edexcel
advancing learning, changing lives

GCE

Sample Assessment Materials

Edexcel Advanced Subsidiary GCE in Applied Information and Communication Technology (ICT) (Single Award: 8751)/(Double Award: 8752)

Edexcel Advanced GCE in Applied Information and Communication Technology (ICT) (Single Award: 9751)/(Double Award: 9752)

Edexcel Advanced GCE with Advanced Subsidiary (Additional) in Applied Information and Communication Technology (ICT) (9753)

First assessment June 2010

A PEARSON COMPANY

Edexcel, a Pearson company, is the UK's largest awarding body, offering academic and vocational qualifications and testing to more than 25,000 schools, colleges, employers and other places of learning in the UK and in over 100 countries worldwide. Qualifications include GCSE, AS and A Level, NVQ and our BTEC suite of vocational qualifications from entry level to BTEC Higher National Diplomas, recognised by employers and higher education institutions worldwide.

We deliver 9.4 million exam scripts each year, with more than 90% of exam papers marked onscreen annually. As part of Pearson, Edexcel continues to invest in cutting-edge technology that has revolutionised the examinations and assessment system. This includes the ability to provide detailed performance data to teachers and students which helps to raise attainment.

Authorised by Roger Beard
Prepared by Phil Myers

Publications code UA021770

Contents

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

  i) ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear

  ii) select and use a form and style of writing appropriate to purpose and to complex subject matter

  iii) organise information clearly and coherently, using specialist vocabulary when appropriate.

Write your name here

Surname	Other names

Edexcel GCE

Centre Number	Candidate Number

Applied Information and Communication Technology

Unit 3: The Knowledge Worker

COVER SHEET

Sample Assessment Material	Paper Reference **6953/01**

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Punch a hole in the top left corner of each printout.
- Ensure your printouts are in the correct order and attach them to Page 2 of this cover sheet using a treasury tag.

Turn over ▶

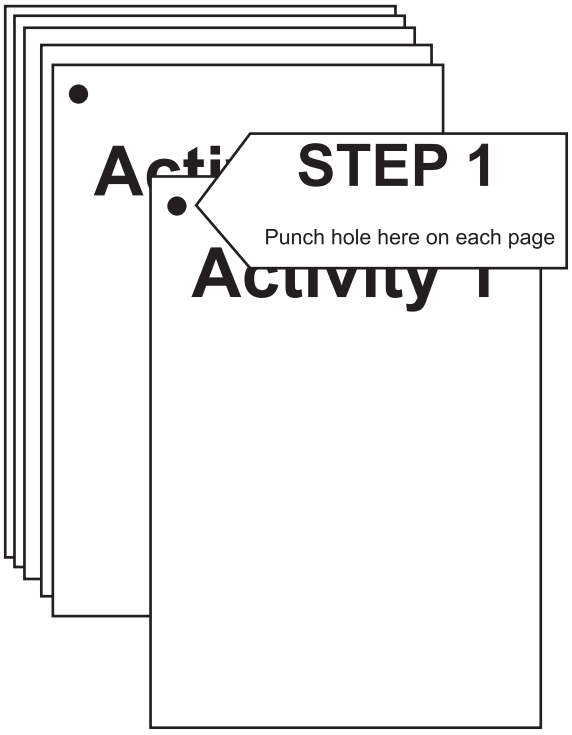
N37321A

2/2

N 3 7 3 2 1 A 0 1 0 4

edexcel
advancing learning, changing lives

Put 'treasury tag' through this hole



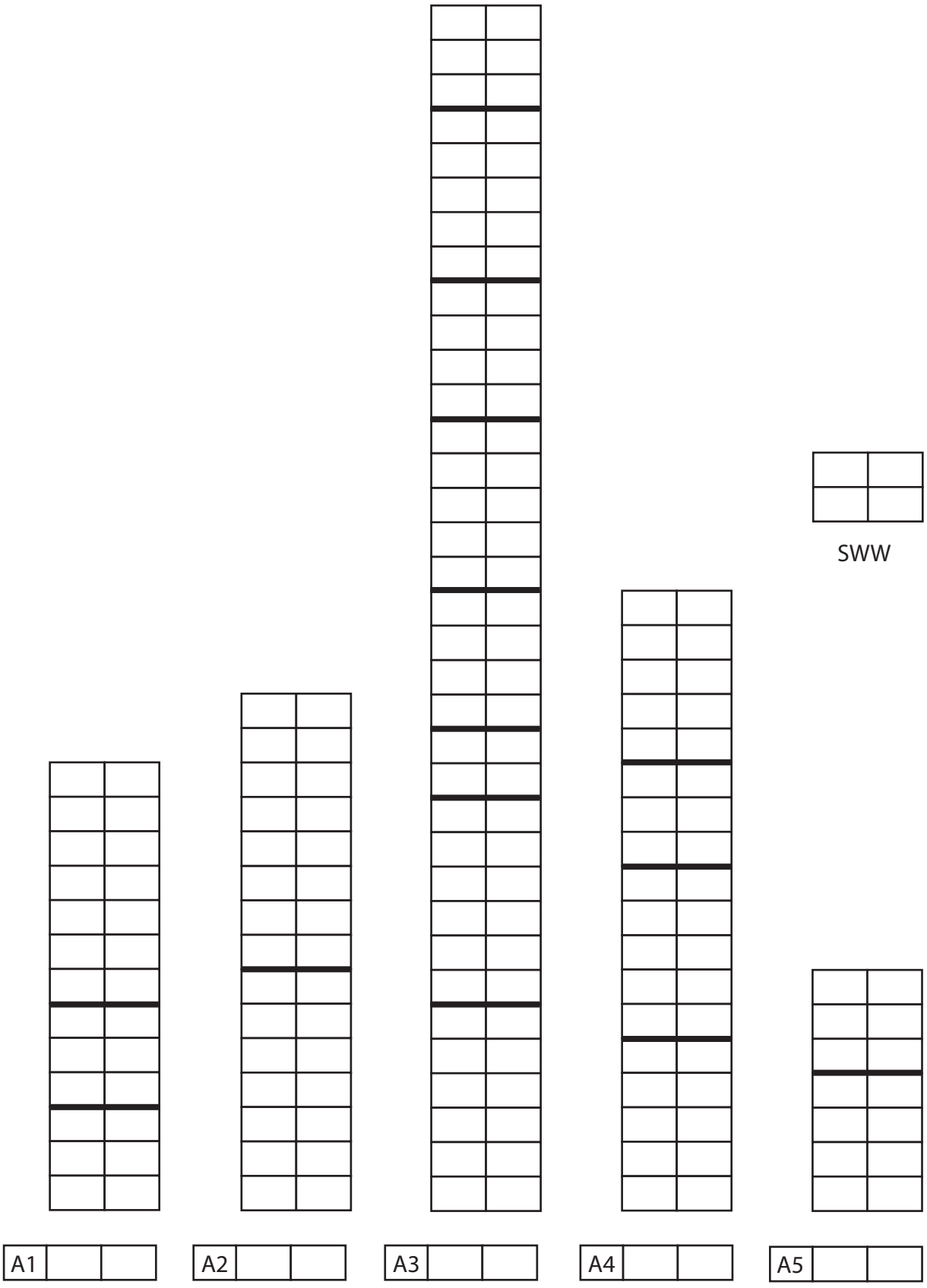
STEP 2 **Arrange your pages in this order, face up.**

Activity 1
Activity 2
Activity 3
Activity 4
Activity 5

STEP 3 Put a 'treasury tag' through all your pages

STEP 4 (last)

FOR EXAMINER'S USE ONLY



BLANK PAGE

Edexcel GCE

Applied Information and Communication Technology

Unit 3: The Knowledge Worker

Sample Assessment Material

Scenario

Paper Reference
6953/01

The scenario should be distributed to candidates at least three working weeks before the examination.
Practice files: GBBC_practice.xls, Sales Data_practice.txt

This scenario should be used for the purposes of preparing candidates for the examination. This copy **must not** be taken into the examination. The information contained in the scenario will be included in the examination paper.

Further details are in the Instructions of the Conduct of Examinations (ICE), available from the Edexcel website for this qualification.

Edexcel will not accept any request for special consideration should candidates be given the incorrect scenario for the examination they are sitting.

Turn over ▶

N37320A

2/2

N 3 7 3 2 0 A

edexcel
advancing learning, changing lives

The Green Bay Building Company

The Green Bay Building Company was founded by David Green in 2003.

David trained as an architect and has been designing houses since 1985. Over time, David has become concerned about global warming and has introduced into his house designs aspects to minimise the carbon footprint of the occupiers. Unfortunately these modifications tend to make the houses more expensive to produce. The building firm that David worked for at the time did not like the modifications as it meant less profit. As a result, David was instructed to remove them from his designs. Unable to find a building company to take on his revolutionary designs, David decided the only way he was going to get his designs accepted was if he formed his own building company. Consequently the Green Bay Building Company was formed. Since its inception the Green Bay Building Company has created many successful developments. David has found that some people will pay extra if they think the house is eco-friendly and would pay even more if they thought there would be a fuel saving.

The Green Bay Building Company has recently acquired 100,000m2 of brown-field building land in Tewkesbury and David plans to build an eco-friendly housing estate there. David has set the target that the whole estate should have a predicted maximum carbon footprint of 1000 tonnes per year. Being a businessman he needs to make a profit. To help achieve this he has set a development cost limit of £95,000,000. In order to get planning permission Green Bay Building Company has had to agree that no more than 200 of a particular housing type would be built. Currently the Green Bay Building Company has five different housing types. The table shows the housing type, how much each costs to build and the minimum area of land required.

HousingType	BuildCost	RequiredArea
1BedroomFlat	£100,000.00	130m2
2BedroomTerrace	£167,000.00	150m2
3BedroomSemiDetached	£200,000.00	200m2
4BedroomDetached	£230,000.00	300m2
5BedroomDetached	£280,000.00	375m2

All the buildings are made from materials manufactured by processes designed to minimise carbon emissions. Additionally there are extra features which could be used to reduce the fuel costs and thereby reduce the carbon footprint.

The features and their costs are in this table.

Features	**Costs**
Solar Panels	£500.00
Wind Turbines	£6,000.00
Cavity Wall Insulation	£6,000.00
Loft Insulation	£6,000.00
Double Glazing	£6,000.00

Your Role

You have been employed as an Information Technology expert by the Green Bay Building Company. You have been given a partially completed model which your predecessor created to help advise the Green Bay Building Company about various aspects of the development.

Description of the model

The partially completed model allows you to try different combinations of housing types in the estate and also allows you to add fuel saving features.

