

**MARK SCHEME for the May/June 2010 question paper
for the guidance of teachers**

7010 COMPUTER STUDIES

7010/12

Paper 12, maximum raw mark 100

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1 (a) buffer

Any **two** points from:

- temporary ...
- ... storage/memory
- compensates for the difference in speed of peripherals and CPU
- e.g. printer (buffer)

[2]

(b) batch processing

Any **two** points from:

- processing doesn't start until **all** data is collected
- JCL (any *reference to Job Control Language*)
- no need for user interaction
- processed all in one go
- done at "quiet" times
- e.g. billing, payroll, cheque processing

[2]

(c) e-commerce

Any **two** points from:

- electronic commerce
- buying and selling products/services
- using the internet/computer networks
- reference to B2B (business to business) or B2C (business to consumer/customer)
- e.g. on-line shopping, commodity exchanges, Internet/online banking

[2]

(d) simulation

Any **two** points from:

- studying the behaviour of a system
- by using a model/mathematical representation
- results can be predicted
- e.g. flight (or other) simulator, modelling hazardous chemical processes
- e.g. 10-pin bowling computer game

[2]

(e) email

Any **two** points from:

- electronic mail
- sending messages from one device to another using computer networks/Internet
- world wide form of electronic communication
- can send file attachments
- e.g. sending a letter without use of traditional mail service

[2]

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- 2 (a)** Any **three** points from:
- loss of jobs/unemployment
 - deskilling
 - need to re-train
 - different jobs available/re-skilling
 - no longer need to do hazardous/tedious jobs
- [3]
- (b)** Any **two** points from:
- lower work force costs (no salaries to pay)
 - lower environmental costs (less electricity for heating/lighting)
 - higher throughput
 - more consistent product
 - robots don't need breaks, holidays/work 24/7 etc.
 - robots don't take industrial action
- [2]
- (c)** Any **one** point from:
- tasks repeated by skilled worker and how each task is done is memorised
 - tasks programmed directly into the computer/robot memory
- [1]
- (d)** Any **one** point from:
- if parts missing for a sequence, then a warning should be given and the assembly stopped
 - several quality control stages to spot an error early on
 - program in checks at each stage of assembly so robots can detect a fault immediately
- [1]
- 3** Any **four** points from:
- understand the current system
 - produce data flow diagrams/system flowchart
 - identify user/client requirements/objectives
 - interpret user/client requirements/objectives
 - agree requirements/objectives with the user/client
 - collect data from the current system
 - fact finding (e.g. questionnaires, interviewing, etc.)
 - problem identification
- [4]
- 4** Any **four** features from:
- data must be up to date
 - data can only be read/used for the purpose for which it was collected
 - data must be adequate, relevant and not excessive
 - data must be accurate
 - data must be destroyed when no longer needed/don't keep longer than necessary
 - data user must register what data stored
 - data must be used/collected fairly and lawfully
 - data must be held securely
 - data must be protected from accidental damage
 - only authorised personnel can have access to the data
 - fines are imposed for data mis-use
 - data should not be passed on to a third party without permission
 - a person can view data and have it changed/removed if incorrect
 - safe harbour (countries with DPA at least as good)
- [4]

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- 5 (a) 1 mark each for 2 concerns
OR 1 mark for concern + 1 mark for expansion:
- customer goes online in a public place
..... and is overlooked as they enter id/password/PIN
 - customer receives emails taking them to a false site
..... where they are asked to confirm details by entering them
 - customer downloads virus, spyware,
..... which logs all key presses including id/password/PIN [2]
- (b) Any **two** points from:
- don't need card number for online transaction/card number already
 - online user is anonymous/not visible
 - online the customer does not need the card and signature/PIN [2]
- (c) Any **two** points from:
- secure sites using encryption
 - use of passwords/PINs/biometrics/advice to change PIN regularly
 - no communications with customer requiring personal details
 - use of home card readers that generate codes known only to bank and customer
 - check with customer at each log on when they were **last** logged on to the website
 - contact customer if unusual transaction/random check
 - customer asked to inform bank if intending to use card in another country
 - customer asked to inform bank if card lost/stolen
 - ensure firewall is in place [2]
- 6 (a) Any **four** points from e.g.:
- gather information from experts/questionnaires
 - create the knowledge base
 - type/put information into computer
 - create rules/rules base
 - create/design inference engine
 - create/design input–output interface
 - fully test the system
 - expert system learns [4]
- (b) (i) Any **one** point from:
- 3D visual world
 - uses computer simulation
 - uses special interface devices (e.g. data gloves and goggles) [1]
- (ii) Any **one** point from:
- data gloves/goggles (if not given credit in part (i))
 - hardware/motors to provide movement
 - special suits fitted with sensors [1]

