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**APPLIED INFORMATION & COMMUNICATION TECHNOLOGY**

**9713/02**

Paper 2 Practical Test A

**May/June 2017**

MARK SCHEME

Maximum Mark: 120

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**Published**

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.

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This document consists of **20** printed pages.

## Evidence Document

Evidence document	
Header – name and numbers	1 mark

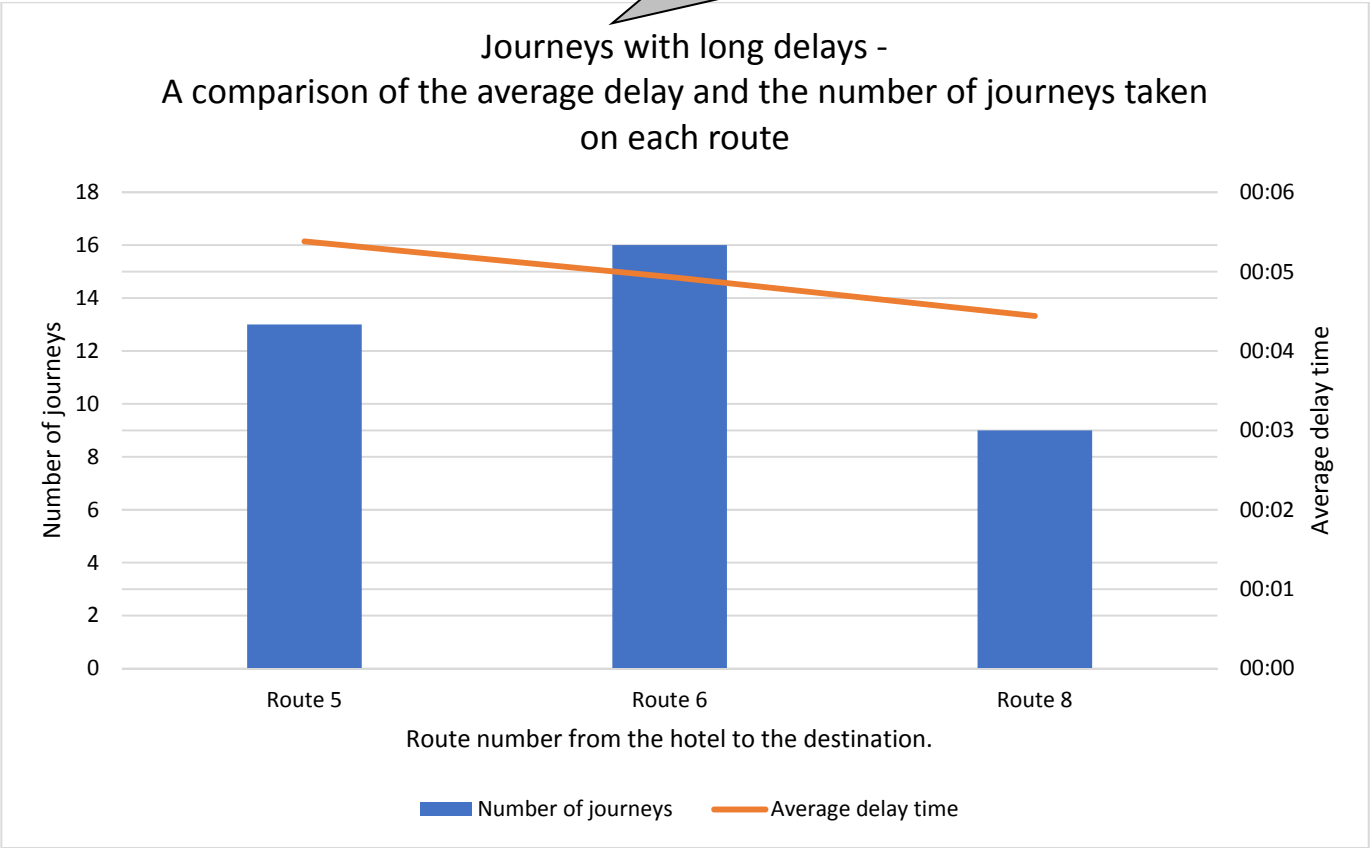
Q2

<b>Formatting</b>	
5 rows inserted	1 mark
<b>Row 1</b>	
Cells A1-H1 Merged	1 mark
Cansaulim Beach Hotel 100% in sans serif font	1 mark
White with black background	1 mark
<b>Row 2</b>	
Grey background, sans serif & text 100% & centre aligned	1 mark
<b>Row 3</b>	
Correct text bold	1 mark
4 pairs merged and centre aligned	1 mark
Gridlines on rows 3 and 4	1 mark
<b>Row 5</b>	
$\leq \frac{1}{2}$ height of row 6	1 mark
<b>Row 6</b>	
Bold, left aligned text	1 mark

	A	B	C	D	E	F	G	H
1	<b>Cansaulim Beach Hotel</b>							
2	Mini-bus services - delay analysis							
3	<b>Average delay</b>	<b>Longest delay</b>	<b>Number of delays</b>	<b>Number of long delays</b>				
4								
5								
6	<b>Bus Code</b>	<b>Due</b>	<b>Arrived</b>	<b>Late</b>	<b>Minutes</b>	<b>Bus Route</b>	<b>Capacity</b>	<b>Destination</b>

Q21

<b>Chart</b>	
Search - Average delay > 4	2 marks
Correct count values 13, 16, 9	2 marks
Correct average values 5.4, 4.9, 4.4	2 marks