Worksheet Description

Calculation Page	The 'Calculation Page' worksheet is the summary page where you will be adjusting the numbers of each house type in the development and also assigning the fuel saving features to the particular housing type. The area covered by your development, its carbon footprint, its initial cost and the profit you will make will be displayed on this page. The margin column can be set to give a profit of up to 9% on individual house types.
House Types	The 'House Types' worksheet will contain basic details about each housing type. These details include the average carbon footprint and the average area taken up by each housing type.
House Costs	The costs of building the development will be calculated from initial costs stored in this worksheet.
Fuel Bills	This worksheet will calculate the average fuel bills for each housing type. It will take into account whatever fuel saving aspects you have included.
Costs	This worksheet will contain the costs of the various fuel saving features and will be used to calculate the average fuel bills.
Sales Data	This worksheet will contain data about the number of each housing type that would be sold at different prices.

Some cells in the model are password protected. Should you wish to experiment with the model,the password is *edexcel*. Be aware that if you change the contents of any protected cell the model may not work.

BLANK PAGE

Edexcel GCE

Applied Information and Communication Technology

Unit 3: The Knowledge Worker

Sample Assessment Material

Time: 2 hour 30 minutes

Paper Reference
6953/01

You must have:
Short treasury tag, GBBC_exam.xls, Sales Data_exam.txt, Cover sheet

Instructions

- Complete your candidate details on the cover sheet provided.
- All tasks must contain your name, candidate number, centre number and activity number.
- At the end of the examination:
  – *All printouts should be placed in the correct order.*
  – *Use a treasury tag to attach your printouts **(as shown)** to Page 2 of the cover sheet.*

Information

- The total mark for this paper is **90**.
- There are **five** activities in this examination totalling 88 marks. 2 further marks are allocated to Standard Ways of Working.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read through the Scenario carefully.
- Work through the activities in order.
- Attempt **ALL** activities.
- Label your printouts clearly as instructed.
- Printing must be undertaken within the examination time.

Turn over ▶

N37321A

2/2

N 3 7 3 2 1 A

edexcel
advancing learning, changing lives

The Green Bay Building Company

The Green Bay Building Company was founded by David Green in 2003.

David trained as an architect and has been designing houses since 1985. Over time, David has become concerned about global warming and has introduced into his house designs aspects to minimise the carbon footprint of the occupiers. Unfortunately these modifications tend to make the houses more expensive to produce. The building firm that David worked for at the time did not like the modifications as it meant less profit. As a result, David was instructed to remove them from his designs. Unable to find a building company to take on his revolutionary designs, David decided the only way he was going to get his designs accepted was if he formed his own building company. Consequently the Green Bay Building Company was formed. Since its inception the Green Bay Building Company has created many successful developments. David has found that some people will pay extra if they think the house is eco-friendly and would pay even more if they thought there would be a fuel saving.

The Green Bay Building Company has recently acquired 100,000m2 of brown-field building land in Tewkesbury and David plans to build an eco-friendly housing estate there. David has set the target that the whole estate should have a predicted maximum carbon footprint of 1000 tonnes per year. Being a businessman he needs to make a profit. To help achieve this he has set a development cost limit of £95,000,000. In order to get planning permission Green Bay Building Company has had to agree that no more than 200 of a particular housing type would be built. Currently the Green Bay Building Company has five different housing types. The table shows the housing type, how much each costs to build and the minimum area of land required.

HousingType	BuildCost	RequiredArea
1BedroomFlat	£100,000.00	130m2
2BedroomTerrace	£167,000.00	150m2
3BedroomSemiDetached	£200,000.00	200m2
4BedroomDetached	£230,000.00	300m2
5BedroomDetached	£280,000.00	375m2

All the buildings are made from materials manufactured by processes designed to minimise carbon emissions. Additionally there are extra features which could be used to reduce the fuel costs and thereby reduce the carbon footprint.

The features and their costs are in this table.

Features	**Costs**
Solar Panels	£500.00
Wind Turbines	£6,000.00
Cavity Wall Insulation	£6,000.00
Loft Insulation	£6,000.00
Double Glazing	£6,000.00

Your Role

You have been employed as an Information Technology expert by the Green Bay Building Company. You have been given a partially completed model which your predecessor created to help advise the Green Bay Building Company about various aspects of the development.

Description of the model

The partially completed model allows you to try different combinations of housing types in the estate and also allows you to add fuel saving features.

Worksheet Description

Calculation Page	The 'Calculation Page' worksheet is the summary page where you will be adjusting the numbers of each house type in the development and also assigning the fuel saving features to the particular housing type. The area covered by your development, its carbon footprint, its initial cost and the profit you will make will be displayed on this page. The margin column can be set to give a profit of up to 9% on individual house types.
House Types	The 'House Types' worksheet will contain basic details about each housing type. These details include the average carbon footprint and the average area taken up by each housing type.
House Costs	The costs of building the development will be calculated from initial costs stored in this worksheet.
Fuel Bills	This worksheet will calculate the average fuel bills for each housing type. It will take into account whatever fuel saving aspects you have included.
Costs	This worksheet will contain the costs of the various fuel saving features and will be used to calculate the average fuel bills.
Sales Data	This worksheet will contain data about the number of each housing type that would be sold at different prices.

Some cells in the model are password protected. Should you wish to experiment with the model,the password is *edexcel*. Be aware that if you change the contents of any protected cell the model may not work.

The Task

You have been asked to recommend how many of each housing type the Green Bay Building Company should build in the Tewkesbury development. You need to recommend which fuel saving features should be included with each housing type and the profit margin for each. Any feature you add will increase the cost of the buildings but will reduce the fuel bills and the carbon footprint. You can assign up to five solar panels to a particular housing type but only one of each of the other features.

You must ensure that any constraints listed in the scenario are adhered to in your final solution. David will expect you to balance the amount of profit against the use of fuel saving features. You will then present your findings to the board of the Green Bay Building Company.

Sales Data

For the model to work you will need to provide figures which will predict how many of each housing type you would sell at a given price. The higher the price the fewer buildings you will be able to sell. Sales figures have been calculated from a survey conducted in three similar developments previously built by the Green Bay Building Company. The three developments are in Slough, Ipswich and Birmingham. Two hundred owners of each housing type were asked the question "What is the maximum amount you would pay for your house today?" The results have been collated by your assistant and are contained in the text file "**Sales Data_exam.txt".**

What you have to do

Read the remainder of the paper and then undertake the tasks in order. Each task has an estimated time limit. This is a guide only but may help you plan your work.

Instructions to Candidates

All printouts **must** have a header and a footer. The header must contain the activity number. The footer must contain your name, candidate number and centre number.

Minimum font size of 10 should be used throughout.
All spreadsheet printouts should show gridlines and row and column headers.
For some of your spreadsheet printouts you may need to adjust column widths. To do this you will need to unprotect the worksheets. The password is *edexcel*.

Activity 1 – Understanding the situation (suggested time 15 minutes)

You should look at all the information available and make sure that you understand the situation.

On **one** sheet of A4:

(a) Summarise the current situation

(7)

(b) State the decisions you have to make

(3)

(c) State any assumptions, which affect the model, you are making.

(3)

Save and print your work.

(Total for Activity 1 = 13 marks)

Activity 2 – Sources of information (suggested time 15 minutes)

On **one** sheet of A4:

(a) Analyse the source of sales data with regard to accuracy and the likelihood of providing a good prediction of the sales of each particular housing type.

(8)

(b) There are several factors that have not been taken into account in the compilation of the sales data. List these factors.

(7)

Save and print your work.

(Total for Activity 1 = 15 marks)

Activity 3 – Computer modelling (suggested time 50 minutes)

Open the spreadsheet model and familiarise yourself with it.

The model is stored as **GBBC_exam.xls**.

(a) **Importing Data**

- ❑ Insert a new worksheet and import the survey data into it (Sales Data_exam.txt)
- ❑ On **one** sheet of A4, print off this worksheet showing the data. Remember to show gridlines and row and column headers.

(3)

(b) **Sales Data**

- ❑ Using the data in your newly created worksheet, transfer the data into cells A2:F43 of the 'Sales Data' worksheet
- ❑ On **one** sheet of A4, print off columns A to F, rows 2 to 43 of the 'Sales Data' worksheet showing **formulae**.

(5)

(c) **Costs**

- ❑ Enter suitable values into Cells B2 to B6 of the 'Costs' worksheet
- ❑ On **one** sheet of A4, print off columns A to B, rows 2 to 6 only of the 'Costs' worksheet showing **data**.

(4)

(d) **House Costs**

- ❑ In cell I8 of the 'House Costs' worksheet enter a suitable formula to calculate the total development cost
- ❑ In cell J8 of the 'House Costs' worksheet enter a suitable formula to calculate the total development revenue
- ❑ On **one** sheet of A4, print row 8, columns F to J only, of the 'House Costs' worksheet showing **formulae**.

(5)

(e) **House Types**

- ❑ In cell D8 of the 'House Types' worksheet enter a suitable formula to calculate the total area used in the development
- ❑ In cell F8 of the 'House Types' worksheet enter a suitable formula to calculate the carbon footprint of the development, excluding fuel savings
- ❑ In cell H8 of the 'House Types' worksheet enter a suitable formula to calculate the carbon footprint of the development, including fuel savings
- ❑ On **one** sheet of A4, print rows 2 to 8, columns D to H only of the 'House Types' worksheet showing **formulae**.

(5)

(f) **Calculation Page**

- ❑ In cell B11 of the 'Calculation Page' worksheet enter a suitable formula to transfer the total development revenue from the 'House Costs' worksheet
- ❑ In cell B12 of the 'Calculation Page' worksheet enter a suitable formula to transfer the total development costs from the 'House Costs' worksheet
- ❑ In cell B13 of the 'Calculation Page' worksheet enter a suitable formula to calculate the profit made
- ❑ On **one** sheet of A4, print rows 9 to 13, columns A to B only of the 'Calculation Page' worksheet showing **formulae**.

(4)

(g) **The solution**

- ❑ Use the spreadsheet model to try to find the best combinations of housing types within the development. Try to find a solution which meets all the constraints including showing a profit.

With your proposed solution displayed:

- ❑ On **one** sheet of A4, print off the 'Calculation Page' worksheet showing data.

(9)

Save and print your work.

(Total for Activity 3 = 35 marks)

Activity 4 – Recommendations (suggested time 20 minutes)

Write a report, on one page of A4, for David Green of the Green Bay Building Company, recommending your proposed solution. Your report must be fit for purpose.

Your report should include:

(a) your recommendations

(3)

(b) an explanation of **WHY** you made these recommendations

(2)

(c) any other factors that David may need to take into account that might affect the building and sales of the houses.

