



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**INFORMATION AND COMMUNICATION TECHNOLOGY**

**0417/01**

Paper 1 Theory

**For Examination from 2016**

SPECIMEN MARK SCHEME

**2 hours**

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**MAXIMUM MARK: 100**

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The syllabus is accredited for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

- 1 (a) Magnetic Ink Character Reader/Optical Character Reader [1]
- (b) bar code reader [1]
- (c) Optical Mark Reader [1]
- (d) magnetic stripe reader/chip and PIN reader [1]

- 2 bar code reader joystick **laser printer** **multimedia projector**  
 PIN pad scanner temperature sensor touch pad [2]

2 correct circles – 2 marks  
 1 correct circle – 1 mark

- 3
- |   | true | false |
|---|------|-------|
| Computer programs are examples of hardware.             |      | ✓     |
| A Command Line Interface is a form of operating system. | ✓    |       |
| A tablet computer is larger than a desktop computer.    |      | ✓     |
| A compiler is an example of applications software.      |      | ✓     |
- 4 correct answers – 2 marks  
 2 or 3 correct – 1 mark  
 1 correct – 0 marks [2]

- 4
- |        | normal | abnormal | extreme |
|--------|--------|----------|---------|
| 18     | ✓      |          |         |
| 21     |        | ✓        |         |
| twenty |        | ✓        |         |
| 20     |        |          | ✓       |
- [4]

- 5 (a) Any **two** from:  
 – hub  
 – switch  
 – NIC  
 – bridge [2]

(b) router/modem

[1]

(c)

	true	false
Booking a theatre ticket is an example of online processing.	✓	
Producing utility bills is an example of online processing.		✓
An internet browser is used by web designers to test web pages.	✓	
An internet browser uses an inference engine.		✓

4 correct answers – 2 marks

2 or 3 correct – 1 mark

1 correct – 0 marks

[2]

6 Any **three** from:

- surgical and diagnostic aids
- prosthetics and medical products,
- tissue engineering
- artificial blood vessels
- designs of medical tools and equipment

[3]

7 (a) Any **three** from:

- Global Positioning System
- space-based navigation system
- typically four satellites must be visible to the receiver
- calculates the distance from a receiver to the satellite
- calculates the position of the receiver

[3]

(b) Any **two** from:

- used in cars to calculate routes
- used by walkers to locate position on hills/mountains
- used by runners to calculate distance run
- used by farmers for tractor navigation/soil evaluation/livestock control/yield monitoring
- used in satellite navigation systems for ships
- used in tracking aircraft

[2]

8 Any **five** from:

- both can be stored well away from the server...
- ...in the event of fire they will be secure
- tapes are cheaper per bit
- tapes are more compact than a portable hard disk for the same memory
- it is quicker to access lost work using disks
- disks would make it quicker to restore the system
- tapes are less prone to data loss and mechanical failure
- both can store very large amounts of data
- both have very fast data transfer rates

[5]

- 9 (a)** Any **two** from:
- an integrated circuit...
  - ...which contains an aerial...
  - ...which receives and transmits data
- [2]
- (b)** Any **three** from:
- he places his passport against the RFID reader
  - he stands in front of a scanner/fingerprint scanner is used
  - his facial characteristics/fingerprints are compared with...
  - ...those stored on the RFID chip
- [3]
- 10 (a)** Any **three** from:
- either:
- it looks through the cells A2 to B8
  - compares with the contents of E2/BB
- or:
- it reads the contents of E2/BB
  - compares with the contents of A2:B8
  - until it finds the first matching value
  - it records the corresponding value from column 2 of the range A2:B8
  - E2 contains BB
  - produces /records Bed and breakfast
- [3]
- (b)** Flights only
- [1]
- (c)** Any **three** from:
- it looks through the cells B12 to B22
  - it adds the contents of C12 to C22 where...
  - ...the corresponding value of B12 to B22 is equal to E2
  - there are 28 days
- [3]
- (d)** 21
- [1]
- (e)**  $\text{INT}(F2/7)$
- INT (1 mark)  
F2/7 (1 mark)
- [2]
- (f)**  $F2-(G2*7)$
- F2- (1 mark)  
(G2\*7) (1 mark)
- [2]

(g) 1 mark for each correct tick

what ifs	✓
queries	
automatic recalculation	✓
internet browsing	
animation	
data replication	✓
emails	
changing fonts	

[3]

11 Any **four** from:

- ROM cannot be changed
- RAM can be read from and written to
- ROM is read only memory and RAM is random access memory
- ROM holds instructions that need to be unchanged, such as BIOS/program cycles in a washing machine/program instructions in games
- RAM holds the work that is currently being done by the user

