

**GCE AS**

**Applied Information and  
Communication Technology**

**Summer 2010**

**Mark Schemes**

Issued: October 2010



MARK SCHEMES (2010)

Foreword

*Introduction*

Mark Schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

*The Purpose of Mark Schemes*

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of 16- and 18-year-old students in schools and colleges. The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes therefore are regarded as a part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

The Council hopes that the mark schemes will be viewed and used in a constructive way as a further support to the teaching and learning processes.

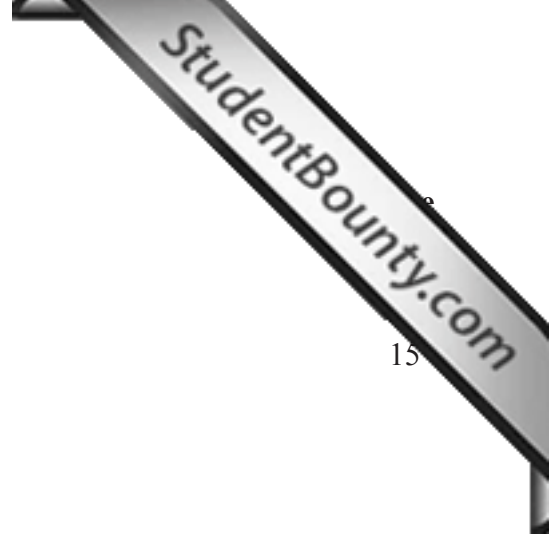


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15







*Rewarding Learning*

**ADVANCED**  
**General Certificate of Education**  
**2010**

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**Applied Information and  
Communication Technology**

Assessment Unit A2 7

*assessing*

Unit 7: Investigating Systems

**[A6J11]**

**TUESDAY 18 MAY, AFTERNOON**

---

**MARK  
SCHEME**

1

| Reason                 | Explanation                                                                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reduce paperwork       | Reference to many paper documents – appointment books /weekly schedule on notice board/ new client notebook/ appointment cards/ client file/payment ledger book.<br>Less time consuming. |
| Competitive advantage  | Make them more able to deal with the needs of the public especially as the business is growing rapidly.<br>Customers now expect businesses to be computerised. Improved company image.   |
| Improved communication | Opportunity for a web presence and email access internally. More professional documentation for clients. Easier to contact customers.                                                    |
| Accuracy               | All calculations should be correct – will know whether or not clients have actually paid their cancellation fee.                                                                         |
| Protection of data     | Data will be stored once and stored securely/ backups carried out automatically/ no risk of paper based records being damaged/ destroyed.                                                |

([1] for each of the above or other similar justification)

[5]

5

- 2 (a) – Only get the views and opinions of one person  
 – Janet is not involved with the duties that all of the staff carry out  
 – Janet may have misconceptions about what the other members of staff actually do  
 – Important to make all potential users feel involved from the onset of such a project.  
 – Must be seen to seek input from a range of sources.

([1] for each of any **two** reasons from above list or other suitable alternative)

[2]

- (b) Appointment date  
 Room No  
 Therapist No  
 Therapist Name  
 Treatment description  
 Type of appointment

([1] for each of any **two** reasons from above list or other suitable alternative)

[2]

4



3

| Person             | Phase(s)                                          | Reason for Communication                                                                                                                                                                          |
|--------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Janet Legg         | Throughout the whole project                      | System owner. Has an understanding of the whole process and knows what the system must do for the business. Has ultimate responsibility for making decisions regarding costs and time scales. [1] |
| Hardware suppliers | Implementation                                    | Need to source hardware to meet the requirements identified in the system specification. [1]                                                                                                      |
| Programmers        | Coding/<br>Testing                                | Need to ensure that user requirements are clearly understood. Two way communication ensures that no confusion exists during development of new system. [2]                                        |
| Users              | Investigation/<br>Analysis/<br>Testing/<br>Review | Need to be involved through the project if they are going to have buy-in for the new application. Important that they feel involved and can openly voice concerns or opinions. [2]                |