(3)

The quality of your report will assessed on:

- your use of graphical information as well as textual information

(5)

- its suitability for the intended audience.

(3)

Save and print your work.

(Total for Activity 4 = 16 marks)

***Activity 5 – Evaluation (suggested time 10 minutes)**

Write an evaluation, on one page of A4, considering:

- how well the spreadsheet model performed in helping you reach a solution.
- what else you would like it to do, why this would help and how you would achieve it.

Save and print your work.

(Total for Activity 5 = 9 marks)

Standard ways of working.

All printouts must contain the activity number, your name, candidate number, and centre number.
Pages must be securely fastened to the cover sheet and in the correct order.
A minimum font size of 10 should be used for all word processed documents.

(Standard ways of working = 2 Marks)

TOTAL FOR PAPER = 90 MARKS

BLANK PAGE

BLANK PAGE

BLANK PAGE

Sample Mark Scheme

Unit 3: The Knowledge Worker

Activity 1 — Understanding the situation

Question Number	Answer	Mark
1(a)	Any 7 points from: **A1** Working as IT Specialist for GBBC **A2** Build Houses **A3** Fuel Saving Devices **A4** Tewkesbury Development **A5** Carbon Footprint max 1000 tonnes per year **A6** Maximum 200 each type **A7** 5 types (named OK) **A8** Max Cost of development £95,000,000 **A9** Area of development 100000m^2 **A10** Survey of other developments for sales data **A11** Survey from three other developments **A12** 200 house owners surveyed for EACH development **A13** Max 5 solar panels **A14** Need to make a profit 1 mark for each (7 x 1)	**(7)**

Question Number	Answer	Mark
1(b)	For example: **B1** Number of each house type **B2** Profit margin **B3** What fuel saving feature 1 mark for each (3 x 1)	**(3)**

Question Number	Answer	Mark
1(c)	Any 3 assumptions from: **C1** Costs of raw materials same **C2** Carbon footprint data accurate **C3** Costs of fuel saving aspects accurate **C4** Housing needed in Tewkesbury area **C5** Demography **C6** Type of housing appropriate for Tewkesbury **C7** Anything sensible (just 1) 1 mark for each (3 x 1)	**(3)**

Activity 2 — Sources of information

Question Number	Answer	Mark
2(a)	For example: **A1** Survey of other sites **A2** Three different areas **A3** Similar or identical housing **A4** People concerned would be in the market for that type of house (Currently own) **A5** Average is not reliable **A6** Sales patterns can change **A7** Size of sample same as maximum **A8** Comment on likely accuracy of prediction 1 mark for each (8 x 1)	**(8)**

Question Number	Answer	Mark
2(b)	Any 7 factors from: **B1** Different House prices in different areas **B2** May be slight changes in design **B3** Not as nice an area as others (or vice versa) **B4** Proportion of each house type may be different making estate more or less desirable **B5** Employment in the area **B6** Public Transport **B7** Roads **B8** Public facilities (Parks) **B9** Fuel Bills **B10** Nearness to shops **B11** Any other valid factor 1 mark for each (7 x 1)	**(7)**

Activity 3 — Computer modeling

Question Number	Answer	Mark
3(a)	**Importing Data** **A1** New worksheet created (1) **A2** Data imported correctly (1) **A3** Printout exists and complies with standard ways of working (1)	**(3)**

Question Number	Answer	Mark
3(b)	**Sales Data** **B1** A3 contains formula which transfers data from new worksheet (1) **B2** Formula replicated correctly across (1) **B3** Formula replicated correctly down (1) **B4** Correct columns printed (1) **B5** Printout conforms to standard ways of working (1)	**(5)**

Question Number	Answer	Mark
3(c)	**Costs** **C1** Value for Solar panel £500 (1) **C2** Value for others £6000 (1) **C3** Correct rows and columns printed (1) **C4** Printout conforms to standard ways of working (1)	**(4)**

Question Number	Answer	Mark
3(d)	**House Costs** **D1** Working Formula in I8 (=Sum(I3:I7) (1) **D2** Working Formula in J8 (=Sum(J3:J7) (1) **D3** Sum function used (1) **D4** Correct rows and columns printed (1) **D5** Printout conforms to standard ways of working (1)	**(5)**

Question Number	Answer	Mark
3(e)	**House Types** **E1** Working Formula in D8 (=Sum(D3:D7) (1) **E2** Working Formula in F8 (=Sum(F3:F7) (1) **E3** Working Formula in H8 (=Sum(H3:H7) (1) **E4** Sum Function Used (1) **E5** Correct rows and columns printed. Printout conforms to standard ways of working (1)	**(5)**

Question Number	Answer	Mark
3(f)	**Calculation Page (Formulae)** **F1** Correct formula in B11 (='House Costs'!J8) (1) **F2** Correct formula in B12 (='House Costs'!K8) (1) **F3** Correct formula in B13 (=B11-B12) (1) **F4** Correct rows and columns printed. Printout conforms to standard ways of working (1)	**(4)**

Question Number	Answer	Mark
3(g)	**The Solution** **G1** Development Area < 10000 m^2 (1) **G2** Development Area between 99000 and 100000 (1) **G3** Carbon Footprint < 1000 (1) **G4** Carbon Footprint <900 (1) **G5** Profit made (1) **G6** Profit > £100000 (1) **G7** Profit >£300000 (1) **G8** All aspects used at least once (1) **G9** Correct rows and columns printed with suitable data. Printout conforms to standard ways of working (1)	**(9)**

Activity 4 — Recommendations

Question Number	Answer	Mark
4(a)	3 recommendations, eg: **A1** Chosen number for each house stated **A2** Fuel saving devices stated **A3** Margin for each type stated **A4** Any other valid reason why. 1 mark for each (3 x 1)	**(3)**

Question Number	Answer	Mark
4(b)	2 reasons why, eg: **B1** Reasons for choice given (reasonable profit with reasonable fuel savings) **B2** Profit and Carbon footprint linked **B3** Any other valid reason why. 1 mark for each (2 x 1)	**(2)**

Question Number	Answer	Mark
4(c)	Any 3 other factors from: **C1** Low fuel bills may mean more would be sold **C2** Green promotion may affect how much someone would pay **C3** Materials (e.g. might be cheaper elsewhere) **C4** Build amenities **C5** Play areas for kids **C6** Any other relevant factor 1 mark for each (3 x 1)	**(3)**

Question Number	Answer	Mark
4(d) Report Quality	**Graphical Representations of Data** **D1** Graph included (1) **D2** Graph fit for purpose (1) **D3** Graph show information relevant to report (1) **D4** **Either** Accompanying text partially explains Graph (1) **D5** **Or** Accompanying text fully explains graph (2)	**(5)**

Question Number	Answer	Mark
4(e) Report Quality	**Suitability for Audience** **E1** Language suitable for audience (1) **E2** Professional report layout (Intro, Conc, date, at least 2 other sections, suit font colour & size, suitable use of tools) (1) **Plus any 1 of** **E3** Concluding Statement **E4** Headings consistent **E5** Suitable report title (Who it is to, what it is about and the report) **E6** Charts labelled (Title, Both axes, units both axes) ((2 x 1) + 1)	**(3)**

Activity 5 — Evaluation

Question Number	Indicative content	
5 **QWC (i-iii)**	**Comment on ease of use of model —** eg Most of the formulae were already provided. I just had to enter a few simple formulae. The conditional formatting helped me see where I was making a mistake. It was easy to use because all of the data were on separate pages. **Statement to the effect that it has helped provide a solution** — eg As soon as I entered some data the spreadsheet immediately updated and allowed me to experiment with different solutions to find a best solution. **Comment on accuracy of any data** — eg the data was fairly accurate because it was from a similar type of building site but it could have been out of date because no date was given. Some of the data about the carbon savings (for example) may not have been accurate because I could have contacted alternative suppliers. There was no way of checking the data. **Recommendations for improvement** — It would be useful if there was a graph page so that the impact of changes could be seen more clearly. It would have been useful to have had a split screen so that I could see the changes on two worksheets at the same time. It would have been useful to have data from real customers, from alternative suppliers. Further breakdown costs eg labour costs to make a better model. Anomalies in flats – solar panels, loft insulations.	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-3	The account is descriptive rather than an evaluation. The candidate makes general comments about the ease of use of the model Any discussion is in general terms rather than specific. Recommendations for improvement are without explanations. The candidate uses everyday language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar are used with limited accuracy.
Level 2	4-6	The account includes some evaluation. The candidate makes useful comments on the ease of use of the model Recommendations for improvement are included with some explanation. The candidate uses some specialist terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar are used with some accuracy.
Level 3	7–9	The account is evaluative. The candidate comments on the ease of use of the model and identifies why this is the case. The candidate comments on the ease of use of the data. Recommendations for improvement are included with explanation of the data and source. The candidate uses a range of appropriate specialist terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.

SWW	Answer	Mark
SWW	Authenticating Work (All WP pages have task number, Name, centre number)	**(1)**
	Appropriate Structure (Pages in correct order and folder assembled correctly)	**(1)**

Write your name here

Surname	Other names

Edexcel GCE

Centre Number	Candidate Number

Applied Information and Communication Technology

Unit 7: Using Database Software

Sample Assessment Material

COVER SHEET

Paper Reference

6957/01

Instructions

- Use black ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Punch a hole in the top left corner of each printout.
- Ensure your printouts are in the correct order and attach them to Page 2 of this cover sheet using a treasury tag.

