

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCE

Applied Information and Communication Technology

Unit 9: Communications and Networks

COVER SHEET

9–27 January 2012

Paper Reference

6959/01

You do not need any other materials.

Total Marks

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.

P40572A

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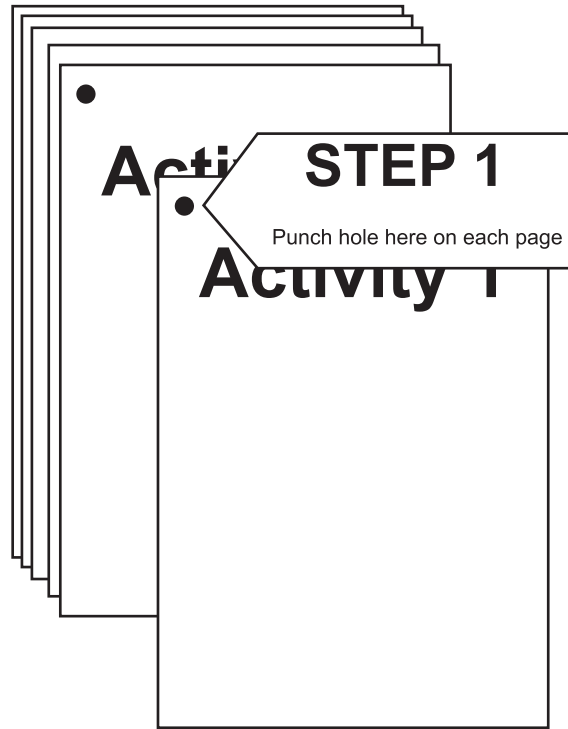
1/1/1



Turn over ►

PEARSON

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)



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Edexcel GCE

Applied Information and Communication Technology Unit 9: Communications and Networks

9–27 January 2012

Assessment window: 3 weeks

Time: 10 hours

Paper Reference

6959/01

You must have:

Short treasury tag, Cover sheet

Instructions

- Complete your candidate details on the cover sheet provided.
- All printouts 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 totaling 88 marks. **2** further marks are allocated to Standard Ways of Working.
- The marks for **each** question, within an activity, 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 ►

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PEARSON

Scenario

Lyonesse Showground Ltd

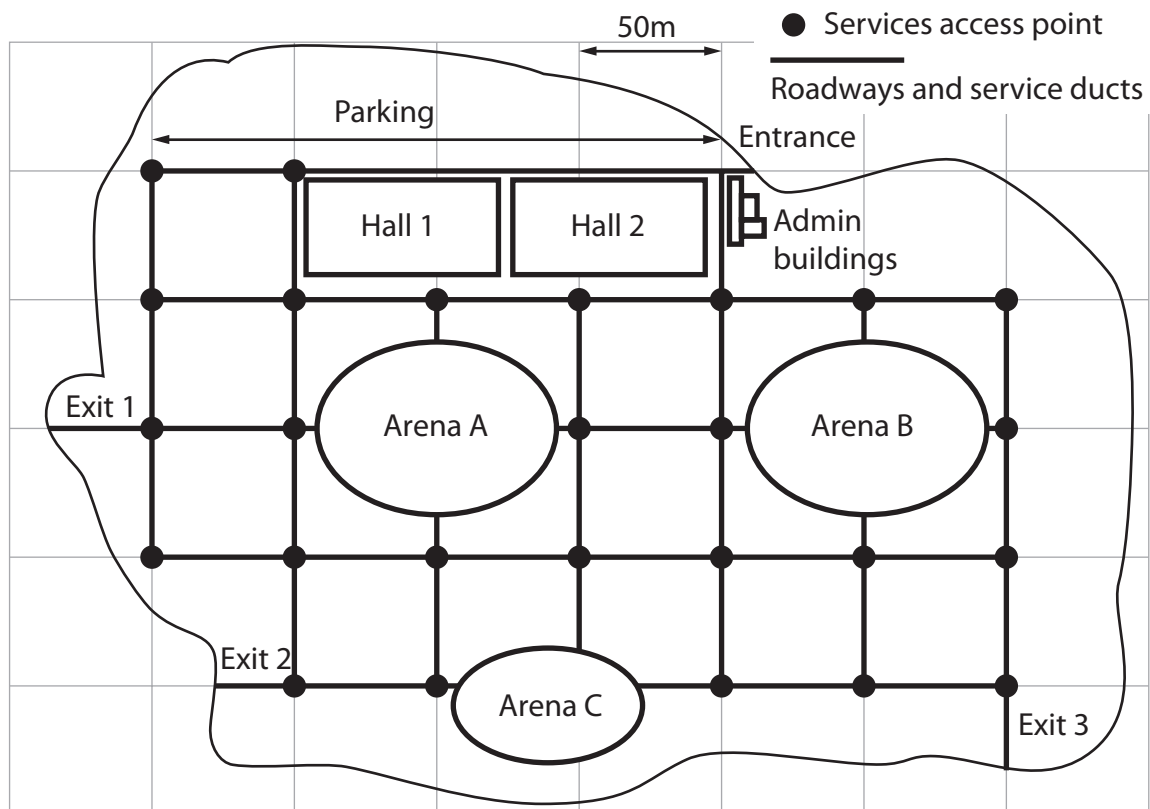
Lyonesse Showground Ltd (LSL) is owned and run by the Knight family. The showground is used to host a wide variety of events throughout the year. Typical events are music festivals, agricultural shows, vintage vehicle rallies, and camping exhibitions.

