MARK SCHEME for the October/November 2013 series

9713 APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY

9713/32 Paper 3 (Written B), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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1 (a) (i) Four descriptions of benefits from:
Any designer can access the design from anywhere/other offices so designs can be created more quickly/reviewed
Designs are easily edited/altered so no need to redraw
Designs are accurate/precise with no human errors
Use of libraries of shapes/items so no need to redraw
Accurate measurements on drawings for use in e.g. cost analysis
Assist in calculating costs for production runs
Can be used to output to 3D printers to print models/prototypes   [4]

(ii) One Input device from e.g.:
Scanner to input/capture images of drawings
Light pen to draw shapes on screen
Tracker ball to move pointer
Graphics tablet to draw shapes/designs

One output device from e.g.:
Graph plotter to produce hard copy of designs
High resolution screen (e.g. LCD) to display drawings/designs
3D printer to produce model/scale model of design   [4]

(b) Six from:
Uses critical path method/Gantt/PERT charts finding optimum time to be spent on individual stages/find end date
Critical path specifies the order in which tasks must be completed
PERT charts specifies the order in which tasks are completed
Gantt charts help to show progress of individual tasks
Event chain diagrams for visualising multiple events
Software helps identify progress made in each task
Software helps with daily and weekly planning
Identifying progress/lack of progress helps with planning future tasks/Milestones identified such as module completion
Some tasks can be done in parallel such as work on different modules
Other tasks must be done in sequence such as linking modules
Number of workers/cost of each stage identified - to monitor cost/organise work force
Use of alarms if stage is late and warning director/ project manager report progress at suitable intervals
Use of calendar software plus appropriate use   [6]

2 (a) (i) Two from:
Voice over Internet Protocol
Use of computer networks
Other Internet services are compatible e.g. file exchange and audio conferencing
to carry voice/audio conversations
Can be computer-based or connected to ordinary telephones
Allows automatic routing of calls/answering services   [2]

    (ii) Four from:

Can originate from computers/PC/laptops

Telephone number stays with computer/laptop so same number wherever user is in world

Telephone numbers are independent of location so no need to store/use different numbers

Internet phones are portable and can be used anywhere there is broadband connection

Calls can effectively be free

Call forwarding/call waiting/voicemail/caller ID and three-way calling are available

Can have multiple users/two or more participants/ conference calls

Can use existing PCs/network instead of dedicated telephone system

Use of computer networks/internet so cost can be/is free   [4]

(b) Four from:

Compresses audio and video from microphone/webcam

Noise cancellation prevents unwanted audio elements

Uses a codec for compression

Compression ratio can be very high/100s to 1

Codec converts audio/video into digital bit stream

Audio and video but stream converted into data packets for transmission over internet

Keeps audio and video synchronised

Use of large screen divided into sections   [4]

(c) Four from:

Introduction of high speed communication systems

Introduction of high bandwidth communication systems

Introduction of high performance computer technology

Increased costs of flying/fuel/taxes on flying

Increased awareness of environmental issues so less willing to travel

Increased costs of venues

Increased fear of terrorism so less travel

Company has gone global/globalisation of company so workers all over world   [4]

3 (a) Two from:
All items/goods/tools bar coded
Use of RFID tags
Bar code/ RFID scanners at point of sale as items/goods sold   [2]

(b) Eight from:
Bar code/ RFID scanners at goods-out/sales area read barcode/tag
Database with items/goods details referenced by bar code/RFID and stock levels and pre-set re-order level
As bar code/RFID scanned data sent to computer with database
Item/goods looked up
If sold number deducted from relevant field/stock level field
If goods arriving, number added to relevant field/stock level field
If number in stock reaches/less than pre-set re-order level alert/message/automatic re-order sent
Re-order level changes when goods sold in great quantities
Fields include e.g.:
Bar code
Number in stock
Item name
Location in warehouse
Re-order level
Supplier ID
Supplier name

4 (a) Two from:
Storage of company files/data/web site
Allow access/login by staff using remote devices on network/from internet   [2]

(b) Two from:
Connect networks into company LAN and to WAN
Using IP packets to direct computer data to required destination computer of employee
Provide low level addressing via MAC address   [2]

(c) Two from:
Interface between network cable and computer
Prepare and send network traffic
Receive network traffic and pass it to computer   [2]

(d) Two from:
provide Wifi
allow staff use of portable devices/laptops/mobile or cell phones to connect to network   [2]

(e) Two from:
Provide secure/private transmission of company data between remote locations
Provide tunnelling using routing protocols to connect company sites together   [2]

5 Four from, e.g.:
FTP/ file transfer protocol
   to upload data to website

HTTP/ hypertext transfer protocol
   for viewing/displaying content of webpages

HTTPS/ hypertext transfer protocol <u>secure</u>
   for secure transactions/data transfer between web pages

SSH/ secure shell
   to log into remote computers and manage them/execute commands

Telnet to allow remote access for maintenance/configuration of servers

TCP/IP Transfer Control Protocol/Internet Protocol
   provides end-to-end connectivity specifying how data should be formatted for transmission/addressed/transmitted/ routed/received at destination

POP3/ Post Office Protocol ver.3
   used by email clients to transfer email using TCP/IP

IMAP/ Internet Message Access Protocol
   transfer of email over SSL

Accept other valid protocols [8]

6 (a) Four from:
   Use of sensors, two example sensors such as infra-red (sensors) to detect warmer areas/clouds/fires used for height determination/movements/visible light (sensors) to detect cloud formations/pollution, to collect data/take measurements
   Data sent to computer system
   Data converted from analogue to digital with appropriate reason e.g. computers cannot read analogue data
   Computer reads/ data into memory/onto storage device
   Use of weather balloons
   Use of weather satellites [4]

(b) Three from:
   Analysis of data using formulas/functions/statistical functions
   Data transferred into appropriate software/example software
   Graphs/charts drawn to show trends
   Tables to show data
   Moving/animated presentation for use on TV [3]

7 (a) Four from:
TV signal from studio sent to uplink dish station by high capacity circuit/microwave/fibre-optic cable
Signal uplinked to geostationary satellite
Change of frequency from uplink to downlink
Signal sent from satellite transponder to viewer's dish
Line of sight
LNB on dish collects signals from satellite
Cable downlink to receiver box
Satellite decoder/set top box processes signals for use by TV [4]

(b) Three from:
May be wrong TV system e.g. analogue v. digital/PAL v. NTSC/SECAM or high definition v. standard definition
TV channel is scrambled/encrypted and needs a viewing card to decode/decrypt it for viewing
Channel is not subscribed to by viewer
Viewing card has not been authorised by provider for use in that particular receiver
TV not switched on/not connected [3]

8 (a) Max three marks with:

Max two from:
Computer program/code/application/script/software
    Can replicate itself
    Can send itself/copies to other computer systems/devices

Max two from:
Can delete files
Can edit/amend files
Can replace system files to slow computer/alter behaviour of computer

Must answer both parts of the question to score full marks [3]

(b) Four from:
Scan computer's disks/memory
Monitor computer ports
    for filenames that match those is a database of viruses
    for suspicious activity by software/applications
scan files for suspicious code [4]

(c) Three from e.g.:
Receive/play FM/AM/DAB radio stations that play music
Play digital/MP3 files using a media player
Play CDs/DVDs using a media player
Receive/play streaming audio from a media server
Receive/play streaming audio from the internet

Allow other suitable media sources [3]

[Total: 80]