

Advanced Subsidiary GCE (or Advanced GCE)

G055

**APPLIED INFORMATION AND
COMMUNICATION
TECHNOLOGY**

Unit G055: Networking Solutions

Specimen Paper

Time: 1 hour 30 minutes

Candidates answer on the question paper.

Additional materials:

Pre-released material and tasks with candidate instructions
Candidate's pre-prepared materials

Candidate
Forename

Candidate
Surname

Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do not write in the bar codes.
- Do not write outside the box bordering each page.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is 100.

FOR EXAMINER'S USE

Task 2	
Task 3	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
TOTAL	

This document consists of **8** printed pages.

SECTION A

Answer **all** questions.

This section relates to the case study and tasks on Intrepid Explorations Café (IEC).

- 1 Describe **one** advantage and **one** disadvantage to IEC’s customers of installing a network with access to the Internet.

Advantage

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.....

Disadvantage

.....

.....

[4]

- 2 IEC can choose to install a peer-to-peer network or a client-server network.

- (a) Describe **two** features of a peer-to-peer network.

Feature 1

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Feature 2

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[4]

- (b) Explain why a peer-to-peer network should be considered by IEC.

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[3]

3 The new network could be based on a logical star topology.

(a) Draw and label a diagram to show a logical star.

SPECIMEN

[3]

(b) Explain the operation of a logical star.

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[3]

4 IEC could choose to install a wireless network.

(a) Describe **two** items of hardware required for a wireless local area network (WLAN).

Item 1

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Item 2

.....

..... [4]

(b) Explain why a wireless network could be the most suitable for IEC.

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..... [2]

5 IEC's network will need some new hardware.

Describe the function of each of the following types of hardware.

(a) proxy server

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..... [2]

(b) UPS

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..... [2]

6 Identify and explain the purpose of **two** items of hardware required to connect IEC's network to the Internet.

Item 1

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Item 2

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[6]

7 IEC will upload its web pages from its network to the ISP's server so that the pages can be viewed. Describe one feature of each of the following protocols, used for uploading and viewing web pages.

FTP

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HTTP

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[4]

8 When data is transferred across IEC's network a communications log will be kept and referred to when solving problems for customers.

Explain how IEC will use the communications log to help solve common data transfer problems.

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[4]

9 Customers at IEC will be able to access the Internet.

(a) Describe the following Internet services that customers will have available to them.

Access to WWW

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Data file exchange

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..... [4]

(b) Evaluate the consequences to IEC of providing these services for its customers.

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..... [7]

SECTION B

You do not need the case study or your tasks to answer these questions.

10 A company develops its own website, which will be hosted by an ISP.

(a) Explain how the company will upload the finished website to the ISP's server.

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..... [4]

(b) (i) Define the term 'bandwidth'.

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..... [1]

(ii) Describe how bandwidth affects the time it takes for pages to be uploaded.

.....
.....
.....
..... [2]

(iii) State the calculation used to estimate the time to transfer a file.

.....
..... [1]

11 Describe the function of a client in a client-server network.

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..... [2]

12 Explain the process of accessing a discussion forum to post a message.

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..... [3]

13 Identify a health consideration to be taken into account when designing workstations for network users.

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..... [2]

14 Explain how computer equipment can be protected from theft.

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.....
..... [3]

Paper Total [100]

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**APPLIED INFORMATION AND
COMMUNICATION TECHNOLOGY**

G055

Unit 16: Networking Solutions

Specimen Mark Scheme

The maximum mark for this paper is **100**.

SPECIMEN

G055 Networking solutions

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

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

Pre-release material

Task 2

Network diagram showing a peer-to-peer network (**no marks if candidate shows a server**)

Any **six** of

A network printer (or connection to network shown)

B patch panel

C hub/switch or wireless access point

D router

E modem

F bridge (between office computers and café computers)

G UPS

H cabling positioned safely eg not across walking areas.

[6]

Cable and connectors

1 mark for matching cable and connector

(eg UTP/RJ-45, STP/RJ-45, Wireless/USB or PCMCIA, Fibre optic/ST or SC)

[1]

1 mark for appropriate cable and connector for IEC network

(eg UTP/RJ-45, Wireless/USB or PCMCIA)

(do **not** accept fibre)

[1]

1 mark for description of suitability of cable choice

(eg covers required distances/UTP; acceptable speed/UTP; no need for wiring/wireless)

[1]

Other network components

1 mark for identification of appropriate connecting equipment

(eg router, hub/switch or wireless access point/ wireless hub, bridge)

[1]

1 mark each for description of suitability of connecting equipment from

- controls traffic/forms connection to Internet/segments network(1)
- justification (eg router – allows shared Internet access;

hub - simple, low cost;

switch - better security, faster transmission;

WAP - no need for cabling;

bridge – separates café and office networks) (1)

Max 2 marks

[2]

Any **two** items of additional hardware identified from

- network printers
- portable backup device
- network interface cards
- UPS

1 mark each to a maximum of 2

[2]

1 mark each for description of suitability of up to **two** hardware items from

- network printers – no need for server/direct access to print queue for all users
- portable backup device – data security for each computer in office
- network interface cards – control access to network media
- UPS – allow continuous operation/reduce risk of loss of data due to power fluctuations

1 mark each up to a maximum of 2 marks

[2]

1 mark for any **one** item of additional software/configuration identified

- network operating system
- network drivers
- protocols
- email software
- print queue software.