LSL is planning to install an improved IT system for the whole showground and you have been hired to advise the company. Your point of contact is Tristram Knight, the Works Director, who manages the setting up of the showground for the different events.

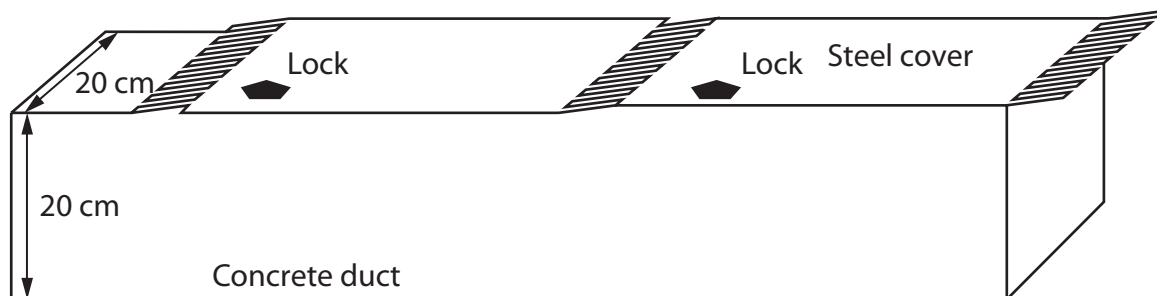
Tristram has a working knowledge of the present systems but is not an IT expert. He believes that it is essential for him and his staff to understand any new infrastructure and your contract requires you to provide suitable briefing documents and training material.

The Lyonesse Showground

The showground has some permanent features, as shown on the sketch map. These are the two exhibition halls, three arenas, the admin buildings, a car park and a grid of roadways. The rest of the showground is covered in grass. LSL owns numerous marquees, ticket booths, mobile toilets, catering booths and other temporary structures, which can be set up within the showground.



There are service ducts running beside the roadways. These consist of 20 cm square concrete channels with lockable steel covers. The covers are in one metre lengths with flexible rubber at each end. This allows easy installation of cables and pipes. You may assume that Hall 1, Hall 2, and the admin buildings have connections to the service ducts wherever they are required.



All of the service ducts have water pipes and mains (240v) electricity cables running through them. Other services such as a gas supply or telephone cable are installed when needed. This makes the system very flexible.

There is a services access point at most roadway junctions. A services access point contains various sockets and taps to allow connections to be made to nearby areas. The flexible nature of the services system means that pipes and cables never need to be laid across a roadway, and when laid across the grassed areas they are exposed for the minimum possible distance.

The existing IT system

The two exhibition halls and the admin buildings are connected to each other by an internal telephone system. Communication to all other areas of the showground is by radio and/or mobile telephone.

The two exhibition halls and the admin buildings have reception areas with external telephone connections and broadband Internet access.

The admin buildings contain a small Local Area Network (LAN) controlled by a server running Windows Server 2003. It is outdated and will be completely replaced.

The two exhibition halls each contain a recently installed copper-cabled LAN, purpose built for running events within each hall. Each of these LANs is an independent domain with its own server, running Windows Server 2008. These LANs will be kept but will need to be linked to the new system.

The new system

An admin and IT centre will be set up in a new extension to the admin buildings.

Following a discussion with Tristram, it is agreed that the new system will consist of:

- the two existing LANs in the exhibition halls, linked to the new system
- a new LAN in the admin buildings
- links to all parts of the showground, including the arenas and temporary structures set up for particular events.

It is also agreed that:

- the admin building LAN will use copper cable
- links to the showground will use a mixture of optical fibre and copper cable.

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 – Research, network management tasks (suggested time 1 hour and 30 minutes)**

At your next meeting with Tristram, he asks you to produce some briefing notes about how the new admin LAN will interact with the existing LANs in the exhibition halls.

At present each hall has its own server, running a Windows Server 2008 operating system. Each server runs its own domain, HALL1 and HALL2. The server for the new admin LAN, which includes the rest of the showground, will also have Windows Server 2008 and will use the existing admin domain, LYONESSE.

Research the technologies and produce a set of notes for Tristram that includes diagrams.

The notes should:

- describe how the existing LYONESSE domain control information should be transferred to the new LYONESSE server
- describe the different types of trust relationships that could be used between the three domains
- recommend which trust relationship should be used
- explain the reasons for your recommendation.

Pay particular attention to the quality of your written communication.

Evidence to be submitted.

On no more than **two** word processed A4 pages:

- a set of notes for Tristram.

Marks will be awarded for the Quality of your Written Communication.

(Total for Activity 1 = 12 marks)

Activity 2 – Network connectivity (suggested time 2 hours)

The system will be administered from the new admin and IT centre in the admin buildings.