Chart type	2 marks
<b>Category Axis</b>	
Route no. or Destination names in full	1 mark
Meaningful and appropriate axis label	1 mark
<b>Value Axes</b>	
2 shown	1 mark
Appropriate axis labels (1 mark / label)	2 marks
Average delay axis recalibrated to full minutes	2 marks
Chart title – Meaningful and appropriate	1 mark
Chart title – of appropriate size	1 mark
Series labels – both correct & appropriate	2 marks



Q25

**Data validation**

Decimal value selected		1 mark
Between	$\geq 0.005$	1 mark
0.005	AND	1 mark
0.05	$\leq 0.05$	1 mark

Data Validation

Settings   Input Message   Error Alert

Validation criteria

Allow:  
Decimal   ☒ Ignore blank

Data:  
between

Minimum:  
0.005

Maximum:  
0.05

☐ Apply these changes to all other cells with the same settings

Clear All   OK   Cancel

**Data validation**

Appropriate input message shown	1 mark
---------------------------------	--------

Data Validation

Settings   Input Message   Error Alert

☒ Show input message when cell is selected

When cell is selected, show this input message:

Title:  
\_\_\_\_\_

Input message:  
Please enter the cost per seat per minute late in this cell.

Clear All   OK   Cancel

Data Validation

Settings Input Message **Error Alert**

☒ Show error alert after invalid data is entered

When user enters invalid data, show this error alert:

Style: Stop Title: Invalid data entry

Error message:  
Please enter a new value  
between 0.005 and 0.05 in this  
cell.

