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Cambridge International Advanced Level

MARK SCHEME for the May/June 2015 series

9608 COMPUTER SCIENCE

9608/33 Paper 3 (Written Paper), maximum raw mark 75

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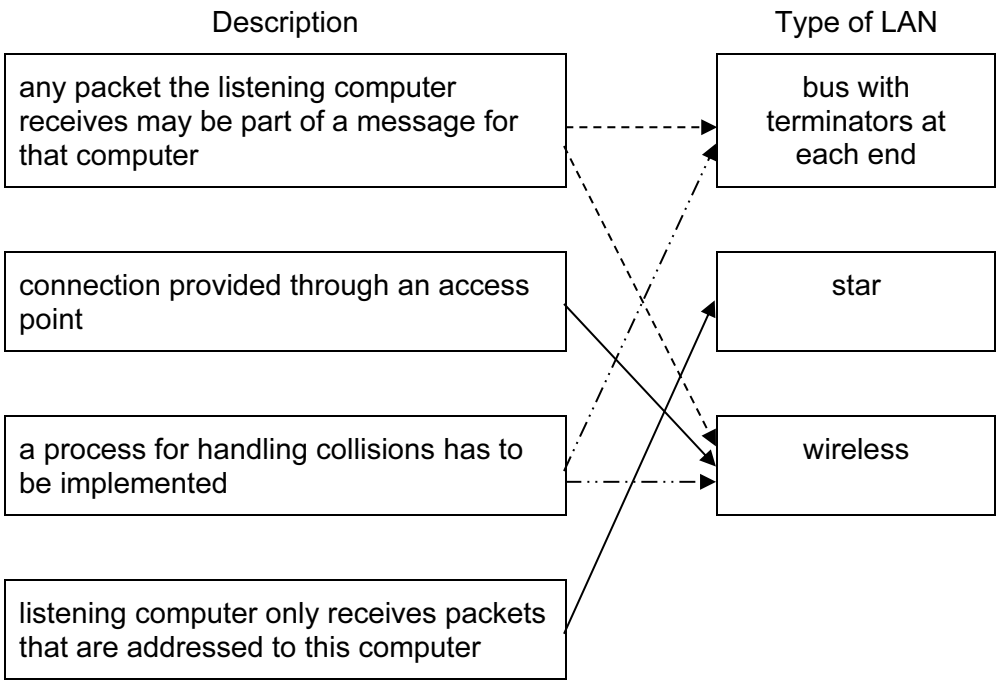
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1 (a) (i)	Wrong assignment operator (should be ':=' not '=')	1
(ii)	0 is not a digit	1
(iii)	'B' is not a number	1
(b)	<assignmentstatement> ::= <variable> := <variable><operator><number> <variable> ::= <letter><number> <number> ::= <digit> | <digit><number> <letter> ::= A|B|C <digit> ::= 1|2|3|4|5 <operator> ::= +|-|*|/	1 + 1 1 1 + 1 1
(c) (i)	Use of software … (idea of using) to implement a hardware set-up (idea of implementing / simulating / emulating)	1 1
(ii)	e.g. no need to acquire client hardware for testing / reduces set-up time for test system / common development system for all developers	1
(iii)	e.g. software emulation runs slower than real hardware / not possible to emulate some hardware	1
		Total: 13
2 (a)	 1 mark for correct arrow(s) from each description	1 1 1 1
(b) (i)	**Server**: central computer stores files that are to be downloaded	1 1

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(ii)	**Command**: user can send action/instruction (or by example, e.g. change directory) that are carried out on server	1 1
(iii)	**Anonymous**: allows user to access files user does not need to identify themselves to server	1 1
		Total: 10
3 (a)	A Phishing B Virus C a standalone piece of software which can reproduce itself automatically D sending unsolicited emails to a distribution list	1 1 1 1
(b)	e.g. phishing **problem**: identity fraud / misuse of financial data **solution**: ignore email / don't respond to email e.g. virus **problem**: computer may stop working // lost files **solution**: running anti-virus software	 1 1 **or** 1 1
(c)	**cipher text**: encrypted text which is not understandable **private key**: key only known to owner that can be used to encrypt message to confirm author of message // can be used by owner to decrypt a message thereby ensuring only owner can read message	1 1
(d)	• Manager encrypts email • using public key of colleague • colleague decrypts email • using his/her private key	1 1 1 1
		Total: 12
4 (a) (i)	`HomeAddress.ThisHouseNo ← 34`	1

(ii)	`DECLARE ThisHouseNo: 1..10`
	
	`DECLARE ThisTown: [Brightown, Arunde, Shoram]`
		1
		
		1

(b) (i)	`TYPE WeatherStation`
	`  DECLARE StationID : STRING`
	`  DECLARE Latitude : REAL`
	`  DECLARE Temperature : ARRAY[1..15] OF INTEGER`
	`ENDTYPE`
		
		1
		1
		1 + 1
		1

(ii)	`StationID` is hashed to produce home location If home location is free insert record Else use overflow method to find free location	1 1 1
		Total: 11

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5 (a) (i)

Circuit 1		
A	B	X
0	0	**1**
0	1	**0**
1	0	**0**
1	1	**0**

1

(ii)

Circuit 2		
A	B	X
0	0	**1**
0	1	**0**
1	0	**0**
1	1	**0**

1

(b) (i)

circuit 1 $\overline{A+B}$ — 1
circuit 2 $\overline{A}\,.\,\overline{B}$ — 1

(ii)

$\overline{A+B} \equiv \overline{A}\,.\,\overline{B}$ — 1

(c)

$\overline{\overline{(A.B)}+B}$

mark as :

$\overline{(A.B)}$ — 1
$+B$ — 1
bar over whole expression — 1

(d)

$\overline{\overline{(A.B)}+B}$
$= \overline{\overline{(A.B)}}\,.\,\overline{B}$ — 1
$= (A.B).\overline{B}$ — 1
$= A.(B.\overline{B})$ — 1
$= A.0$ — 1
$= 0$ — 1

allow f.t. from (c) — max 3

Total: 11

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6 (a)	Control system	1
(b)	Any three different items – max 6 marks heater / water pump / blinds pump … for altering temperature / watering / light level actuator for… fan for distributing air / water pump / blinds motor analogue to digital converter / digital to analogue convertor … converts analogue signal from sensor to digital value for processing / converts digital signal to analogue signal for controlling actuator microprocessor … executes control software warning device (speaker/buzzer/light)… to give warning if conditions out of range / hardware malfunction	 1 1 1 1 1 1 1 1 1 1 max 6
(c) (i)	output of system (alter temperature / light level / soil moisture) affects input from sensors continuous	 3
(ii)	min / max / ideal / mean / extreme temperature // sampling rate // tolerance interval	1
(iii)	reading from sensor is compared with parameter appropriate action is taken (by example)	 2
(d) (i)	reading available for processing reading value is 4	1 1
(ii)	`AND #B00000100 // AND #&04 // AND #4` 1 mark for `AND`, 1 mark for address mode, 1 mark for mask, 1 mark for indication of numbering system	 max 3
		Total: 18

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