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- 7 (a) Any **four** improvements from:
- use (text) boxes for
 - *names*
 - *addresses*
 - *sex*
 - *date of birth*
 - *subjects*
 - *grades*
 - separate fields into separate entry items
 - *name* into *first name* and *last name*
 - *address* into *street, city* etc
 - drop down list/combo box for
 - *date of birth*
 - *sex*
 - *subjects*
 - *grades*
 - calendar object for
 - *date of birth*
 - radio buttons for
 - *sex*
 - hyperlinks for
 - *NEXT*
 - *BACK*
- [4]

- (b) (i) **any one** point from:
- check on input for errors by double entry
 - on screen checking
 - check input is same as source
- (ii) – name
- address
- [3]

- 8 (a) Any **two** points from:
- barcode is scanned/keyed in
 - barcode is validated (by check digit)
 - system looks up barcode in computer files/database
 - retrieves (and returns) price
- [2]

(b)

<i>if stock level < minimum stock level</i>	3
<i>report printed out for manager</i>	5
<i>stock level reduced by 1</i>	1
<i>new stock value written back to file</i>	2
<i>more items are ordered automatically</i>	4

- 1 mark for each correct answer up to max of 4.
 4 marks for **all** 5 correct
 3 marks for **any** 3 or 4 correct
 2 marks for **any** 2 correct
 1 mark for **any** 1 correct
- [4]

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9 (a) Any **two** correct input devices
OR input device + correct type of screen

- mouse/trackerball + CRT screen/TFT screen
- touch screen + CRT screen/TFT screen
- light pen + CRT screen

[2]

(b) **Dot matrix printer:**

Accept a max of 2 advantages **and** a max of 2 disadvantages:

Advantages:

- suitable for dirty/dusty/damp atmospheres
- cheap to maintain
- cheap to run
- can operate with continuous/multipart stationery

Disadvantages:

- poor print quality
- very noisy
- very limited colours

[3]

Inkjet printer:

Accept a max of 2 advantages **and** a max of 2 disadvantages:

Advantages:

- inexpensive to purchase
- high quality printouts
- can use colours
- supported by most operating systems
- quiet

Disadvantages:

- run out of printing ink quickly/cartridges run out quickly
- price per page/inks are expensive
- not suitable for dirty/dusty/damp atmospheres

[3]

10 (a) Award marks as shown (each block = 1 mark):

	D	E
1	Total cost (\$)	Average cost per month (\$)
2	= B2 * C2	= D2 / 5
3	= B3 * C3	= D3 / 5
4	= B4 * C4	= D4 / 5
5	= B5 * C5	= D5 / 5
6	= B6 * C6	= D6 / 5
7	= B7 * C7	= D7 / 5
8	= AVERAGE (D2 : D7) Alternative answers: = SUM(D2:D7)/6 = (D2+D3+D4+D5+D6+D7)/6	= AVERAGE (E2 : E7) Alternative answers: = SUM(E2:E7)/6 = (E2+E3+E4+E5+E6+E7)/6 = D8/5

[4]

(b) (i) (A1 : A7) and (C1 : C7)
(1 mark) (1 mark)

[2]

(ii) Any **one** point from:

- add an extra column and set all values to 2.08
- draw a line at value 2.08 on the graph
- add a trend/average line using spreadsheet software

[1]

