media for the local area network at RGC.

Twisted pair cabling (1st) – fast data speeds (1) up to 1000 Mbps (1) covers suitable distance up to 100m (1) secure transmission (1) commonly used and so easy to get connection devices (1) flexible (1) sales staff can have a network point at their desk (1)

Wireless (1st) – easy to install (1) all computers within a small range (1) no need to drill through walls (1) sales staff can join network easily (1) no need to hide wiring (1) should be fast enough (1) sales staff could join other networks without extra technology (1)

[4]

7 RGC will use a star network that will have a 48-port switch at its centre.

(a) Describe two functions of the switch.

(b) Explain why this switch is more suitable for RGC's network than a hub or smaller switch.

(a)

One mark for function and a further mark for an expansion of two of:

- Connects all computers together (1) making virtual connections between individual computers as necessary (1)
- Passes data from one port to another (1) using MAC addresses for identification (1)
- Can be programmed to divide the network into segments (1) to restrict the movement of data (1) to speed up the network (1)

[4]

(b)

Up to three marks each for **any two** explanations:

- Room for expansion (1) can accommodate up to 48 computers or other devices (1) RGC is an expanding company (1)
- More secure connection than a hub (1) direct connection made between individual computers (1) RGC will have some sensitive data on its network (1)
- Can be used to segment the network (1) if traffic levels become a problem (1) such as when RGC connects to the internet (1)

[6]

8 Identify the hardware required to allow a broadband internet connection to be shared throughout the RGC network and describe how it is used.

Up to three marks for explanation:

A router will be used (1st) to forward internet data to the correct computer (1) using its IP address (1) the telecommunications connection will be connected to the router (1) all requests for data will go through the router (1) all received data will go through the router (1)

[3]

9 Identify one service available to RGC that would allow employees to access confidential information while away from the office. Describe how this service would be used by RGC.

One mark for identification of service:

- extranet
- VPN

One mark for how service would be used plus a further mark for expansion of one of:

Extranet – company puts general information on extranet (1) employees access by username and password (1)

VPN – employees are given software to access VPN (1) username and password gives access to network as if they are in the office (1)

[3]

Total for Section A [50]

Section B Mark Scheme June 2011

10 Describe one advantage to a company of choosing broadband for its connection between its network and the internet.

One mark for an advantage plus a further mark for expansion:

- Fast transfer (1) even when the connection is shared (1) by many users (1)
- High bandwidth (1) to cope with lots of data transfers (1) or large files (1)

[2]

11 Explain what a problem log is and how it can be used to help identify recurring problems within a network.

Up to three marks for explanation:

File or set of files (1) holding information about problems that have occurred (1) where they occurred (1) the solutions (1) and who fixed them (1) files may be organised into a directory structure to make them easier to find (1) access rights are restricted to ensure access only by technicians (1)

One mark for how it can be used and a final mark for expansion:

- Can sort according to type of problem (1) to see if one type occurs multiple times (1)
- Can sort according to who reported the problem (1) to see if a particular computer has multiple problems (1)
- Can sort according to user (1) to see if training is required (1)

[5]

12 When a network is installed, measures must be taken to reduce the risk of electrocution. Explain one of these measures.

eg

- Ensure cables are intact (1) to ensure no exposed wires (1)
- Test equipment before installation (1) to eliminate faults (1)
- Switch off power before installation (1) to remove danger when connecting equipment (1)

[2]

13 Evaluate the use of a mesh topology for a small network of 20 computers.

Band	Mark range	
H	9 - 11	<p>Candidates will show a clear understanding of the task by giving a full, appropriate evaluation of the topology. The evaluation is wholly relevant to a small network of 20 computers.</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 describing advantages and disadvantages the topology and draw conclusions 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 advantages and disadvantages and give a brief description of the topology.</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:

Advantages (A)	Disadvantages (D)	Conclusions (C)
<p>Fast data transfer</p> <p>Direct link between individual computers</p> <p>Can be more secure</p> <p>Faults have less impact than other topologies due to alternative paths available to bypass broken links</p>	<p>Large number of connections</p> <p>Every computer must be configured to know what it is connected to</p> <p>Large amount of cabling required</p> <p>Very expensive in terms of equipment</p> <p>Very difficult to expand as multiple new connections will be needed each time</p>	<p>Would not recommend a mesh for this size of network</p> <p>A company of this size would not want the expense</p> <p>Maintenance of this type of network would require too many people for a company of this size</p>

[11]

Total for Section B [20]

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