Turn over ▶

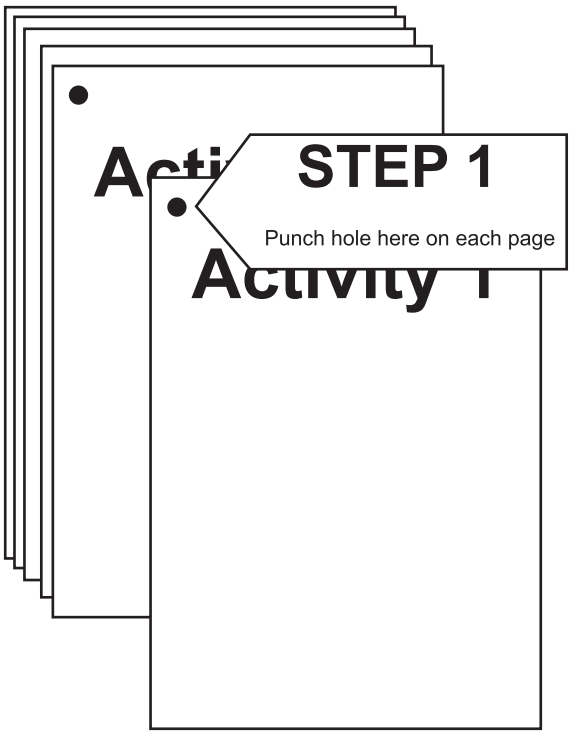
N37319A

2/2/

N 3 7 3 1 9 A 0 1 0 4

edexcel
advancing learning, changing lives

Put 'treasury tag' through this hole



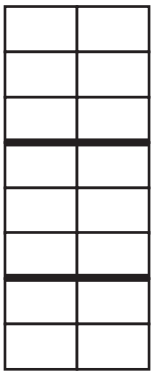
STEP 2 **Arrange your pages in this order, face up.**

Activity 1
Activity 2
Activity 3
Activity 4
Activity 5

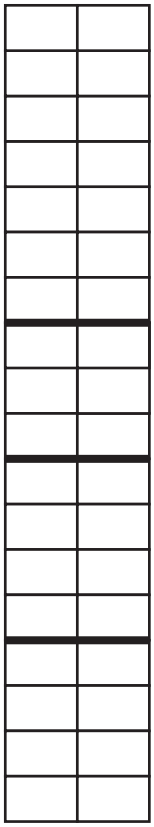
STEP 3 Put a 'treasury tag' through all your pages

STEP 4 (last)

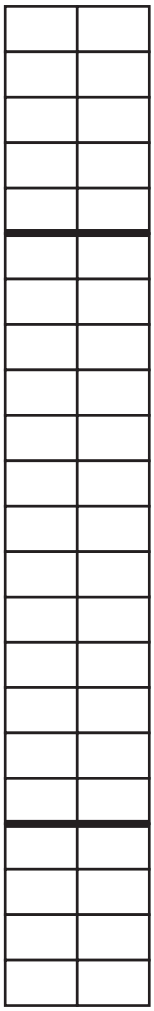
FOR EXAMINER'S USE ONLY



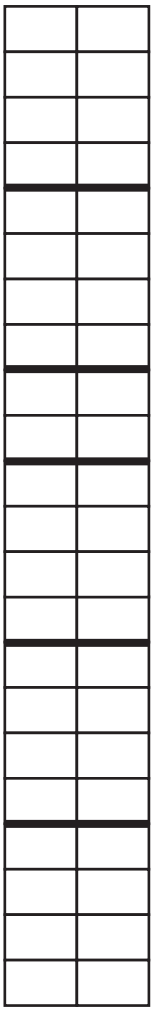
A1



A2



A3



SWW

A4

A5

BLANK PAGE

Edexcel GCE

Applied Information and Communication Technology

Unit 7: Using Database Software

Sample Assessment Material

Scenario

Paper Reference
6957/01

The scenario should be distributed to candidates at least three working weeks before the examination.
Note: There are **no** practice files for this examination.

This scenario should be used for the purposes of preparing candidates for the examination. This copy **must not** be taken into the examination. The information contained in the scenario will be included in the examination paper.

Further details are in the Instructions of the Conduct of Examinations (ICE), available from the Edexcel website for this qualification.

Edexcel will not accept any request for special consideration should candidates be given the incorrect scenario for the examination they are sitting.

Turn over ▶

N37318A

2/2/

N 3 7 3 1 8 A

edexcel
advancing learning, changing lives

The Green Bay Building Company

The Green Bay Building Company was founded by David Green in 2003.

Since then the company has created many successful developments.

The Green Bay Building Company has recently built a housing development in Tewkesbury and is about to auction the houses.

The Auction

The auction will be taking place from May to July 2008. Prospective bidders will apply to the Green Bay Building Company for a userID and password. They may make a bid at any time between the start of the auction and the day the auction is closed.

The development has 57 plots with eight different types of house and the number of each housing type within the development varies. As all the plots are more or less the same size the bidders will bid for the housing type rather than a specific plot. When the auction is closed the Auction Manager will allocate the plots to the highest bidders for that housing type. For example, if there are 10 three bedroom semi-detached houses, the top ten bidders for that housing type will be allocated a plot. Notification will be sent to successful bidders detailing the plot number they have been allocated.

Once bidders have received their userIDs they should be able to sign on to the bidding system. If they supply a correct userID and password they will be taken to the bidding screen. They can then choose which housing type they require. The userID and the bid value of those bids which are currently successful are displayed. For example, if there are eight plots containing a particular housing type then the top eight bids for these are displayed. Bidders can then submit their own bid. If their bid is lower than the lowest successful bid so far then a message is displayed stating that their bid was unsuccessful. If it is higher than the lowest successful bid so far then their bid is accepted. The list of successful bids is then refreshed to display the new list. Apart from the successful bids, bidders should not be able to see any details of other bidders.

The proposed system

You need to create a new database which will hold the data required to undertake the auction and will allocate the plots to the successful bidders. You are supplied with some computer generated test data to test out your system.

Edexcel GCE

Applied Information and Communication Technology

Unit 7: Using Database Software

Sample Assessment Material

Assessment Window: 3 weeks
Time: 10 hours

Paper Reference
6957/01

You must have:
Short treasury tag, BidDetails_exam.txt, PlotDetails_exam.txt
Logo_exam.jpg, Cover sheet

Instructions

- Complete your candidate details on the cover sheet provided.
- All tasks must contain your name, candidate number, centre number and activity number.
- At the end of the examination:
  – *All printouts should be placed in the correct order.*
  – *Use a treasury tag to attach your printouts **(as shown)** to Page 2 of the cover sheet.*

Information

- The total mark for this paper is **90**. There are **five** activities in this examination totalling 88 marks. 2 further marks are allocated to Standard Ways of Working.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Use relational database software to carry out the database activities in this examination.
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read through the Scenario carefully.
- Work through the activities in order.
- Attempt **ALL** activities.
- Label your printouts clearly as instructed.
- Printing must be undertaken within the examination time.

Turn over ▶

N37319A

2/2/

N 3 7 3 1 9 A

edexcel
advancing learning, changing lives

The Green Bay Building Company

The Green Bay Building Company was founded by David Green in 2003.

Since then the company has created many successful developments.

The Green Bay Building Company has recently built a housing development in Tewkesbury and is about to auction the houses.

The Auction

The auction will be taking place from May to July 2008. Prospective bidders will apply to the Green Bay Building Company for a userID and password. They may make a bid at any time between the start of the auction and the day the auction is closed.

The development has 57 plots with eight different types of house and the number of each housing type within the development varies. As all the plots are more or less the same size the bidders will bid for the housing type rather than a specific plot. When the auction is closed the Auction Manager will allocate the plots to the highest bidders for that housing type. For example, if there are 10 three bedroom semi-detached houses, the top ten bidders for that housing type will be allocated a plot. Notification will be sent to successful bidders detailing the plot number they have been allocated.

Once bidders have received their userIDs they should be able to sign on to the bidding system. If they supply a correct userID and password they will be taken to the bidding screen. They can then choose which housing type they require. The userID and the bid value of those bids which are currently successful are displayed. For example, if there are eight plots containing a particular housing type then the top eight bids for these are displayed. Bidders can then submit their own bid. If their bid is lower than the lowest successful bid so far then a message is displayed stating that their bid was unsuccessful. If it is higher than the lowest successful bid so far then their bid is accepted. The list of successful bids is then refreshed to display the new list. Apart from the successful bids, bidders should not be able to see any details of other bidders.

The proposed system

You need to create a new database which will hold the data required to undertake the auction and will allocate the plots to the successful bidders. You are supplied with some computer generated test data to test out your system.

Instructions to Candidates

All documents **must** have a header and a footer. The header must contain the activity number. The footer must contain your name, candidate number and centre number.

Minimum font size of 10 should be used throughout.

Screen prints should be large enough to be easily read.

All database reports must have the activity number, your name, candidate number and centre number in the page header.

Activity 1 – Understanding the problem (suggested time 1 hour)

Write notes describing the requirements of the auction system in terms of:

(a) the processes the system needs to undertake

(3)

(b) the inputs to each process

(3)

(c) the outputs from each process.

(2)

Evidence to be submitted for (a), (b) and (c)

❑ One side of A4 containing word processed notes on the proposed system.

(Total for Activity 1 = 8 marks)

Activity 2 – Structure (suggested time 2 hours)

(a) Use data modelling techniques to design an efficient database structure that minimises duplication of data

(7)

(b) Create the database structure

(3)

(c) Use a range of validation checks and input masks to ensure correct input of data

(4)

(d) Load the data from the text files into your database.

(4)

Evidence to be submitted for (a), (b), (c) and (d)

- ❑ A screen print showing the relationships in your database
- ❑ A screen print showing each table structure with data types
- ❑ Evidence of any validation checks applied
- ❑ Screen prints of the tables after import, showing **the number of records** and at least five records. (If the number of fields is too big to fit on one page, all the fields do not have to be displayed.)

(Total for Activity 2 = 18 marks)

Activity 3 – Making a bid (suggested time 3 hours and 30 minutes)

(a) An interface is an important part of the system you are developing.

❑ On one side of A4

(i) Define the term interface.

(1)

(ii) Explain how an interface will help the operation of the database.

(4)

(b) A sign-on screen is required for the bidding system.

(i) Create the sign-on screen and screenprint the form in **DESIGN** view

(1)

(ii) Annotate the screen print to explain the labels fields

(4)

(iii) Screenprint the form in **FORM** view

(1)

(iv) Annotate the screen print to explain the HCI .

(3)

(c) Create the bidding screen, screen print the screen in **FORM** view and use annotations to explain it.

(4)

(d) Produce queries to:

- find the successful bidders for each house type
- check that the bid entered is above the current minimum successful bid
- update tables when a bid is successful.

(i) Produce annotated screen prints of the **three** queries in **DESIGN** view describing what each query will do.

(6)

(ii) Produce screen prints of the result of the **three** queries.

(3)

(e) Create and use macros to:

- store new bids
- reject any bids not high enough
- create a message for unsuccessful bids.

(i) Produce annotated screen prints of the macros in **DESIGN** view

(3)

(ii) Produce screen prints of the function of any **two** of the macros e.g. error messages/ updated records.

(2)

(Total for Activity 3 = 32 marks)

Activity 4 – Testing (suggested time 1hour)

You now have to test your database for functionality.

Potential buyers are submitting bids.

Your database needs to show whether a bid has been successful or not.

On one sheet of A4 in each case, produce a screen print showing:

(a) an example of a successful bid

(2)

(b) that the successful bid has been stored in the table

(1)

(c) an example of an unsuccessful bid

(2)

(d) that the unsuccessful bid has been stored in the table

(1)

(e) the list of successful bids.