1 mark

[1]

1 mark for description of suitability of software item chosen from

- network operating system – controls operation of network
- network drivers – deal with operation of network interface cards
- protocols – (eg NetBEUI, TCP/IP) settings for communication on network
- email software – allows internal communication between users on the network
- print queue software – controls printing for users.

1 mark

[1]

Evaluation

Mark	Guidance
3	A strength and a weakness in the method(s) used is identified
2	A strength or a weakness in the method(s) used is identified
1	Some comment is made on method(s) used

[3]

Task 3

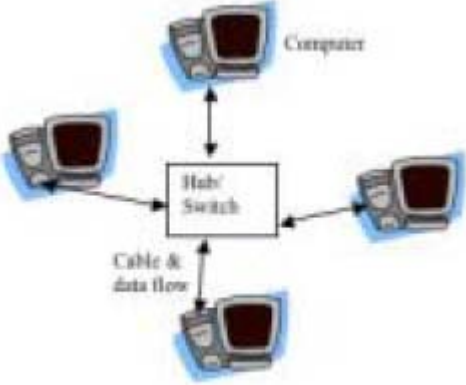
Band	Mark range	
H	7-9	Candidates will describe and analyse in detail how customers of IEC might use and benefit from identified services provided by a website. The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.
M	4-6	Candidates will describe how customers of IEC might use services provided by a website. Limited analysis of benefits will be given. The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.
L	1-3	Candidates will identify and describe the use of a limited range of services that might be provided by a website. Information will be poorly expressed and there will be a limited, if any, use of technical terms. Errors of grammar, punctuation and spelling may be intrusive.
	0	No response or no response worthy of credit

To include eg:

Service (S)	Use (U)	Analysis of use by customers (A)
e-commerce	book holiday packages online	can pay online/ check availability and compare prices in one go
discussion forums	customers submit reviews	can give/read feedback on destinations or activities
search by destination	customers can find holiday information	Easier access to wider range of holiday information
file storage	customers can upload files/photographs	can be used to back up/to share /save space on portable devices
advertising	Customers can be informed of special deals	Instant access to latest information from home

[9]

Section A		
Question Number	Answer	Max Mark
1	<p>Describe one advantage and one disadvantage to IEC's customers of installing a network with access to the Internet.</p> <p>Advantage 1 mark for identification and 1 mark for expansion of any of eg:</p> <ul style="list-style-type: none"> • wider choice of options (1) than IEC can offer themselves (1) • access to email (1) more contact with the company (1) • on-line booking (1) independently or with an adviser (1) • quicker access to customer details (1) when rebooking (1). <p>Disadvantage 1 mark for identification and 1 mark for expansion of any of eg</p> <ul style="list-style-type: none"> • likely to have to wait for a machine (1) other customers using it (1) • have to pay to use Internet (1) adds to cost of holiday (1) • takes time to browse (1) without being directed to anywhere specific (1) • increased risk (1) to personal privacy (1). 	[4]
2(a)	<p>Describe two features of a peer-to-peer network.</p> <p>Any two of:</p> <ul style="list-style-type: none"> • all computers are equal (1) they both provide and use services of other computers (1) • there is no central server (1) files are distributed throughout the network (1) file sharing is controlled by individual computers (1) • only a few computers on the network (1) small amount of shared data and resources (1) • no central management of security (1) individual users are responsible for their own computers (1). 	[4]
2(b)	<p>Explain why a peer-to-peer network should be considered by IEC.</p> <p>Three from:</p> <p>peer-to-peer is the cheaper option (1) as no server costs (1) each user can have complete control (1) managing their own machine (1) there will be less need for a network manager (1) this will be a small network (1) less than 10 computers (1)</p>	[3]

Question Number	Answer	Max Mark
<p>3(a)</p>	<p>Draw and label a diagram to show a logical star.</p> <p>1st mark for a correct diagram (not necessarily labelled) plus any three from: 1 mark for showing direction of flow 1 mark for each correct label up to max 2</p> 	<p>[3]</p>
<p>3(b)</p>	<p>Explain the operation of a logical star.</p> <p>Any three of</p> <p>data travels in both directions (1) all data travels through the hub/switch (1) data travels from computer and hub/switch (1) hub broadcasts data to all computers (1) switch makes a connection between sending and receiving computer (1) data is sent from hub/switch to computer (1)</p>	<p>[3]</p>