Tristram has asked you to advise him about making fixed links between the admin buildings, the exhibition halls, and a connection point at each of the three arenas.

The options are copper cable, fibre optic cable, or a combination of the two.

The possible topologies are star and mesh.

(a) Produce advice for Tristram.

- (i) Describe, with the aid of diagrams, how each network topology could be used to make the fixed links between the admin buildings, the exhibitions halls and the three arenas. (4)
- (ii) State, with reasons, which of the two topologies you recommend. (2)
- (iii) Explain, taking into consideration the size of the showground, which type(s) of cable **could** be used for each link in your chosen topology. (3)
- (iv) State, with reasons, the type of cable you would **recommend** for each link. (3)

(b) Give a budget for the cost of your recommended solution.

The budget should be for network hardware only.

If existing network infrastructure or devices will be used in making the links you must state any assumptions you have made.

Include quantities, with a reason, and cost for each item.

Do not include costs such as tools, labour, building alterations, power sockets, etc. (6)

Evidence to be submitted for (a).

On **two** word processed A4 pages:

- a document on topologies and cable types.

Evidence to be submitted for (b).

On **one** word processed A4 page:

- a budget for your recommended solution.

(Total for Activity 2 = 18 marks)

Activity 3 – Components of a network (suggested time 2 hours)

During a meeting with Tristram you agree these points.

1. The building for the new admin and IT centre will be located where the word 'Admin' is on the sketch map. There will be a five metre gap between the new admin and IT centre and the existing buildings.
 2. The new building will measure 25 metres by 10 metres and will be a single storey. There will be a double door at each end. The interior walls will be movable partitions.
 3. The admin LAN will use copper cable in both the new and existing buildings.
 4. All existing cables and hardware will be replaced.
 5. There are already adequate power outlets, data sockets, and cable conduits in the existing buildings. You will specify the power outlets, data sockets, and cable conduits for the new admin and IT centre.
 6. There are three existing buildings. The two smaller ones will be occupied by Tristram and his staff. They will need a PC and a printer in each building. The printers and the admin LAN must be accessible from Tristram's existing laptop.
 7. The largest of the existing buildings will be used as the Events Office. It will have a flexible layout with spaces defined by movable screens. Different events will require different layouts. There will be eight staff based in the Events Office. They will each need a netbook and they will require a colour laser printer and four easily movable PCs between them.
 8. The new admin and IT centre will house:
 - two receptionists. They will need a PC each, a shared black and white laser printer and a VoIP telephone system
 - two sales staff. They will need a PC each, a shared black and white laser printer and a VoIP telephone system
 - three secretaries. They will need a PC each and a shared colour laser printer
 - six offices for members of the Knight family, who are the Directors of LSL. They will each need an access point for their existing laptops and network access to the colour laser printer used by the secretaries
 - the network manager and two technicians.
- (a) Produce a diagram, showing your recommended layout for the network sockets, power sockets, and cable runs in the new admin and IT centre. Explain your decisions.

(8)

- (b) Produce a table which identifies the hardware and cabling components to be used in the admin LAN. Give a reason for each component.

Do not include cable conduit, data sockets, power sockets or power cables.

Do not include items that would be placed in the service conduits in the wider showground.

(12)

Evidence to be submitted for (a).

On **one** A4 page:

- a diagram showing the layout of the new admin and IT centre and an explanation of your decisions.

Evidence to be submitted for (b).

On **one** word processed A4 page:

- a table which identifies, with reasons, the hardware and cabling components.

(Total for Activity 3 = 20 marks)

Activity 4 – Network design (suggested time 3 hours)

Having agreed with Tristram’s requirements for the Lyonesse Showground (Activities 2 and 3), you now need to design an appropriate network solution.

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

The design must show:

- the fixed links (Activity 2)
- details of the admin network (Activity 3)
- the connecting devices for the HALL1 and HALL2 LANs. The rest of the HALL1 and HALL2 LANs may be indicated by a label, no detail is required
- an example of a connection to an exhibition stand on the grassed area of the showground.

(20)

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

(6)

Evidence to be submitted for (a).

On **one** A4 page of computer output:

- your network design.

Evidence to be submitted for (b).

On **one** word processed A4 page:

- notes explaining each major decision made with regard to the positioning of network devices.

(Total for Activity 4 = 26 marks)

Activity 5 – Benefits of networks (suggested time 1 hour 30 minutes)

- (a) One of the benefits of the new network over the existing system outlined in the scenario will be cost savings.

Tristram has asked you to explain how these cost savings will be achieved.

Produce some notes explaining how the cost savings will be achieved. The notes must be set in the scenario context.

(8)

- (b) Tristram is concerned about securing the completed network from external attack. He has asked you to produce some recommendations on how to secure the connection.

Produce a set of security recommendations for Tristram. Each recommendation must be set in the scenario context and must explain how it helps secure the network from external attack.

(4)

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

On **one** word processed A4 page:

- an explanation of how cost savings may be achieved, and a set of recommendations for security measures.

(Total for Activity 5 = 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
