

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International Advanced Subsidiary and Advanced Level

## **MARK SCHEME for the March 2016 series**

# **9713 APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/32**

Paper 3 (Written Test B), maximum raw mark 80

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1 (a) Six from:

*Benefits:*

No direct calling costs when using VoIP handsets over company network  
 Can be used from smartphone/PC and tablets  
 Can support additional services e.g. Caller ID, anonymous call blocking, call diversion, call waiting, do not disturb, ring back, voicemail  
 Can support encryption of conversations  
 Can support telephone conferences/more than two participants  
 Easily expandable compared to traditional telephone networks  
 Staff can have location independent telephone numbers which are assigned so staff login to services

*Drawbacks:*

Can use too much network resource/bandwidth  
 Data packets can be lost  
 Data packets can arrive in the wrong order/need to be re-sequenced  
 Quality of service can vary/put demands on the network to the detriment of other uses  
 Latency can be a problem – delay in sound/voices  
 ...caused by e.g. packets taking different routes  
 Latency deliberately increased to counter jitter – packets buffered to re-sequence so jitter is introduced  
 Calls can be intercepted more easily than traditional calls so increased need for encryption  
 Support for emergency calls depends on power to the VoIP system being on

*Max 4 for all advantages or all disadvantages.  
 1 mark is available for a reasoned conclusion*

[6]

(b) Six from:

Signal sent from one handset to system to locate/connect to appropriate receiving handset/initiate connection  
 Telephone handset/headset uses microphone to capture voice/sounds  
 Analogue sounds/voices are digitised  
 ...using codec  
 Digital information divided into packets  
 Packets placed into IP packets  
 ...using UDP as no re-transmission of packets is usually possible due to latency  
 Packets transmitted over network  
 ...packet switching  
 Packets travel independently  
 Receiver re-sequences packets  
 Digital data converted back to analogue  
 ...using codec  
 Use of session control/signal protocols  
 ...to set up/end calls

[6]

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**2 (a) Four from:**

A: local address

...used to identify holder of email inbox/used as username of the holder of email inbox

B: domain part of address

...identifies administrative body e.g. the company that owns the address

...used in routing the email to correct address

...looked up against DNS records

...last part can be used to identify the type of company e.g. .com represents a commercial organisation/is a top level domain

@: used to separate local from domain address

Account name cannot be longer than 64 characters and domain name cannot be, practically, longer than 254 characters. **[4]**

**(b) Six from:**

Email written in email client/software/webmail...

...add any required attachments

Subject added to subject bar

Address added to email...

...cc/bcc other recipients

Sets read receipt if required

Email sent to outbox

Use of SMTP/POP3/IMAP protocol(s)

Outbox sends email to email server on network

Email server stores email ready for forwarding

Email server uses domain part of email to look up domain of recipient

Email server send sends email to appropriate domain via routers

...each router uses IP address of domain to direct packets/email

Email arrives at server of domain and may be stored

...recipient server looks up local address

...sends email to inbox of recipient/local address **[6]**

**3 (a) Four from:**

No waiting for delivery

E-ticket cannot be lost/misplaced/damaged

...E-ticket can be reprinted

Less prone to fraud/ e-ticket cannot easily be used by others

Can be used by displaying on smart-phone

...no need to print anything at all

Can carry a barcode/matrix/QR code is all that is needed/contains link to all booking details

Passenger details stored in system so can be retrieved for future use

Physical copy of e-ticket may not actually be required/no need to have physical copy at check-in

...passenger may just need reference code and personal/photo id

Allows check-in online

...enables selection of seats

Allows boarding passes to be printed before arrival at check-in/airport

...reduces delays at airport check-in desks **[4]**

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**(b) Four** from:

- Unique barcode/matrix code on ticket/in email body/attachment
  - ...used to look up passenger details...
  - ...passenger details already stored on system when booking was made
  - ...credit card/passport number/email address
  - Details checked with passenger identification documents
  - ...passenger shows credit card used to purchase tickets/passport
- [4]**

**(c) One** from:

- Sent by email on check-in
  - Sent by text message on check-in
  - Use of airline app/the boarding pass appears within airline app on check-in
- [1]**

**(d) (i) Two** from:

- No need to stop at a kiosk at the airport to print boarding pass
  - No need to use paper/environmentally friendly due to reduced paper use
  - May be more secure due to use of matrix codes/no paper copy
  - Passengers may not have access to a printer
- [2]**

**(ii) One** from:

- Mobile app may not cope with more than one per person per reservation
  - Mobile device may not work/battery may fail on device
  - E-boarding pass may not be readable from the screen of the device
- [1]**

**4 Four** from:

- More possibility of fraud
  - ...personal details can be intercepted during transfer between passenger and booking site
  - ...personal details can be used for identity theft
  - ...financial details can be intercepted during transfer between passenger and booking site
  - ...financial details can be used to purchase goods by third parties
  - ...financial details can be used to transfer/steal funds from bank accounts of passengers
  - Correction of errors on application form for e-ticket may be expensive to correct
- [4]**

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**5 Eight** from:

*Benefits:*

Very secure so passport copying/tampering is more difficult  
 ...chip holds hash (#) code of all files so copying/tampering is difficult  
 Faster clearance at immigration checks  
 ...chip is read/checked quicker by a computer than by a human  
 Automated border clearance at border posts  
 ...fewer border staff required at checkpoints  
 ...greater border protection

*Drawbacks:*

Data transfer by RFID is insecure  
 ...can be read by any appropriate reader in vicinity  
 Electronic passports are more expensive for passenger to buy  
 Extra cost of readers at airports/check-ins  
 Use of biometric data is seen as an invasion of privacy

*Max 6 for all benefits or all drawbacks  
 One mark is available for a reasoned conclusion.*

[8]

**6 (a) (i) Three** from e.g. :

*Advantages:*

All items/goods have a barcode  
 ...reader is required to scan barcodes on items which is quicker than manual entry  
 ...as item is purchased  
 ...to look up item details for customer which is quicker than manual lookup  
 No need to manually type in item details  
 ...so there are fewer data entry errors at checkout/by operator

*Disadvantages:*

Barcode may be unreadable due to damage/missing  
 Item may not be in stock database/may be incorrectly entered in stock database

*Max 2 for all advantages or all disadvantages*

[3]

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(ii) **Three** from e.g. :

*Advantages:*

(Loose) goods sold by weight  
 ...electronic scales required to input weight of goods which is quicker than manual weighing  
 ...to determine total cost of purchase  
 ...(loose) goods have no bar code so scales weigh these quickly  
 Customers can weigh and price goods themselves

*Disadvantages:*

Misidentification of the actual item being weighed can lead to inaccurate pricings  
 Poor calibration of the scales can lead to inaccurate weights/pricings being recorded

*Max 2 for all advantages or all disadvantages*

**[3]**

(iii) **Three** from e.g. :

*Advantages:*

Required to enter barcode number  
 ...if missing/corrupt/unreadable  
 Enter number of goods sold  
 ...if multiples of same items purchased

*Disadvantages:*

Number arrangement favours right-handed individuals  
 Possible repetition of input of numbers as keys close together  
 Possible miss-key of data  
 Two standard layouts exist leading to possible confusion  
 Risk of health issues due to continual tapping of keypad

*Max 2 for all advantages or all disadvantages*

**[3]**

(iv) **Three** from e.g. :

*Advantages:*

Shows details/pictures of items  
 ...when choosing goods with no bar code  
 ...no need to remember all the details/products  
 Can enter details of items  
 ...by touching icons/images of goods  
 ...so data entry is faster  
 Can show many layers of screens  
 ...to show more details/more products  
 Can be considered to be more hygienic as can be cleaned/wiped easier than other hardware  
 Can reduce space on counter/checkout/need for separate keyboard/pad

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*Disadvantages*

Screens can get dirty so become unresponsive/will not work  
 Screens have to be within reach/may not be at optimum distance for viewing  
 If touchscreen crashes/becomes unresponsive then whole system is unusable

*Max 2 for all advantages or all disadvantages*

[3]

**(b) Six from:**

Barcode is read at terminal  
 Barcode used to look up details of product in stock database  
 ...product id field used  
 Number of items sold is sent to database  
 ...number of goods sold deducted from value in field containing number in stock  
 Value in 'number in stock' field compared with value in 're-order' field  
 ...if value in 'number in stock' field is more than value in 're-order' field  
 ...then no action is taken  
 ...if value in 'number in stock' field is equal to/less than value in 're-order' field  
 ...then a new order is automatically generated/printed  
 ...record is flagged to indicate that a re-order has been generated  
 ...order for replacement goods sent to warehouse computer system

[6]

**7 Eight from:**

*Advantages:*

No need to stock large quantities of goods that do not sell quickly  
 Reduced costs of storage facilities on site  
 Less space needed for storing goods  
 ...more space to display/sell goods  
 Goods always new/fresh  
 Reduced need for warehouse staff on site  
 ...less cost  
 Can react to demand instead of anticipating change in demand for goods

*Disadvantages:*

More frequent deliveries needed  
 ...increased traffic/pollution  
 Cannot take advantage of bulk discounts for very large orders  
 Delays in deliveries will mean empty shelves  
 ...dissatisfied customers

*Max 6 for all advantages or all disadvantages  
 1 mark is available for a reasoned conclusion.*

[8]

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**8 Eight** from:

*Benefits:*

Supermarket gets exact software for its needs  
 Software will work exactly as required by supermarket  
 Software has the features specifically for the supermarket needs  
 Software does not have features which might distract the user/are not needed  
 Owning the rights to software code means supermarket does not have to share with competitor  
 Do not have on-going licencing/upgrade costs  
 Software will work with current systems

*Drawbacks:*

Can take a long time to develop  
 Costs more than off-the-shelf software because development costs are not shared  
 Need to employ a software company/team of software developers to write it  
 Limited help available  
 ...no internet forums or websites  
 Need to provide employee training/cost of training  
 If software development company goes out of business then need to redo software at greater cost

*Max 6 for all benefits or all drawbacks*

**[8]**