[6]

6

4

|                              | Feasibility Study | System Specification | Technical Gude | User Guide |     |
|------------------------------|-------------------|----------------------|----------------|------------|-----|
| Implementation plan          |                   | ✓                    |                |            | [1] |
| Terms of reference           | ✓                 |                      |                |            | [1] |
| Entity relationship models   |                   | ✓                    |                |            | [1] |
| Adding new hardware          |                   |                      | ✓              |            | [1] |
| Test data                    |                   | ✓                    |                |            | [1] |
| Creating a new user account  |                   |                      | ✓              |            | [1] |
| Adding a new supplier        |                   |                      |                | ✓          | [1] |
| Data flow diagrams           |                   | ✓                    |                |            | [1] |
| Cost benefit analysis        | ✓                 |                      |                |            | [1] |
| Problems with current system | ✓                 |                      |                |            | [1] |

[10]

| AVAILABLE MARKS |
|-----------------|
| 10              |

5 (a) Treatment, appointment [2]

**(b) Mark Band ([1]–[2])**

Candidate provides a basic answer showing limited understanding of the requirements of business information.

Limited knowledge and understanding displayed.

Limited reference to specific examples from query and report.

Reference made to calculations in report.

Differences in query and report identified.

Basic written communication.

**Mark Band ([3]–[4])**

Candidate provides a competent answer indicating understanding of the requirements for business information.

Some knowledge and understanding displayed.

Differences in query and report discussed.

Reasonable discussion of report producing structured, meaningful output.

Reference to the fact that summary data or calculations have been included and provide useful business information.

Appropriate level of written communication

**Mark Band ([5]–[6])**

Candidate provides a very competent answer showing thorough understanding of effective business information.

Very good knowledge and understanding displayed of information requirements.

Reference to flexibility of output – i.e. by month

Consideration to other options – by treatment/by customer etc

Specific examples included.

Reference made to the difference between data and information.

Very effective written communication

[6]

8

6 (a)

SALE table

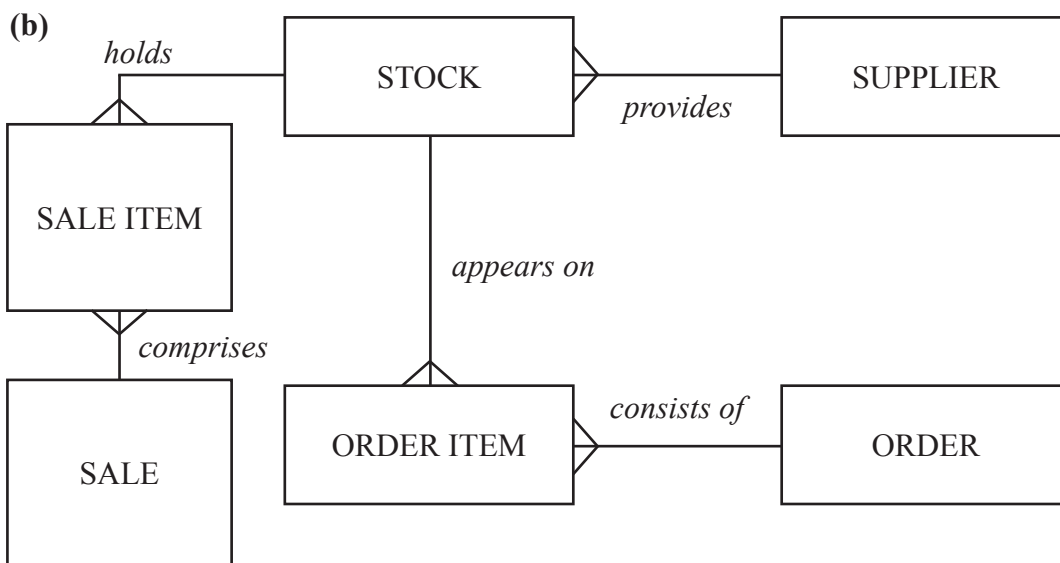
| Field name     | Data type                       | Description               | Sample Data |     |
|----------------|---------------------------------|---------------------------|-------------|-----|
| Sale ref       | Autonumber                      | Primary key               | P002        |     |
| Sale date      | Date/Time                       | Default to today's date   | Exam date   | [2] |
| Payment method | Text, 11 or list box or look up | Cash, cheque, credit card | Cash        | [1] |