Question Number	Answer	Max Mark
4(a)	<p>Describe two items of hardware required for a wireless local area network (WLAN).</p> <p>1 mark for identification and 1 mark for expansion of two of:</p> <ul style="list-style-type: none"> • wireless network card (1) fits inside computer / sends & receives signals (1) • wireless hub / access point / router (1) sends & receives signals from all computers (1) • external wireless antenna (1) plugs into computer / better signal (1). 	[4]
4(b)	<p>Explain why a wireless network could be the most suitable for IEC.</p> <p>Any two of:</p> <ul style="list-style-type: none"> • no need for wiring • computers can be moved around more easily • could give wireless access to customers with laptops • cheaper than cable 	[2]
5(a)	<p>IEC's network will need some new hardware. Describe the function of each of the following types of hardware.</p> <p>proxy server</p> <p>1 mark for identification and 1 mark for expansion of any of:</p> <ul style="list-style-type: none"> • receives requests for web pages (1) from clients (1) • downloads pages from Internet (1) and transfers to client on request (1) • checks the integrity (1) of each page (1) • stores frequently accessed pages (1) for quicker access (1) • adds security (1) filters requests for web pages (1). 	[2]
5(b)	<p>UPS</p> <p>1 mark for identification and 1 mark for expansion of any of:</p> <ul style="list-style-type: none"> • stores enough power (1) to allow a computer to shut down correctly if power cut (1) • protects computer equipment (1) from power surges (1). 	[2]

Question Number	Answer	Max Mark
6	<p>Identify and explain the purpose of two items of hardware required to connect IEC's network to the Internet.</p> <p>Two from: Modem (1st mark): Any two of: to provide an Internet connection point for the IEC network (1) to make the connection between IEC computers and telephone line (1) to convert signals between computer and telephone line (1) to maintain an Internet connection (1).</p> <p>Communications line(1st mark): Any two of: to provide the connection between IEC network and ISP (1) to transfer data (1) to make connection between IEC modem and ISP modem (1).</p> <p>(Broadband) router(1st mark): Any two of: to inspect IP addresses (1) to forward data to correct host on IEC network(1) to store IP addresses for the IEC network (1) to map IP addresses to MAC addresses (1).</p> <p>Microfilter (if telephone used) (1st mark): Any two of: to split transmission frequencies into data and voice(1) to suppress noise on the telephone line (1) to improve the signal (1).</p>	[6]
7	<p>IEC will upload its web pages from its network to the ISP's server so that the pages can be viewed. Describe one feature of each of the following protocols, used for uploading and viewing web pages.</p> <p>One from: FTP 1 mark for identification and 1 mark for expansion of any of:</p> <ul style="list-style-type: none"> • standard for transferring files (1) on a WAN (1) • determines the format of files (1) while being transferred (1) • sends data in blocks (1) with error checking (1). <p>HTTP One from: 1 mark for identification and 1 mark for expansion of any of:</p> <ul style="list-style-type: none"> • standard for transferring web pages (1) on the Internet or an intranet (1) • determines how files are requested (1) by a browser (1) • defines how a file is identified (1) by a URL (1) • has a secure version (1) HTTPS (1). 	[4]

Question Number	Answer	Max Mark
8	<p>Explain how IEC will use the communications log to help solve common data transfer problems.</p> <p>Any four from:</p> <p>identify the date and time when a problem occurred (1) identify all entries where the same problem occurred (1) look for any recurring patterns (1) identify any source address that keeps failing (1) identify any destination address that keeps failing (1) identify any file types that cause problems (1) identify any protocols that cause problems (1) file communication logs for future reference (1) transfer relevant information to a problem log (1).</p>	[4]
9(a)	<p>Customers at IEC will be able to access the Internet. Describe the following Internet services that customers will have available to them.</p> <p>Access to WWW</p> <p>One mark for point and one for expansion of:</p> <ul style="list-style-type: none"> • can open any holiday website(1) from a browser (1) • can click on hyperlinks (1) to find related information (1) • can use search engines (1) to find holidays (1) <p>Data file exchange</p> <ul style="list-style-type: none"> • can upload photographs (1) for storage (1) • can attach files to emails (1) to send to others (1) • can download travel brochures (1) from websites (1) 	[2] [2]
9(b)	<p>Evaluate the consequences to IEC of providing these services for its customers.</p> <p>H 5 – 7 Candidates will show a clear understanding of the question and include a detailed evaluation of the consequences to IEC. Candidates will describe both advantages and disadvantages and will make a detailed conclusion in terms of benefits and costs to the company. The information will be presented in a structured and coherent form. There will be few if any errors in spelling, grammar and punctuation. Technical terms will be used appropriately and correctly.</p> <p>M 3 – 4 Candidates will show an understanding of the question and include explanations of the advantages and disadvantages. Explanations may be limited. Candidates will make a conclusion, this may be limited in scope. The information will be presented in a structured format. There may be occasional errors in spelling, grammar and punctuation. Technical terms will be mainly correct.</p>	