(1)

(Total for Activity 4 = 7 marks)

Activity 5 – Successful bid report (suggested time 1 hour 30 minutes)

Note: this activity requires you to produce a report. Your name, candidate number and centre number should be in the page header for the report. (You need to modify your report in design view to do this.)

Create a report to list for each house type:

- the names, addresses and telephone numbers of the successful bidders
- the value of each successful bid
- the total value of the successful bids.

Each house type should start on a new page.

The totals should be repeated in the report footer and the report footer should also contain a total of all successful bids.

Evidence to be submitted:

- ❑ The printed output from the report.

(Total for Activity 5 = 11 marks)

***Activity 6 – Evaluation (suggested time 1 hour)**

You need to evaluate the model you have produced.

In a word-processed report explain:

- How the database is fit-for-purpose and the criteria you have used to reach this conclusion.
- How functionality and the HCI of your database might be improved.

(Total for Activity 6 = 12 marks)

Standard ways of working.

All printouts must contain the activity number, your name, candidate number, and centre number.
Pages must be securely fastened to the cover sheet and in the correct order.
A minimum font size of 10 should be used for all word processed documents.

(Standard ways of working = 2 marks)

TOTAL FOR PAPER = 90 MARKS

BLANK PAGE

Sample Mark Scheme

Unit 7: Using Database Software

Activity 1 — Understanding the problem

Question Number	Answer	Mark
1(a)	3 processes, eg: **A1** Sign on /Check UserID and password **A2** Make a bid **A3** Allocate plots 1 mark for each (3 x 1)	**(3)**

Question Number	Answer	Mark
1(b)	3 inputs, eg: **B1** Signon: UserID – Password **B2** Make Bid: UserID, House type, Bid value **B3** Allocate Plots: House type UserID 1 mark for each (3 x 1)	**(3)**

Question Number	Answer	Mark
1(c)	3 outputs, eg: **C1** Make a bid – New and old list of successful bids UserID and bid value **C2** Allocate plots – Plot number Name and contact method (address, email or telephone) of successful bidders **C3** Bid unsuccessful message 1 mark for each (2 x 1)	**(2)**

Activity 2 — Structure

Question Number	Answer	Mark
2(a)	**Structure** **A1** Bidder Customer Table (1) **A2** Plot (1) **A3** Bid (1) **A4** House Type (1) **A5** 1:M Relationship Customer-Bid (1) **A6** 1:M Relationship Plot-House type (1) **A7** 1:M Relationship Bid-House type (1)	**(7)**

Question Number	Answer	Mark
2(b)	**Database structures** **B1** Evidence of correct data types (1) **B2** Evidence of correct primary keys (1) **B3** Viable relationships (Check for relationship Customer to plot – either none or no referential integrity) (1)	**(3)**

Question Number	Answer	Mark
2(c)	**Validation** **C1** Any range check (1) **C2** List check (Table Lookup) (1) **C3** Presence check (1) **C4** Picture/format check (1)	**(4)**

Question Number	Answer	Mark
2(d)	**Load data** **D1** Data Successfully Loaded (Customer - 250) (1) **D2** Data Successfully Loaded (Bid - 809) (1) **D3** Data Successfully Loaded (Plot 57) (1) **D4** Data Successfully Loaded (House type - 8) (1)	**(4)**

Activity 3 — Making a bid

Question Number	Answer	Mark
3(a)(i)	Definition of interface – a means of inputting data into the database (1)	**(1)**

Question Number	Answer		Mark
3(a)(ii)	Any 2 explanations from:		
	Statement	**Justification**	
	Reduce data entry errors	By having controls such as list boxes	
	To minimize entry	Making the system more efficient and accurate	
	An additional layer to the database	This will assist in accurate data entry	
	For second mark in each case, answer must include both statement and justification (2 x(1 + 1))		**(4)**

Question Number	Answer	Mark
3(b)(i)	A screen print of the form in **design** view (1)	**(1)**

Question Number	Answer	Mark
3(b)(ii)	4 annotations, eg: **B1** Logo explained – unbound field imported / copied from a jpeg file (1) **B2** System Intro (Name of System and Company) explained – unbound field entered into a label (1) **B3** User ID & Password explained – these are linked to a query and or macro to ensure the user is allowed to make bids (1) **B4** Confirm and Cancel buttons explained-are linked to macros (1) 1 mark for each (4 x 1)	**(4)**

Question Number	Answer	Mark
3(b)(iii)	A screen print of the form in **form** view (1)	**(1)**

Question Number	Answer	Mark
3(b)(iv)	Any 3 annotations from: **B5** Explain all fields are aligned correctly **B6** Heading on the form so the user knows what the system is and/or where they are in the system **B7** Explain labels are not truncated **B8** Explains no navigation or close buttons (other than confirm or cancel) 1 mark for each (3 x 1)	**(3)**

Question Number	Answer	Mark
3(c)	**Bid Screen*** **C1** Form has a title with customer details displayed (1) **C2** Successful bids displayed in a subform (1) **C3** Evidence that successful bids cannot be changed (1) **C4** New Bid value displayed (1) **Must be explained/annotated to gain the mark*	**(4)**

Question Number	Answer	Mark
3(d)(i)	**Queries*** • **Bid Currently Successful query** **D1** Bid currently successful set to True (1) **D2** Must have Bidders and Design code fields included in query (1) • **If bid above the current minimum successful bid query** **D3** If bid greater than current minimum successful bid and not equal to (1) **D4** Query uses grouping (1) • **If bid above the current minimum successful bid query** **D5** Update query produced to update the lowest Bid Currently Successful to false (1) **D6** Design code taken from Bid form (1) **Must be explained/annotated to gain the mark*	**(6)**

Question Number	Answer	Mark
3(d)(ii)	**Screen prints** **D7** 57 records in the result (1) **D8** Retrieves the higher bid (1) **D9** Lowest Bid Currently Successful is set to false (1)	**(3)**

Question Number	Answer	Mark
3(e)(i)	**Screen prints (design view)** **E1** Design view of macro to store new bids (1) **E2** Design view of macro to reject any bids not high enough (1) **E3** Design view of macro to create a message for unsuccessful bids (1)	**(3)**

Question Number	Answer	Mark
3(e)(ii)	**Screen prints (function)** Any 2 screen prints from: **E4** Bids table screen printed with new bid included (1) **E5** Screen print of the error message for unsuccessful bids (1)	**(2)**

Activity 4 — Testing

Question Number	Answer		Mark
4(a)	**A1** **A2**	Screen print of form with the successful bid entered into the form (1) Message to say the bid is successful or Bid Currently Successful field shows True (1)	**(2)**

Question Number	Answer		Mark
4(b)	**B1**	Screen print of successful bid in the table with the Bid Currently Successful field set to True (1)	**(1)**

Question Number	Answer		Mark
4(c)	**C1** **C2**	Screen print of form with the unsuccessful bid entered into the form (1) Message to say the bid is unsuccessful or Bid Currently Successful field shows False (1)	**(2)**

Question Number	Answer		Mark
4(d)	**D1**	Screen print of unsuccessful bid in the table with the Bid Currently Successful field set to False (1)	**(1)**

Question Number	Answer		Mark
4(e)	**E1**	Screen print includes 57 records including the new successful bid (1)	**(1)**

Activity 5 — Successful bid report

Question Number	Answer	Mark
5	**A1** Report produced for a house type (1) **A2** Report produced for all house types (1) **A3** Reports on separate pages (1) **A4** Correct customer details included (1) **A5** 57 plots used (1) **A6** Total value for each house type included (1) **A7** Total value for all house types included (1) **A8** Totals correct (1) **A9** Footer produced (1) **A10** Footer on separate page (1) **A11** Footer has relevant correct totals (1)	**(11)**

Activity 6 — Evaluation

Question Number	Indicative content
6 **QWC (i-iii)**	**Indicative Content** **Database: fitness-for purpose and the criteria** • the database allows plots to be allocated to 57 successful bidders • validation used to restrict incorrect data entry to forms and tables. • provides short cuts like drop-down lists on forms. • **restricts access to those who have a user name and password** • **macros used so database gives out messages where a bid is successful /unsuccessful** • database allows bids to be cancelled using a macro and command button and allows bidders to make a bid • bidders given details on the lowest successful bid in screen **Functionality and HCI** May have improved: • plots allocation by making them automatic • generation of user names and passwords • backgrounds by creating more organisation form back • command buttons by creating more organisation buttons • toolbars are still accessible to users could be hidden from view • screens by only including essential fields making them less cluttered • software messages by restricting what was on screen • labels and text boxes by making them larger better access for visually impaired • online user instructions/help to aid novice users.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-4	The candidates will make basic comments of what they did and how this got a solution. Some screenshots may be provided as evidence. Comments on possible improvements will be made but unsupported and at a basic level. The candidate uses everyday language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar are used with limited accuracy.
Level 2	5-8	Candidates develop responses further by describing features such as validation, testing. Describes how that helps. Gives subjective, but realistic, comments about improvements but not always well supported. The candidate uses some specialist terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar are used with some accuracy.
Level 3	9-12	Comments on extra test data s/he carried out to test the database to ensure it would accept 'extra' data. Thorough explanation of stages with justification. More in-depth analysis of functional improvements to aid e.g. security, avoidance of rogue data, as well as aesthetic improvements. The candidate uses a range of appropriate specialist terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.

SWW	Answer	Mark
SWW	Administration details on each page	**(1)**
	Required printouts only assembled correctly	**(1)**

Write your name here

Surname	Other names

Edexcel GCE

Centre Number	Candidate Number

Applied Information and Communication Technology

Unit 9: Communication and Networks

Sample Assessment Material **COVER SHEET**

Paper Reference
6959/01

Instructions

- Use black ink or ball point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Punch a hole in the top left corner of each printout.
- Ensure your printouts are in the correct order and attach them (as shown) to Page 2 of this cover sheet using a treasury tag.