SALE ITEM table

| Field name | Data type            | Description                | Sample Data |     |
|------------|----------------------|----------------------------|-------------|-----|
| Sale ref   | Number, long integer | Primary key or Foreign key | P002        | [2] |
| Stock no.  | Text, 4              | Primary key or Foreign key | S-05        | [1] |
| Quantity   | Number               | Number of items required   | 1           | [1] |

} N.B. Composite Key

[7]



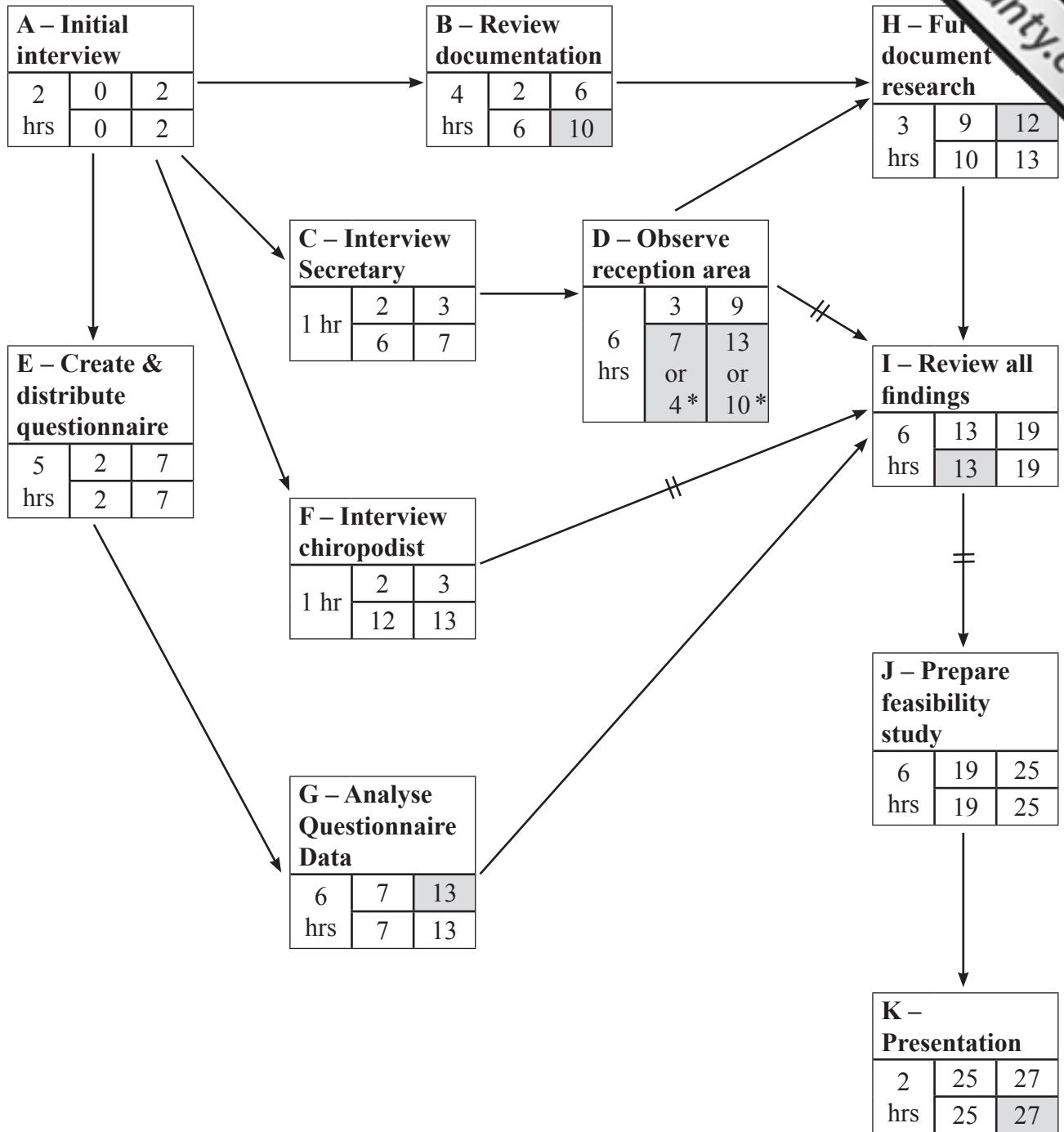
One to many relationship between STOCK and SALE ITEM [1]