Clear All OK Cancel

**Data validation**

Appropriate error message shown

1 mark

Error message includes 0.005 and 0.05

1 mark

**PUBLISHED**

Formulae printed by A Candidate ZZ999 9999

	A	B	C	D	E	F
1	<b>Cansaulim B</b>					
2	<b>Mini-bus services</b>					
3	<b>Average delay</b>		<b>Longest delay</b>		<b>Number of delays</b>	
4	=ROUND(AVERAGEIF(E7:E132,">0"),0)		=MAX(E7:E132)		=COUNTIF(E7:E132,">0")	
6	<b>Bus Code</b>	<b>Duration</b>	<b>Arrived</b>	<b>Late</b>	<b>Minutes</b>	<b>Bus Route</b>
7	2610A1961G	0.4566666667	0.4944444444	=IF(B7>C7,0,C7-B7)	=MINUTE(D7)	=MID(A7,9,1)
8	2610A1831G	0.4033333333	0.4033333333	=IF(B8>C8,0,C8-B8)	=MINUTE(D8)	=MID(A8,9,1)
13	2610A1351V	0.4770833333	0.4770833333	=IF(B13>C13,0,C13-B13)	=MINUTE(D13)	=MID(A13,9,1)
14	2610A1141V	0.3826388888	0.3826388888	=IF(B14>C14,0,C14-B14)	=MINUTE(D14)	=MID(A14,9,1)
15	2610A1641V	0.5097222222	0.5097222222	=IF(B15>C15,0,C15-B15)	=MINUTE(D15)	=MID(A15,9,1)
16	2620T1162K	0.4604166666	0.4652777777	=IF(B16>C16,0,C16-B16)	=MINUTE(D16)	=MID(A16,9,1)
17	2620T1912K	0.4854166666	0.4902777777	=IF(B17>C17,0,C17-B17)	=MINUTE(D17)	=MID(A17,9,1)
18	2620T1272G	0.4798611111	0.4840277777	=IF(B18>C18,0,C18-B18)	=MINUTE(D18)	=MID(A18,9,1)
19	2620T1472V	0.4930555555	0.4972222222	=IF(B19>C19,0,C19-B19)	=MINUTE(D19)	=MID(A19,9,1)
20	2620T1342K	0.4930555555	0.4965277777	=IF(B20>C20,0,C20-B20)	=MINUTE(D20)	=MID(A20,9,1)

**Average delay**

=ROUND( ... ,0)

AVERAGEIF ()

E7:E132

"&gt;0" must be in speech marks

1 mark

1 mark

1 mark

1 mark

**Longest**

=MAX ()

E7:E132

1 mark

1 mark

**Count**

=COUNTIF()

E7:E132

"&gt;0"

1 mark

1 mark

1 mark

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	G	H
1	<b>each Hotel</b>	
2	<b>delay analysis</b>	
3	<b>Number of long delays</b>	
4	=COUNTIF(E7:E132,">=4")	
6	<b>Capacity</b>	<b>Long delays</b>
7	=VLOOKUP(F7*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A8,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
8	=VLOOKUP(F8*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A9,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
9	=VLOOKUP(F9*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A10,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
10	=VLOOKUP(F10*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A11,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
11	=VLOOKUP(F11*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A12,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
12	=VLOOKUP(F12*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A13,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
13	=VLOOKUP(F13*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A14,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
14	=VLOOKUP(F14*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A15,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
15	=VLOOKUP(F15*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A16,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
16	=VLOOKUP(F16*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A17,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
17	=VLOOKUP(F17*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A18,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
18	=VLOOKUP(F18*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A19,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
19	=VLOOKUP(F19*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A20,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
20	=VLOOKUP(F20*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A20,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)

**PUBLISHED**

Formulae printed by A Candidate ZZ999 9999

	A	B	C	D	E	F
1	<b>Cansaulim B</b>					
2	<b>Mini-bus services</b>					
3	<b>Average delay</b>		<b>Longest delay</b>		<b>Number of delays</b>	
4	=ROUND(AVERAGEIF(E7:E132,">0"),0)		=MAX(E7:E132)		=COUNTIF(E7:E132,">0")	
6	<b>Bus Code</b>	<b>Due</b>	<b>Arrived</b>	<b>Late</b>	<b>Minutes</b>	<b>Bus Route</b>
7	2610A1961G	0.491666666666667	0.494444444444444	=IF(B7>C7,0,C7-B7)	=MINUTE(D7)	=MID(A7,9,1)
8	2610A1821G	0.402083333333333	0.404861111111111	=IF(B8>C8,0,C8-B8)	=MINUTE(D8)	=MID(A8,9,1)
9	2610A1251V	0.403472222222222	0.405555555555556	=IF(B9>C9,0,C9-B9)	=MINUTE(D9)	=MID(A9,9,1)
10	2610A1551G	0.503472222222222	0.504861111111111	=IF(B10>C10,0,C10-B10)	=MINUTE(D10)	=MID(A10,9,1)
11	2610A1861V			=IF(B11>C11,0,C11-B11)	=MINUTE(D11)	=MID(A11,9,1)
12	2610A1021G					=MID(A12,9,1)
13	2610A1351V					=MID(A13,9,1)
14	2610A1141V					=MID(A14,9,1)
15	2610A1641V			=IF(B15>C15,0,C15-B15)	=MINUTE(D15)	=MID(A15,9,1)
16	2620T1162K	0.460416666666667	0.465277777777778	=IF(B16>C16,0,C16-B16)	<b>Bus Route</b> MID ( ) A7 ,9 ,1	
17	2620T1912K	0.485416666666667	0.490277777777778	=IF(B17>C17,0,C17-B17)		
18	2620T1272G	0.479861111111111	0.484027777777778	=IF(B18>C18,0,C18-B18)		
19	2620T1472V	0.493055555555556	0.497222222222222	=IF(B19>C19,0,C19-B19)		
20	2620T1342K	0.493055555555556	0.496527777777778	=IF(B20>C20,0,C20-B20)	=MINUTE(D20)	=MID(A20,9,1)