Turn over ▶

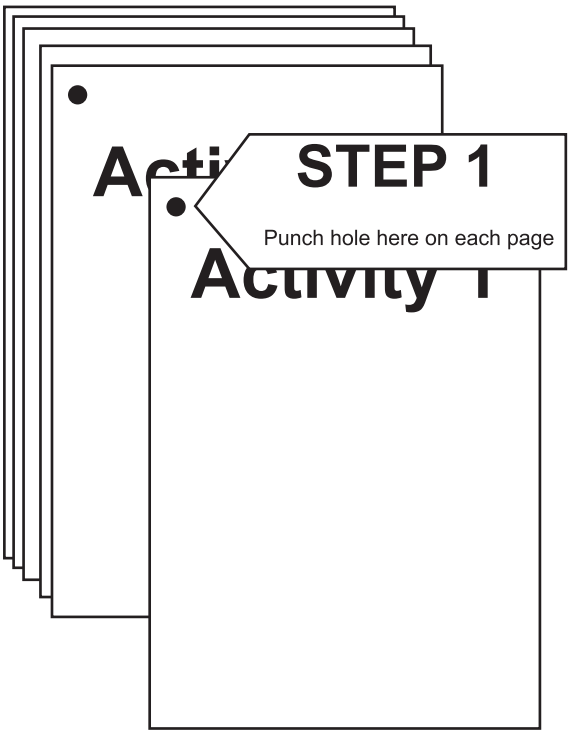
N37322A

2/2

N 3 7 3 2 2 A 0 1 1 6

edexcel
advancing learning, changing lives

Put 'treasury tag' through this hole



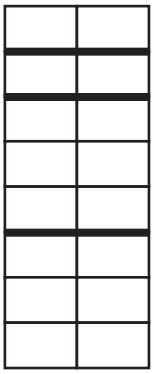
STEP 2 **Arrange your pages in this order, face up.**

Activity 1
Activity 2
Activity 3
Activity 4
Activity 5
Activity 6

STEP 3 Put a 'treasury tag' through all your pages

STEP 4 (last)

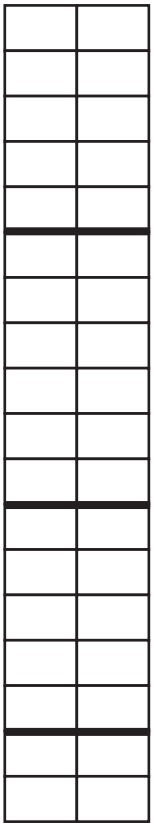
FOR EXAMINER'S USE ONLY



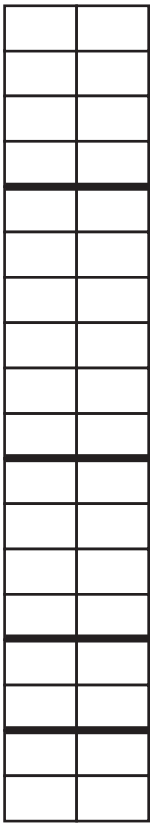
A1

SWW

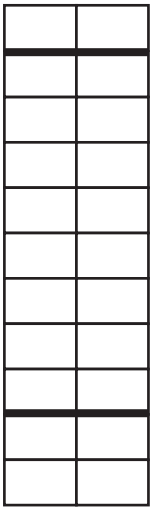
A2



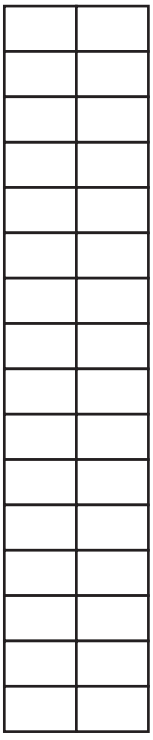
A3



A4



A5



BLANK PAGE

Edexcel GCE

Applied Information and Communication Technology

Unit 9: Communication and Networks

Sample Assessment Material

Scenario

Paper Reference
6959/01

The scenario should be distributed to candidates at least three working weeks before the examination.
Note: There are **no** practice files for this examination.

This scenario should be used for the purposes of preparing candidates for the examination. This copy **must not** be taken into the examination. The information contained in the scenario will be included in the examination paper.

Further details are in the Instructions for the Conduct of Examinations (ICE), available from the Edexcel website for this qualification.

Edexcel will not accept any request for special consideration should candidates be given the incorrect scenario for the examination they are sitting.

Turn over ▶

N37323A

2/2

N 3 7 3 2 3 A

edexcel
advancing learning, changing lives

The Green Bay Building Company

The Green Bay Building Company was founded by David Green in 2003.

Since its inception the Green Bay Building Company has created many successful developments.
David has also pioneered the idea of intelligent housing estates. In the past there have been 'intelligent buildings' however David has taken this one step further and linked all the houses to a central computer. This allows the buildings to share facilities such as solar panels, wind turbines and other shared resources. At the same time, the central computer monitors various aspects of the fuel usage of each of the houses. This provides David's company with information upon which he can base the designs of future developments. It also provides the owners with details for their Home Information Pack should they wish to sell their property. David wants all the central computers of each development to be linked to the Head Office.

David's business has expanded at such a rate that the single floor, serviced offices can no longer hold his company. A move to new offices is to coincide with the recruitment of a number of personnel. The new offices will be in Oxford, not far from where David lives.

David's new offices will have two floors. On the top floor will be David's office, the offices of the company architects and the accountants. In addition there will be an office for the statistician, whose job it is to monitor and produce information from the remote housing estate computers.

The Finance Department will accommodate two accountants and their secretary. Each person will have their own computer and they will share a printer. There will also be a fax machine and a photocopier.

There are two architects who will each have their own computer and printer. They will share a plotter for printing their plans.

David has a laptop which he will connect to the network when in the offices.

The ground floor will be shared by the Administration and the IT Departments. The Administration Department will consist of 5 clerical workers who deal with planning applications and other administrative functions. Each worker will require their own computer, and they will share two printers. There will also be a fax machine and a photocopier here.

The IT Department consists of one IT technician who will have his own computer and printer. His office will be next to the server room which will contain all other equipment.

David knows what he wants to do with the Green Bay computer system but lacks the technical expertise to implement his ideas. You have therefore been employed as a network manager/designer by the Green Bay Building Company and you will share the office with the IT technician.

Edexcel GCE

Applied Information and Communication Technology

Unit 9: Communication and Networks

Sample Assessment Material

Assessment window 3 weeks
Time: 10 hour

Paper Reference
6959/01

You must have:
Short treasury tag, cover sheet

Instructions

- Complete your candidate details on the cover sheet provided.
- All tasks must contain your name, candidate number, centre number and activity number.
- At the end of the examination:
  – *All printouts should be placed in the correct order.*
  – *Use a treasury tag to attach your printouts **(as shown)** to Page 2 of the cover sheet.*

Information

- The total mark for this paper is 90. There are **five** activities in this examination totalling 88 marks. 2 further marks are allocated to Standard Ways of Working.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read through the Scenario carefully.
- Work through the activities in order.
- Attempt **ALL** activities.
- Label your printouts clearly as instructed.
- Printing must be undertaken within the examination period.

Turn over ▶

N37322A

2/2

N 3 7 3 2 2 A

edexcel
advancing learning, changing lives

The Green Bay Building Company

The Green Bay Building Company was founded by David Green in 2003.

Since its inception the Green Bay Building Company has created many successful developments.
David has also pioneered the idea of intelligent housing estates. In the past there have been 'intelligent buildings' however David has taken this one step further and linked all the houses to a central computer. This allows the buildings to share facilities such as solar panels, wind turbines and other shared resources. At the same time, the central computer monitors various aspects of the fuel usage of each of the houses. This provides David's company with information upon which he can base the designs of future developments. It also provides the owners with details for their Home Information Pack should they wish to sell their property. David wants all the central computers of each development to be linked to the Head Office.

David's business has expanded at such a rate that the single floor, serviced offices can no longer hold his company. A move to new offices is to coincide with the recruitment of a number of personnel. The new offices will be in Oxford, not far from where David lives.

David's new offices will have two floors. On the top floor will be David's office, the offices of the company architects and the accountants. In addition there will be an office for the statistician, whose job it is to monitor and produce information from the remote housing estate computers.

The Finance Department will accommodate two accountants and their secretary. Each person will have their own computer and they will share a printer. There will also be a fax machine and a photocopier.

There are two architects who will each have their own computer and printer. They will share a plotter for printing their plans.

David has a laptop which he will connect to the network when in the offices.

The ground floor will be shared by the Administration and the IT Departments. The Administration Department will consist of 5 clerical workers who deal with planning applications and other administrative functions. Each worker will require their own computer, and they will share two printers. There will also be a fax machine and a photocopier here.

The IT Department consists of one IT technician who will have his own computer and printer. His office will be next to the server room which will contain all other equipment.

David knows what he wants to do with the Green Bay computer system but lacks the technical expertise to implement his ideas. You have therefore been employed as a network manager/designer by the Green Bay Building Company and you will share the office with the IT technician.

Instructions to Candidates

All documents must have a header and a footer. The header must contain the activity number. The footer must contain your name, candidate number and centre number.

A minimum font size of 10 should be used in all word processed documents, using a font type suitable for business purposes.

Diagrams should be large enough for the detail to be read.

Activity 1 – Benefits of networks (suggested time 1 hour)

The accountants are concerned that their confidential data may be viewed by other personnel. They have asked David for a peer-to-peer network in their department. David is not sure if granting their request will be good for his business and has asked you to produce some briefing notes to help him make a decision.

(a) Produce diagrams showing what both peer-to-peer and client-server architecture might logically look like for this scenario.

(2)

(b) Explain to David the advantages and disadvantages of independent peer-to-peer networks, rather than connecting the Finance Department to the central network.

(6)

Evidence to be submitted for (a) and (b)

No more than **two** A4 pages of computer output:

- Diagrams illustrating what both peer-to-peer and client-server architecture might logically look like for this scenario.
- Briefing notes explaining the advantages and disadvantages of setting up an independent peer-to-peer network for the accountants rather than connecting them to a central network. The notes should relate to the scenario and be written in non-technical language.

(Total for Activity 1 = 8 marks)

Activity 2 – Components of a network (suggested time 2 hours)

Computer networks are made up of hardware devices, software and media.
David Green has asked you to design an appropriate network solution for The Green Bay Building Company's network.

In order to help David understand why you will be recommending particular components he has asked you to provide information about possible components of the network.

Investigate these network components:

- Bridge
- Gateway
- Hub
- Repeater
- Router
- Server
- Switch

*(a) Produce guidance for David, explaining the functions of all of the components listed. The explanations should be helpful to David, who is not an IT expert. Pay particular attention to the quality of your written communication.

(12)

(b) For each of the components listed recommend, with a reason, if it should or should not be used in your network design for the scenario.

(5)

Evidence to be submitted for (a) and (b)

No more than **three** word processed A4 pages:

- ❑ Guidance for David, explaining in non-technical language the functions of all the components listed.
- ❑ Your recommendation as to which components will be required for your network together with reasons why others would not be of any use.

(Total for Activity 2 = 17 marks)

Activity 3 – Network design (suggested time 4 hours)

Having investigated the various components, you now need to design an appropriate network solution for Green Bay Building Company's network.