One to many relationship between SALE and SALE ITEM [1]

[2]

9

7 (a)



3 additional arrows to be included  
 7 shaded fields completed.

\* Either response was deemed acceptable and should be credited.

[10]

| AVAILABLE MARKS |
|-----------------|
|                 |

- (b) A – initial interview
- E – create & distribute questionnaire
- G – analyse questionnaire data
- I – review all findings
- J – prepare feasibility study
- K – presentation [1]

**(c) Mark Band ([1]–[2])**

Candidate provides a basic answer showing limited understanding of project management process.  
 Limited knowledge and understanding displayed.  
 Reference to the fact that an additional analyst will provide additional time resource.  
 No or incorrect reference to critical path activities.  
 Basic written communication.

**Mark Band ([3]–[4])**

Candidate provides a competent answer indicating understanding of the project management process.  
 Specific activities identified and the additional analyst allocated to these.  
 Some knowledge and understanding displayed of critical path.  
 Appropriate level of written communication

**Mark Band ([5]–[6])**

Candidate provides a very competent answer showing thorough understanding of project management.  
 Very good knowledge and understanding displayed of critical path and its relevance within the technique.  
 Additional resource only allocated to activities on the critical path.  
 Understanding of slack shown.  
 Very effective written communication [6]

17

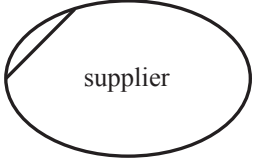

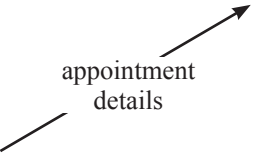
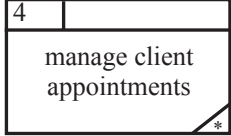


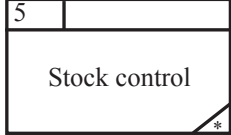
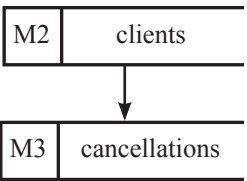
8

|                                                                           |       |
|---------------------------------------------------------------------------|-------|
| The same font size should be used on all text.                            | FALSE |
| The users should be consulted regarding colour choices.                   | TRUE  |
| Graphics must be included on all screens.                                 | FALSE |
| Data entry should be easily entered.                                      | TRUE  |
| Navigation is not needed on every screen.                                 | FALSE |
| Screens should use a similar layout to current paper based documentation. | TRUE  |
| Chris Smith will make the final decision regarding screen layout.         | FALSE |

[7]

7

9

| Component                                                                           | Context | Level 1 | Neither |
|-------------------------------------------------------------------------------------|---------|---------|---------|
|    |         |         | ✓       |
|    |         | ✓       |         |
|    | ✓       | ✓       |         |
|   |         | ✓       |         |
|  | ✓       | ✓       |         |
|  | ✓       |         |         |
|  |         |         | ✓       |
|  |         |         | ✓       |