(c) D6, E6, C8, D8, E8 (-1 mark for each error or omission)

[2]

11 (a) E, H

[2]

(b) (Engine (litres) > 1.8) OR (CO₂ (g/km) > 150)
← (1 mark) → ← (1 mark) →

Or

(CO₂ (g/km) > 150) OR (Engine (litres) > 1.8)
← (1 mark) → ← (1 mark) →

[2]

(c) G, C, D, B, F, A, E, H
(1 mark for correct order (fuel used)
1 mark for *ascending* order)

[2]

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- 12 (a) Any **two** items from:
- webcams/digital video camera
 - microphones
 - broadband modem
 - networking hardware e.g. cabling/router
 - loud speakers/headphones
- [2]
- (b) Any **two** items from:
- communications software
 - CODEC/compression software
 - Internet access software
 - driver software (for the hardware in part (a))
 - echo cancellation software
- [2]
- (c) Any **two** problems from:
- poor reception (poor sound, jerky screen images)/network failure
 - if more than 2 conference locations, can be difficult controlling meeting
 - time zones
 - language difficulties
 - power failure
- [2]
- 13 Expected output:
- 1
2
Error
- [3]
- 14 (a) Any **one** from:
- infra-red
 - light
 - radar
 - ultrasonic / proximity
- [1]
- (b) Any **four** points from:
- signal sent out from vehicle **A**
 - sensors pick up reflected beam
 - signal converted to digital by ADC
 - computer uses data to calculate how close vehicle **B** is
 - computer uses speed of vehicle **A**
 - to determine the **safe distance**
 - if the **safe distance** > distance between the two vehicles
 - then the driver is warned
 - sends signal to (actuators) apply brakes
 - *reference to need for DAC*
 - monitoring continues endlessly unless system deactivated
 - * *no marks for computer applies the brakes*
 - * *no marks for computer senses*
 - * *no marks for sensor taking any actions*
- [4]

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(c) Any **two** points from:

- when roads are busy, constantly braking
- system may not take road conditions into consideration
- over-reliance on system by the driver
- only works properly if vehicle has an automatic gearbox
- sensors don't work if obstructed/dirty/malfunction

[2]

15 *LEFT 90*
PENDOWN
FORWARD 10
RIGHT 90

FORWARD 10
PENUP
FORWARD 10
PENDOWN

FORWARD 20
RIGHT 90
FORWARD 20
RIGHT 90
FORWARD 20

LEFT 90
FORWARD 20
PENUP / RIGHT 90

20 RIGHT 90/PENUP
FORWARD 10
PENDOWN

FORWARD 10
RIGHT 90
FORWARD

(NOTE: the second sequence of instructions could be done with a REPEAT loop i.e. REPEAT 2
FORWARD 20
RIGHT 90
ENDREPEAT
FORWARD 20

It is also possible to write:

REPEAT 3
FORWARD 20
RIGHT 90
ENDREPEAT

followed by LEFT 180 or RIGHT 180 instead of LEFT 90)

[5]

16 (a) total = 0 (1 mark) *initialisation*
for x = 1 **to** 50 (1 mark) *correct loop*
 input number (1 mark) *correct input **and** output*
 if number > 100 **then** total = total + 1 (1 mark) *count numbers>100*
next x

output total

(1 mark for initialising total)
(1 mark for correct loop – accept **repeat** loop or a **while** loop)
(1 mark for correct input (within loop) **and** output (after the loop))
(1 mark for counting how many input numbers were > 100)

[3]

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(b) total = 0 (1 mark) *initialise total*

for x = 1 to 100 (1 mark) *correct loop*

input number (1 mark) *correct input **and** output*

total = total + number (1 mark) *finding sum of numbers*

next x

average = total/100 (1 mark) *calculate average*

output average

(1 mark for initialising total)

(1 mark for correct loop – accept **repeat** loop or a **while** loop)

(1 mark for correct input (inside the loop) **and** output (after the loop))

(1 mark for calculating total)

(1 mark for calculating the average outside the loop)

[3]