(a) Use network design software to produce the logical network design for the complete project

(12)

(b) Explain and justify any decisions that you have made regarding the selection and positioning of network devices and equipment

(6)

(c) Draw up a scheme for implementing IP addresses to be used within the network, give an indication of the actual IP addresses to be used.

(7)

The intelligent housing estates need to be able to send data to the Head Office. Owing to the distance between the developments and the Head Office it is not possible to link the computers in each development to the central computer by point to point cable links such as LAN or fibre optic connections.

(d) Advise on **two** methods of connecting the sites together

(8)

(e) Recommend the most suitable method of connection.

(3)

Evidence to be submitted for (a), (b) and (c)

No more than **three** A4 pages of computer output:

- ❑ A **one** page design for the total network
- ❑ Notes justifying each major decision made with regard to the network design
- ❑ A scheme for IP addresses with some indication of the actual IP addresses to be used

Evidence to be submitted for (d) and (e)

On no more than **one** word processed A4 page

- ❑ Notes describing two different methods of connecting the developments to the Head Office
- ❑ Your recommendation as to which method of connection is most suitable

(Total for Activity 3 = 36 marks)

Activity 4 – Protocols (suggested time 1 hour)

The Green Bay Building Company wants to organise educational visits for local schools and colleges. The visits will include talks on environmental issues and on the way the company works.

You have been asked to create a slide show presentation explaining the TCP/IP model.

The presentation should include slides on:

(a) The purpose of each of the four layers of the TCP/IP model

(4)

(b) The functions of each layer of the TCP/IP model, the protocols and their roles

(4)

(c) An explanation of the differences between TCP and IP

(3)

Evidence to be submitted for (a), (b) and (c)

- ❑ The **six** slide presentation, with speaker's notes, printed out with **one** slide per A4 page.

(Total for Activity 4 = 11 marks)

Activity 5 – Network management (suggested time 2 hours)

David is worried that, as the site is liable to flooding, equipment and data may be lost. The success of the company depends on data records spanning several years being kept and not lost due to hardware failure caused by natural disasters such as flooding and lightening strikes.

Draw up a contingency plan covering the internal network, all its components and any data stored on it.

The plan should include:

(a) strategies to prevent network problems occurring as a result of natural disasters

(10)

(b) strategies for disaster recovery.

(6)

Evidence to be submitted for (a) and (b)

No more than **two** word processed A4 pages.

A contingency plan for the network to include:

- ❑ Prevention of network problems occurring as a result of natural disasters
- ❑ Disaster recovery

(Total for Activity 5 = 16 marks)

Standard ways of working.
All printouts must contain the activity number, your name, candidate number, and centre number.
Pages must be securely fastened to the cover sheet and in the correct order.
A minimum font size of 10 should be used for all word processed documents.

(Standard ways of working = 2 marks)

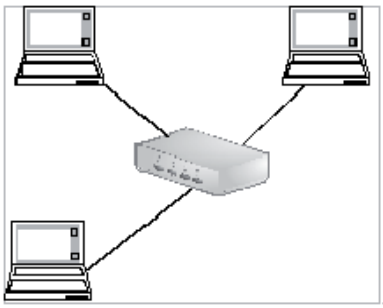
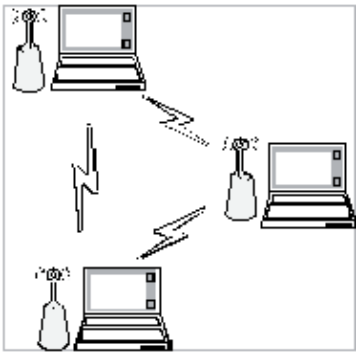
TOTAL FOR PAPER = 90 MARKS

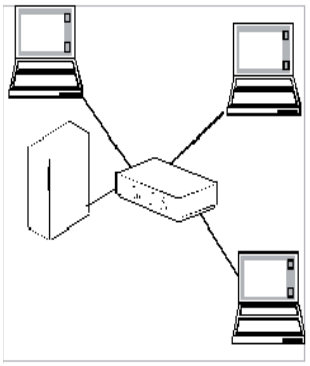
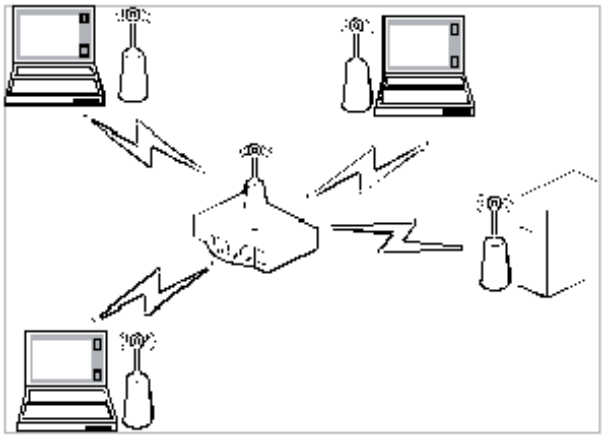
BLANK PAGE

Sample Mark Scheme

Unit 9: Communication and Networks

Activity 1 — Benefits of networks

Question Number	Required evidence	Mark
1(a)	**Diagrams illustrating what both peer-to-peer and client-server architecture might logically look like for this scenario.** The scenario describes two accountants and a secretary. The network size is therefore 3 computers.	
	Peer-to-peer network Diagram showing peer-to-peer network should show a distribution structure with connection to each computer. The diagram should make it clear that this is a distributed system with no central server. Possible architectures: star (using a mini-hub), WiFi. (Must be 3 computers.)  Diagram shows star, connected by mini hub / switch.  Diagram shows WiFi mesh	

	Client-server network Diagram showing client server centralised system, each computer accessing a central server through a hub, switch, or WAP.  or  Examples of diagram (Must be 3 computers plus server.) (2 x 1)	**(2)**

Question Number	Required evidence	Mark
1(b)	**Briefing notes explaining the advantages and disadvantages of setting up an independent peer-to-peer network for the accountants rather than connecting them to a central network. The notes should relate to the scenario and be written in non-technical language.**	
	Advantages, must be related to the scenario and in language a user can understand to get a mark. Any **three** of: • Simple procedures to use and set up, no special training for accountants • Accountants will have ownership of their own mini network • Only accessible by Finance Department personnel • Secure from external problems, viruses, worms, security, etc. relates to accountants worries. **The following points would need a scenario related expansion to be awarded** • There will be a faster start up and log on if decentralised rather than centralised. • Not reliant on main network. • No server, therefore cheaper. • No network manager, therefore cheaper. (3 x 1)	
	Disadvantages, must be related to the scenario and in language a non-technical reader can understand to get a mark Any **three** of: • No network manager – accountants will have to manage the network themselves including upgrading, adding users. • Accountants lack of access to centralised services such as email, access to Internet, file sharing, etc. • More difficult to share real time data with other relevant users / slower performance when sharing data. • Security on actual computers may be low, accountants not security experts. **The following points would need a scenario related expansion to get a mark** • Maintenance more difficult as not part of a central network • Limitation on number of nodes, dependent on OS. accept double figures • Software installation has to be done on separate computers. (3 x 1)	**(6)**

Activity 2 — Components of a network

Question Number	Indicative content
2(a) **QWC (i-iii)**	Evidence required for (a) **These are the BCS definitions** The details of expected content are given below **Bridge** • Provides a link between two local area networks / parts of network. • It may also convert the data into the appropriate form for the other system. • It is simply a link. • There is no concept of it providing an entrance to a computer network. **Gateway** • Is a computer system that links two dissimilar networks. • Gateways usually provide a single point of entry to a secure computer network. • The gateway converts data passing through it into the appropriate form for the second network. • the gateway can monitor usage and also limit access between the networks to authorised users. **Hub** • Allows any two computers connected to the hub, or through other hubs, to send data to each other. • A simple hub can only deal with one link at a time and can be slow if many computers are using the same hub. **Repeater** • Are used to link two cable segments. • Because of the loss of signal strength in network cables, a repeater amplifies the signals it receives before passing them on. **Router** • Are sophisticated switched hubs. • They hold information about the addresses of computers attached to the network and can forward data efficiently via an appropriate route. • They are generally used as Gateways where a LAN is connected to a larger network such as the Internet. **Switch** • Also called a switched hub. • They act like hubs but have switching circuitry which allows them to deal with many connections simultaneously. **Server** • Is a computer on a network that provides a resource that can be used by any authorised client station. • Servers include e.g. file server, print server, database server, web server.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1-4	Descriptions lack sufficient detail to explain the functions of the components and these may not be appropriate for the target audience. Fewer than six components are described. The candidate uses everyday language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar are used with limited accuracy.
Level 2	5-8	Descriptions include explanation of some functions of the components and these may be appropriate for target audience in some instances. Functions of at least 6 components are described and at least 2 explained. The candidate uses some specialist terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar are used with some accuracy.
Level 3	9-12	Descriptions explain functions and are appropriate for the target audience. All seven are described and at least half are explained. The candidate uses a range of appropriate specialist terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.