([1] for each row correctly completed)

[8]

| AVAILABLE MARKS |
|-----------------|
| 8               |



10 (a) Acceptance testing or end user testing [1]

- (b) There may be further errors.  
 Should ensure that system is error free before users test it  
 Errors in calculation should have been discovered during program testing  
 Acceptance testing is the final stage of testing – so basic errors should have been picked up before now.  
 Time and costing issues.  
 Error messages not appearing.

([1] for each of any **two** reasons from above list or other suitable alternative) [2]

(c)

|   | <b>Error</b>                               | <b>Possible Reason</b>                                                       | <b>Expected result</b>                                       |     |
|---|--------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------|-----|
| 1 | Total appointment calculation not correct. | Displaying total sum not total for category.                                 | BEAUTY 12<br>CHIROPODY 10                                    | [2] |
| 2 | Report date displayed incorrectly.         | Date is incorrect on the machine from which the report was run.              | 14th April 2010                                              | [2] |
| 3 | Does not reject invalid date value.        | Field not defined correctly as a date. Validation.                           | Should only accept valid dates – software will control this. | [1] |
| 4 | Does not reject incorrect category value.  | Validation rule not defined properly. Combo box used rather than a list box. | Should only accept BEAUTY or CHIROPODY                       | [2] |

**(d) Mark Band ([1]–[2])**

Candidate provides a basic answer showing limited understanding of the requirements of the testing process.  
 Limited knowledge and understanding displayed.  
 Basic written communication.

**Mark Band ([3]–[4])**

Candidate provides a competent answer indicating understanding of the testing process.  
 Some knowledge and understanding displayed.  
 Alternative types of testing described.  
 Reference made to people involved at each stage of testing.  
 Opinion provided on statement.  
 Appropriate level of written communication

**Mark Band ([5]–[6])**

Candidate provides a very competent answer showing thorough understanding of the testing process.  
 Very good knowledge and understanding displayed of the three types of testing – acceptance testing, system testing and program testing.  
 Justification for opinion given.  
 Detailed reference to importance of user in ensuring project success.  
 Very effective written communication

[6]

16

**11 (a) Contract with Dynamic Designs**

- Available as per terms of contract
- Experts
- Not reliant on just one person
- More experienced in trouble shooting
- Upgrades/patches provided as part of contract
- Comprehensive disaster recovery

([1] for each of any **two** advantages from above list or other suitable alternative) [2]

**Employ a Technician**

- Available as per terms of contract
- Will become an expert in the application
- Available to carry out other duties within the business
- Specific business knowledge

([1] for each of any **two** advantages from above list or other suitable alternative) [2]

- (b)** Alternative support options: Manuals; On line discussion forums; Technical CD; Google; On line diagnostic help; Bulletin boards  
Call centre.  
In house customised training.

**Mark Band ([1]–[2])**

- Candidate provides a basic answer showing limited understanding of the requirements of business information.
- Limited knowledge and understanding displayed.
- Alternative options suggested.
- Basic written communication.

**Mark Band ([3]–[4])**

- Candidate provides a competent answer indicating understanding of the requirements for business information.
- Some knowledge and understanding displayed.
- Range of options identified.
- Brief description of each option provided.
- Appropriate level of written communication

**Mark Band ([5]–[6])**

- Candidate provides a very competent answer showing thorough understanding of available ICT support options.
- Very good knowledge and understanding displayed of a wide range of options
- Detailed descriptions provided.
- Advantages and disadvantages of alternatives provided.
- Recommendation made with specific reference to personnel and requirements within TIP TOP TOES.
- Very effective written communication

|              |            |
|--------------|------------|
| [6]          | 10         |
| <b>Total</b> | <b>100</b> |





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**Applied Information and  
Communication Technology**