[4]

12 (a) 1 mark for each correct answer

Field name	Validation check
Product_name	None
Bar_code	Check digit/length check
Re_order_level	Range check
Last_ordered_date	Range check/format check

[6]

(b) 1 mark for each correct answer

- visual verification/checking
- visual comparison of data entered with source document
- double data entry
- data is typed in twice by one typist/data is typed in by two operators and computer compares versions

[4]

(c) Any **three** from:

- direct changeover – new system replaces existing system immediately/overnight
- parallel running – new system runs alongside/together with existing system
- phased implementation – new system is implemented part by part
- pilot running – system is implemented in one branch/one office (at a time)

[3]

13 (a) Any **four** from:

- data is entered using keyboard/touch screen
- uses interactive interface/asks questions...
- ...based on previous responses
- inference engine compares data
- compares data with that held in the knowledge base...
- ...using rules base
- matches are found
- system suggests probable illnesses

[4]

(b) Any **two** from:

- Car fault diagnosis
- Prospecting
- Tax
- Careers
- Chess games
- Animal/plant classification/identification

[2]

14 1 mark for each correct tick

Robots produce the same standard every time.	✓
Robots don't cost very much to buy.	
Robots don't need programming to perform a task.	
Robots are more accurate.	✓
Workers are no longer employed.	
Robots don't take breaks.	✓
Robots can think for themselves.	
Robots never make mistakes.	

[3]

- 15 LAN uses cables to transmit data whereas a WLAN uses wireless technology to transmit data (1 mark)

**Advantages** (2 marks)

Any **two** from:

- cheaper as less cabling is required
- new workstations can be sited anywhere
- different devices can be connected easily

**Disadvantages** (2 marks)

Any **two** from:

- limited area of network
- strength of signal is weaker
- easier to hack into/less secure
- physical obstacles can interfere with signal/can cause disconnection
- slower data transmission rates

[5]

- 16 (a) 1 mark for each correct answer

physical safety is the need to prevent accidents with computers

e-safety is the need to take sensible precautions when using the internet

[2]

(b) Any **three** from:

- only use websites recommended by teachers
- only use a student friendly search engine
- only email people already known
- think before opening an email from an unknown person
- never email the school's name or a picture in school uniform
- know how to block and report unwanted users in chat rooms
- never give out any personal information online
- never arrange to meet anyone alone
- always tell an adult first and meet in a public place
- never use real name when playing games online

[3]

- 17 Any **six** from:

Positive:

- microprocessor controlled devices do much of the housework
- do not need to do many things manually
- do not need to be in the house when food is cooking
- do not need to be in the house when clothes are being washed
- can leave their home to go shopping/work at any time of the day
- greater social interaction/more family time
- more time to go out/more leisure time/more time to do other things/work
- are able to do other leisure activities when convenient to them
- can encourage a healthy lifestyle because of smart fridges analysing food constituents
- do not have to leave home to get fit

Negative

- can lead to unhealthy eating due to dependency on ready meals
- can lead to laziness/lack of fitness
- microprocessor controlled burglar alarm provides a sense of security
- manual household skills are lost

one mark is available for a reasoned conclusion

[6]

**18 To be marked as a level of response:****Level 3 (7–8 marks):**

Candidates will address both aspects of the question and discuss/consider different advantages/disadvantages. The issues raised will be justified. There will be a reasoned conclusion. The information will be relevant, clear, organised and presented in a structured and coherent format.

**Level 2 (4–6 marks):**

Candidates will address both aspects of the question and discuss/consider different advantages/disadvantages although development of some of the points will be limited to one side of the argument. There will be a conclusion. For the most part the information will be relevant and presented in a structured and coherent format.

**Level 1 (0–3 marks):**

Candidates may only address one side of the argument, and give basic advantages and disadvantages. Answers may be simplistic with little or no relevance.

**Examples of advantages:**

- workers can use own office so documents do not get lost in transit/bulky documents/equipment do not have to be carried around
- company can call meeting at short notice
- company does not have to pay travelling expenses
- company does not have to pay hotel expenses
- company does not have to pay for conference room facilities
- travelling time is saved
- might be dangerous to fly/travel
- disabled people may find it difficult to travel

**Examples of disadvantages:**

- takes time to train employees
- difficult to call international meetings because of time differences
- initial cost of hardware
- equipment can break down
- strength of signal/bandwidth/lipsync can be a problem/connection can be lost/power cuts
- loss of personal/social contact with other workers
- takes time for workers to learn new technology
- cannot sign legal documents

[8]