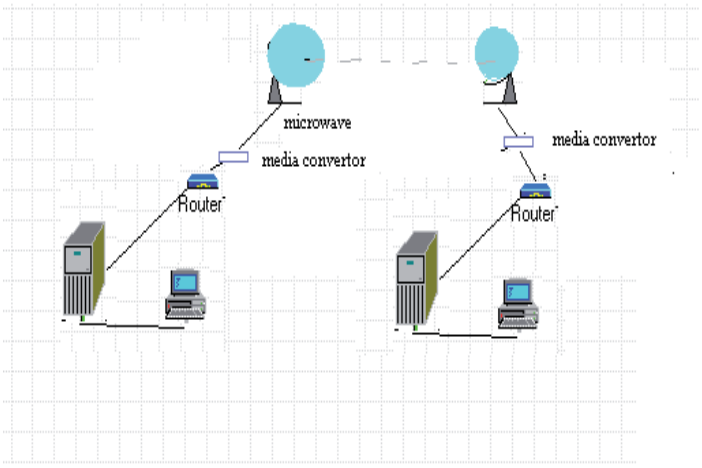
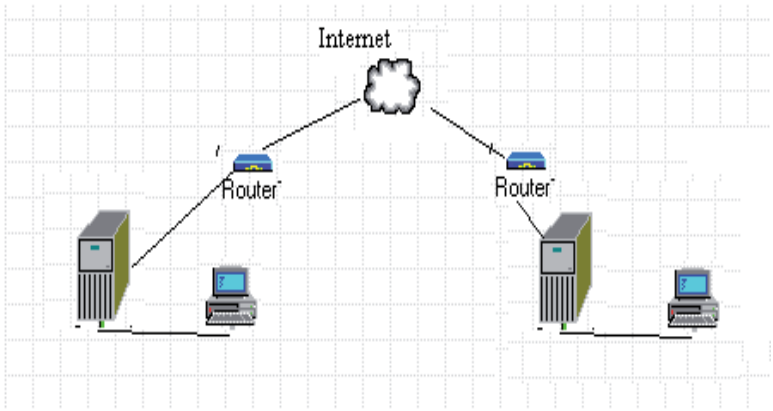
Question Number	Required evidence	Mark
2(b)	**For each of the components listed recommend, with a reason, if it should or should not be used in their design for the scenario.** The recommendations must be justified. Recommendations should take into consideration performance and be related to the scenario. Award 1 mark each (maximum 5) for: • Server recommended + reason (1) • Gateway recommended + reason (1) • Router or Switch recommended + reason (1) • Router or Switch <u>not</u> recommended + reason (1) • Hub <u>not</u> recommended + reason (1) • Bridge <u>not</u> recommended + reason (1) • Repeater <u>not</u> recommended + reason (1) (5 x 1)	**(5)**

Activity 3 — Network design

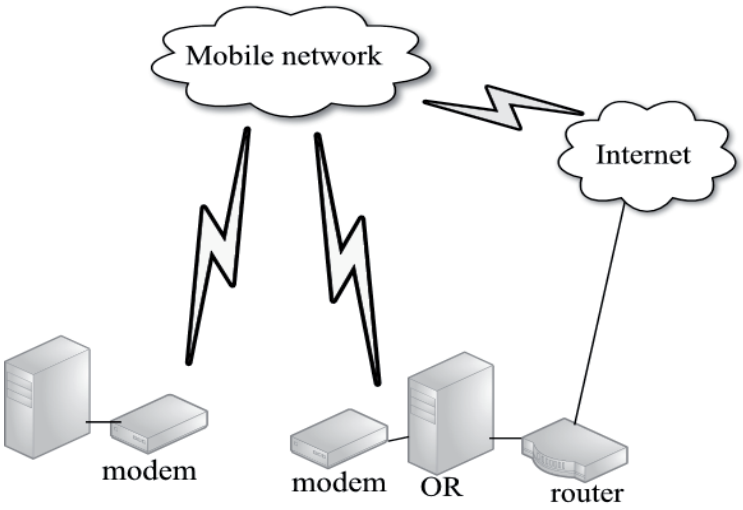
Question Number	Evidence required	Mark
3(a)	**A one page design for the total network**	
	A network layout diagram in an appropriate format showing the logical layout of the network. The diagram should be comprehensive, showing how each building is connected back to the centre and a minimum of how each room or set of computers is connected (showing hundreds of individual PCs would probably not be the most effective method of presentation). The diagram should show how switches/hubs, access points, and routers are used together to create the network. There are many possible configurations for the network and thus any sensible layout is acceptable. The network diagram must be understandable. A device must be labelled to gain marks specific to that device. 1 mark each for: a. Server in server room (1) b. Cables shown (1) c. Types of cables (1) d. links to external computers (1) e. Switch / hub to router (1) f. Sensible position of switches / hubs (1) g. Sensible, short Server to router connection (1) h. Sensible number of PCs and non-networked printers (1) i. Correct connections for architects shared plotter, networked (1) j. Photocopier and fax in finance and admin. (1) k. Shared printers, 1 in finance, 2 in admin. (1) l. Sensible position of access points / cable in David's office (1) m. Sensible network nodes (1) Probably: David, architect, finance, statistician Admin, IT, Server room **Maximum** (12 x 1)	**(12)**

Question Number	Required evidence	Mark
3(b)	Evidence required for (b) **Notes explaining and / or justifying each (major) decision made with regard to the network design** Notes justifying selection of components, Notes explaining selection of cable types and location of components. 1 mark for each valid point. e.g.Put a firewall in front of the router to block unauthorised access to the system from outside 1mark. There are no marks for descriptions of what is in the diagram. e.g. Put a firewall in front of the router 0 marks (6 x 1)	**(6)**

Question Number	Required evidence	Mark
3(c)	**A scheme for IP addresses with some indication of the actual IP addresses to be used.** Any logical grouping of IP addresses within the network range specified is acceptable assuming a Class B / C private network: The more fully specified the ranges of addresses are the more marks that should be allocated up to a maximum of 7, for example: **a.** Address range (1) **b.** Addresses for devices e.g. printers (1) **c.** Address for (DNS) server (1) **d.** Addresses for router / gateway (1) **e.** Indicating which addresses are dynamic and which are static / explain the use of DHCP (1) **f.** Addresses for remote computers (1) **g.** Explanation of subnet mask/category B /C (1) **h.** Justify category (1) **i.** Explain structure of chosen category (1) (7 x 1)	**(7)**

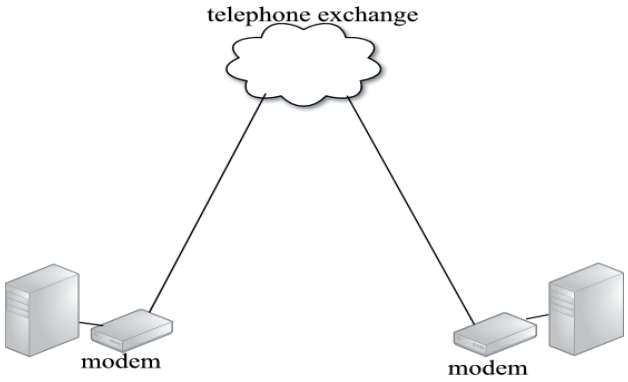
Question Number	Required evidence	Mark
3(d)	**Illustrated notes describing the different methods of connecting the developments to the Head Office.** For each of **two** methods: 1 mark for diagram 1 mark for each explanation point to a maximum of 3 Explanation points may be text or as labels on the diagram **1.Microwave**  Connection from PC to router could be WiFi • Microwave dishes used to transmit data over long distances.-4 miles an easy distance • Uses high frequency microwave to carry data • Relatively easy to set up for a contractor • Speed typically 1-10 mbps **2.Connection via the Internet**  Connection from PC to router could be WiFi • Connect at both ends to Internet using normal Internet routing • No special contracting required. • Speed depends on ISP	

3.Connection via mobile telephone system



- Connect at development end by radio / 3G modem
- Connect at head office via modem or Internet
- No special contracting required

4.Connection via leased line



- Permanent / automatic phone connection
- No special contracting required.
- guaranteed service level

1 + (3 x 1)
1 + (3 x 1)

(8)

Question Number	Required evidence	Mark
3(e)	**Recommendation as to which method of connection is most suitable** The recommendation must be justified. The quality of the justification is the most important element of this rather than the particular recommendation as all three solutions are viable. The justifications should be related to the scenario. They could involve: • security • cost • performance (3 x 1)	**(3)**

Activity 4 — Protocols

Question Number	Required evidence	Mark
4	for (a), (b) and (c) **The six slide presentation, with speaker's notes, printed out with one slide per A4 page.** • The purpose of each of the four layers of the TCP/IP model. • The functions of each layer of the TCP/IP model , the protocols and their roles. • Explanation of the differences between TCP and IP	
4(a) + 4(b)	**The purpose of each layer of the TCP/IP model, the protocols and their roles.** **Purpose**: Application **Function**: Handles issues of representation, encoding, and dialog control. Protocols - DHCP, gopher, IMAP4, IRC, NNTP, POP3, *FTP, HTTP, SMTP, DNS, TFTP, SMB, AFP, ASP,* and many others **Purpose**: Transport **Function**: Deals with the quality of service issues of reliability, flow control, and error correction. Protocols - *TCP, UDP, ATP,* DCCP, SCTP, RTP, and more **Purpose**: Internet **Function**: Divide TCP segments into packets and send them from any network. The packets arrive at the destination network independent of the path they took to get there. Protocols - *IP, AARP,* RARP, ICMP, RIP, and many more **Purpose**: Network **Function**: Known as the host-to-network layer. This layer is concerned with all of the components, both physical and logical, that are required to make a physical link. Protocols - *Ethernet,* 802.11, WiFi, PPTP, PPP, and many more **For each layer**: (a) 1 mark for Purpose, (4 x 1) (b) 1 mark for Function identifying at least **one** correct protocol with explanation. (4 x 1)	**(8)**

Question Number	Answer	Mark
4(c)	**An explanation of the differences between TCP and IP** 1 mark per explanation point to a maximum of 3. Explanations must include both protocols • TCP, connection orientated IP, connectionless • TCP, sends unstructured stream of bytes IP, messages are broken up into small independent "packets" • TCP, communicates between applications IP, communicates between computers / hardware • TCP, occupies a communication link (until contact is broken) /sets up a full duplex connection IP, messages are routed in packets / sends on several links / can use same link for many messages (3 x 1)	**(3)**

Activity 5 — Network Management

Question Number	Required evidence	Mark
5	for (a) and (b) **A contingency plan for the network to include:** **(a) Prevention of network problems occurring as a result of natural disasters** **(b) Disaster recovery**	
5(a)	**Do not award marks for human caused disasters such as viruses or theft.** Examples **Prevention of problems occurring:** 1. Routine, documented backup procedures 2. Back up for hardware, back up server, store of spare parts 3. Isolation of parts of network 4. UPS 5. File server on first floor 6. Other sensible and relevant 7. network monitoring software / policy / code of conduct 8. sensible example of preventative maintenance 9. hot swappable components / mirroring / RAID Up to 2 marks for each strategy with an explanation of why needed or how to set up. Maximum of 10 marks	**(10)**

Question Number	Answer	Mark
5(b)	**Recovery of Data** 1. Off site storage of data 2. Have a documented recovery procedure 3. Maintain accurate documentation of hardware and software configurations. Copies of software securely stored. 4. Temporary hardware loan arrangements 5. standby replacements, machines or other essential items 6. alternative site 7. Other sensible and relevant Up to 2 marks for each strategy with an explanation of why needed or how to set up. Maximum of 6 marks	**(6)**

SWW	Answer	Mark
SWW	Authenticating Work (All WP pages have task number, Name, centre number)	**(1)**
	Appropriate Structure (Pages in correct order & Folder assembled correctly)	**(1)**

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email: publications@linneydirect.com

Publications Code UA021770 May 2009

For more information on Edexcel and BTEC qualifications please visit our website: www.edexcel.com

Edexcel Limited. Registered in England and Wales No. 4496750
Registered Office: One90 High Holborn, London WC1V 7BH. VAT Reg No 780 0898 07