**Assessment Unit A2 13**

*assessing*

**Unit 13: Networking and Communications**

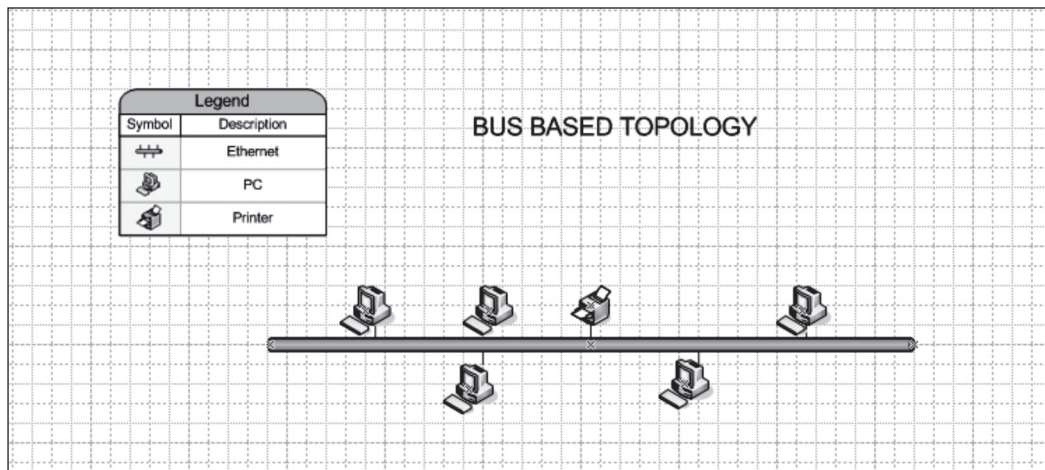
**[A6J71]**

**MONDAY 14 JUNE, AFTERNOON**

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**MARK  
SCHEME**

1 (a) Bus based Topology



Suitably labelled sketch  
(to include PC, cable, terminators, (or any other suitable detail), labels) [4]

To include any of  
(plus description) :

- Ethernet
- CSMA/CD
- Cable – coaxial
- 10 base 2

Any other correct detail [4]

8

2 Synchronous & Asynchronous

(a) timing at both devices

- Synchronous is timed using a clock signal
- It is regular
- Asynchronous is irregular
- Synchronous is faster

(b) Framing

- Synchronous
  - o Use of control codes such as BCC, STX, EOT, ETX, SOH, header, data packets, text
- Asynchronous
  - o Use of start, stop, parity bits, serial transmission

(c) arrival at destination

- Synchronous
  - o Regular arrival – bytes removed, block checking
- Asynchronous
  - o Start, stop stripped off
  - o Parity checking

Any 3 descriptions × [2] [6]

6

**3 Disadvantages of Networks**

- Security plus description
- Client server – server crash problem plus description
- The staff required to manage network need high technical skills
- Cabling is expensive to install and replace
- Installing software takes a long time
- There may not be access to a local printer.

Any other suitable disadvantage

Any 2 × [2]

[4]

4

**4 Network Card**

- Features
- Inserted into back of computer onto motherboard (or as a data-stick in USB)
- Uniquely identifies the computer in the network
- MAC address
- Wireless option
- Different types depending on network

Any other suitable feature

Any 3 × [2]

[6]