Question Number	Answer	Max Mark
<p>9(b) cont'd</p>	<p>L 1 – 2 Candidates will demonstrate a limited understanding of the question. Information may be a list of general advantages or disadvantages, with no overall conclusion or reference to IEC. Information will be poorly expressed and there will be a limited, if any, use of technical terms.</p> <p>Errors of grammar, punctuation and spelling may be intrusive.</p> <p>0 marks – No response or no response worthy of credit.</p> <p>Responses may include:</p> <p>Advantages:</p> <ul style="list-style-type: none"> • customers will be more likely to spend money in the cafe • customers can give feedback and read reviews of destinations • customers will be more likely to use IEC again • can make deals with holiday companies for customers using IEC to book their own holidays. <p>Disadvantages:</p> <ul style="list-style-type: none"> • needs careful security • customers will need help to use the Internet • may lose some commission sales as customers book their own. <p>Conclusions:</p> <ul style="list-style-type: none"> • increased customer satisfaction, good for company image <p>increased need for IT trained staff, incurs costs.</p>	<p>[7]</p>

Section B		
Question Number	Answer	Max Mark
10(a)	<p>A company develops its own website, which will be hosted by an ISP.</p> <p>Explain how the company will upload the finished website to the ISP's server.</p> <p>Any four of: use ftp software OR web design software to transfer files (1) connect to ISP server OR configure software to find ISP server (1) find area on ISP server to copy files to (1) enter username and password to connect to server (1) copy all web page files to area on ISP server (1) access website through browser to check that everything works correctly (1) close connection when transfer complete (1).</p>	[4]
10(b)(i)	<p>Define the term 'bandwidth'.</p> <p>Any of:</p> <ul style="list-style-type: none"> • number of available frequencies • range of frequencies for transmission • volume of data over time. 	[1]
10(b)(ii)	<p>Describe how bandwidth affects the time it takes for pages to be uploaded.</p> <p>1 mark for point and 1 mark for expansion of either of</p> <ul style="list-style-type: none"> • Higher bandwidth (1) more bits sent at once (1) • More bits at once (1) less time to send whole file (1) • More users sharing bandwidth (1) less speed (1). 	[2]

Question Number	Answer	Max Mark
10(b)(iii)	<p>State the calculation used to estimate the time to transfer a file. mark for</p> <ul style="list-style-type: none"> size of file divided by bandwidth. 	[1]
11	<p>Describe the function of a client in a client-server network. Any two from:</p> <ul style="list-style-type: none"> uses the services of another machine (1) rather than performing functions itself (1) requests file storage/printing/web pages (1) from a dedicated server (1). 	[2]
12	<p>Explain the process of accessing a discussion forum to post a message. Any three of:</p> <p>enter username and password (1) gain entry to discussion forum (1) select a posting in an existing topic OR create a new topic (1) create a new reply or message (1) add text and submit (1) wait for moderation of the message (1) view to check that message has been posted (1).</p>	[3]
13	<p>Identify and justify two health considerations to be taken into account when designing workstations for network users. Any two of:</p> <ul style="list-style-type: none"> height of desks (1) to reduce back problems (1) distance of user from screen(1) to reduce risk of eye strain (1) enough space (1) to reduce stress (1) adequate lighting (1) to reduce risk of eye strain (1) no glare on screen (1) to reduce risk of eye strain (1) ergonomic mouse/keyboard (1) to reduce risk of RSI (1) adjustable chair (1) to reduce back problems (1) 	[2]
14	<p>Explain how computer equipment can be protected from theft. Any three of:</p> <p>lock equipment to desks (1) install equipment alarm devices (1) restrict access to computer rooms (1) use security cameras to monitor computer equipment (1) keep equipment away from public areas (1) keep important equipment in locked rooms (1).</p>	[3]
Paper Total		[100]

Assessment Objectives Grid (includes QWC)

Question	AO1	AO2	AO3	AO4	Total
Task 2	6		6	9	21
Task 3		6	2	1	9
1		2		2	4
2(a)			4		4
2(b)			3		3
3(a)		3			3
3(b)		3			3
4(a)		4			4
4(b)				2	2
5(a)			2		2
5(b)			2		2
6		6			6
7			4		4
8	4				4
9(a)			4		4
9(b)		1		6	7
10(a)	4				4
10(b)	1	3			4
11			2		2
12			3		3
13		2			2
14			3		3
Totals	15	30	35	20	100