6

## 5 Wireless Network Issues

| Level of response | Marking criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mark band |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Excellent         | <p>Candidate discusses many issues of wireless networking.</p> <p>Their description will show a very good knowledge of the different properties of wireless networking.</p> <p>Their use of spelling punctuation and grammar are excellent and clearly legible.</p> <p>Their discussion of the security features of wireless networking shows a very good knowledge of WPA (and WEP).</p> <p>Their discussion uses an excellent form and style.</p> <p>Their discussion is highly coherent and is very well organized and they use a wide range of correct specialist terms.</p> | [9–12]    |
| Good              | <p>Candidate describes some issues of wireless networking.</p> <p>Their description will show a good knowledge of the different properties of wireless networking.</p> <p>Their use of spelling punctuation and grammar are satisfactory and legible.</p> <p>Their discussion of the security features of wireless networking shows a good knowledge of WPA (and WEP).</p> <p>Their discussion uses a satisfactory form and style.</p> <p>The discussion is coherent and is organized and they use a range of correct specialist terms.</p>                                      | [5–8]     |
| Poor              | <p>Candidate may discuss few of the issues of wireless networking.</p> <p>Their discussion of wireless networking is not organized and uses a poor form and style.</p> <p>Their use of spelling punctuation and grammar are poor and their work is not that legible.</p> <p>The discussion is coherent and may use few (if any) correct specialist terms.</p>                                                                                                                                                                                                                    | [1–4]     |

If there is not sufficient value in the answer a mark of zero will be awarded.



The discussion should include some or all of the following sections.

- Range – good locations
- Radio
- Bluetooth
- Standards
- Hardware requirements – access points, WIFI cards
- Security issues –WEP, WPA
- Hotspots
- Wardriving

Any other relevant section is acceptable.

[12]

12

**6 Router**

- Can connect two different layer 2 technologies – Ethernet, token ring
- Operates at Network layer (layer 3) of OSI model
- Examines IP addresses of incoming packets
- Determines best path for the packets
- Forwards them along that path
- Extensively used on the Internet
- Used for inter-network communication
- Can create broadcast domains

Any 3 × [2]

[6]

6

7 (a) **Server**

- One or more computers that send and process requests from one or more client machines, e.g. file server, mail server, web servers
- It is designed with some redundancy in power, computing and network storage
- User accounts
- Processes requiring a lot of processing typically placed on the server

Any 2 × [2] [4]

(b) **Cable**

- Type of cable – twisted pair – 10base T or similar
- Cat 5 or cat 5e

1 × [2] [2]

(c) **Workgroups**

Reasons

- It is good practice to place servers close to where they are used
- No need to use the switch X connected to the backbone
- Cuts down on excess traffic
- Different workgroups make different demands and slow down the backbone

Any 2 reasons × [2] [4]

(d) **Advantages of E-mail**

Useful business tool – attachments

Cost effectiveness

Instant

Can use at home – webmail

Any other suitable business reason

Any 2 × [2] [4]

14

8

| Level of response | Marking criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mark band |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Excellent         | <p>Candidate discusses all features of a successful network.</p> <p>Their description will show a very good knowledge of the features that make a successful network.</p> <p>Their use of spelling punctuation and grammar are excellent and clearly legible.</p> <p>Their discussion shows a very good knowledge of how the network is successful.</p> <p>Their discussion uses an excellent form and style.</p> <p>Their discussion is highly coherent and is very well organized and they use the correct specialist terms</p> | [7–10]    |
| Good              | <p>Candidate discusses a number of features of a successful network.</p> <p>Their description will show a good knowledge of the features that make a successful network.</p> <p>Their use of spelling punctuation and grammar are good and legible.</p> <p>Their discussion shows a good knowledge of how the network is successful.</p> <p>Their discussion uses a good form and style.</p> <p>Their discussion is coherent and is well organized and they use the correct specialist terms</p>                                  | [4–6]     |
| Poor              | <p>Candidate discusses a few features of a successful network.</p> <p>Their description will show some knowledge of the features that make a successful network.</p> <p>Their use of spelling punctuation and grammar may be weak.</p> <p>Their discussion shows a poor knowledge of how the network is successful.</p> <p>Their discussion uses a poor form and style.</p> <p>Their discussion may not be coherent and may be unorganised.</p>                                                                                   | [1–3]     |

If there is not sufficient value in the answer a mark of zero will be awarded.

The discussion should include some mention of:

Functional

- The network must do what it is supposed to do.
- It must be reliable and perform at an acceptable speed
- The user must be able to carry out tasks effectively

Scaleable

- They must be able to change to fit the needs of tomorrow
- It should be possible to increase the size of the network without major disruptions or changes in design

Adaptable

- A network must be able to embrace new technology
- A network must be able to respond to changes in the organisation

Manageable

- The network should be able to allow ease of monitoring and supervision

Available

- Needs to be on hand at all times
- There needs to some built in redundancy to the system

[10]

10

9

|                                                                                                                   |       |
|-------------------------------------------------------------------------------------------------------------------|-------|
| An RJ-45 connector can be found in star based Ethernet technologies.                                              | TRUE  |
| A token ring network passes a data frame called a baton between each machine which is connected to the network    | FALSE |
| In order for a network to function properly, it must use software called a network operating system.              | TRUE  |
| Repeaters in a network are used to extend the cable run of a network                                              | TRUE  |
| Networks which break down data into packets are a fairer way of sharing the medium on which the data will travel. | TRUE  |
| Bridges in networks often cause packet collisions.                                                                | FALSE |
| Hubs are used in networks to check a user's log on details such as passwords.                                     | FALSE |
| Star topologies are used extensively in wide area networks.                                                       | TRUE  |
| A network interface card is given a unique code by the manufacturer                                               | TRUE  |
| Terminators are found in bus based networks                                                                       | TRUE  |

Each correct answer = [1] × 10

[10]

10

## 10 Video conferencing

### Advantages

Saves on travel costs from one place to another  
Many different people can contribute to discussions.  
Possible to send files as people speak

### Disadvantages

Can be expensive  
Synchronisation over different time zones can be time consuming  
Q and A sessions may be difficult to manage as numbers increase

Any 1 advantage and 1 disadvantage described =  $2 \times [2]$

[4]

4

11

| Level of response | Marking criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Mark band |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Excellent         | <p>Candidate discusses many features of threats to networks.</p> <p>Their description will show a very good knowledge of the different types of threat available.</p> <p>Their use of spelling punctuation and grammar are excellent and clearly legible.</p> <p>Their discussion of the security necessary to combat the threats shows a very good knowledge of how threats can be prevented.</p> <p>Their discussion uses an excellent form and style.</p> <p>Their discussion is highly coherent and is very well organized and they use a wide range of correct specialist terms</p> | [9–12]    |
| Good              | <p>Candidate describes some features of threats to networks.</p> <p>Their description will show a good knowledge of the different types of threat available.</p> <p>Their use of spelling punctuation and grammar are satisfactory and legible.</p> <p>Their discussion of the security necessary to combat the threats shows a good knowledge of how threats can be prevented.</p> <p>Their discussion uses a satisfactory form and style.</p> <p>The discussion is coherent and is organized and they use a range of correct specialist terms.</p>                                     | [5–8]     |
| Poor              | <p>Candidate may discuss few of the features of threats to networks.</p> <p>Their discussion of threats to networks is not organized and uses a poor form and style.</p> <p>Their use of spelling punctuation and grammar are poor and their work is not that legible.</p> <p>The discussion is coherent and may use few (if any) correct specialist terms.</p>                                                                                                                                                                                                                          | [1–4]     |

If there is not sufficient value in the answer a mark of zero will be awarded.  
The discussion should include some or all of the following sections.

- Viruses
- Trojan horses
- Worms
- How to combat them using software
- The role of firewalls
- DoS attacks – prevention.
- Physical security measures

[12]

12

- 12 (a) Domain name resolution
- The (unique) text name of the webpage requested corresponding to the numeric IP address
- (b) IP addressing
- Mention of static or dynamic IP addressing
- (c) MAC addressing
- The (permanent) address of the network card. ARP will map this layer 2 address to layer 3 IP
- (d) Firewall
- Used to prevent unauthorised access
- 4 × [2]

[8]

8

**Total**

**100**