**Late**

= IF ( )

B7&gt;C7

,0

C7-B7

1 mark

1 mark

1 mark

1 mark

**Minutes**

=MINUTE()

D7

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark



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Formulae printed by A Candidate ZZ999 9999

	G	H
1	<b>each Hotel</b>	
2	<b>delay analysis</b>	
3	<b>Number of long delays</b>	
4	=COUNTIF(E7:E132,">=4")	
6	<b>Capacity</b>	<b>Destination</b>
7	=VLOOKUP(F7*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A7,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
8	=VLOOKUP(F8*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A8,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
9	=VLOOKUP(F9*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A9,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
10	=VLOOKUP(F10*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A10,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
11	=VLOOKUP(F11*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A11,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
12	=VLOOKUP(F12*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A12,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
13	=VLOOKUP(F13*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A13,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
14	=VLOOKUP(F14*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A14,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
15	=VLOOKUP(F15*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A15,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
16	=VLOOKUP(F16*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A16,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
17	=VLOOKUP(F17*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A17,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
18	=VLOOKUP(F18*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A18,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
19	=VLOOKUP(F19*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A19,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)
20	=VLOOKUP(F20*1,j17seats.csv!\$A\$2:\$B\$10,2,FALSE)	=VLOOKUP(MID(A20,5,1),j17destination.csv!\$A\$1:\$B\$7,2,0)

**Capacity**

=VLOOKUP( )

F7\*1 (or other function to turn into a number)

,SEATS.csv (must be this file with csv extension)

!\$A\$2:\$B\$10

,2

,FALSE or ,0

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

**Destination**

=VLOOKUP()

MID(A7,5,1)

,destination.csv

!\$A\$1:\$B\$7

,2

,FALSE or ,0

Correct replication – all 5 columns

All formulae and labels fully visible

Landscape orientation

Row and column headings visible

Print area set A1 – I20 (extra column)

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

1 mark

**Header**

Formulae printed by: &amp; candidate details

1 mark

**PUBLISHED**

Lunchtime journeys - printed by A Candidate ZZ999 9999

	A	B	C	D	E	F	G	
1	<b>Cansaulim Beach Hotel</b>							
2	<b>Mini-bus services - delay analysis</b>							
3	<b>Average delay</b>		<b>Longest delay</b>		<b>Number of delays</b>		<b>Number</b>	
4	5		25		95			
6	<b>Bus Code</b>	<b>Due</b>	<b>Arrived</b>	<b>Late</b>	<b>Minutes</b>	<b>Bus Route</b>	<b>Capacity</b>	<b>Destination</b>
10	2610A1551G	12:05	12:07	00:02	2	1	15	Airport
15	2610A1641V	12:14	12:14	00:00	0	1	15	Airport
55	2630M1443V	12:23	12:23	00:00	0	3	15	Shopping centre
58	2630M1953G	12:27	12:27	00:00	0	3	15	Shopping centre
66	2640C1744G	12:11	12:11	00:00	0	4	18	Chilean restaurant
73	2650T1655K	12:01	12:05	00:04	4	5	32	Elephant sanctuary
76	2650T1155K	12:04	12:06	00:02	2	5	32	Elephant sanctuary
91	2660D1896G	12:29	12:32	00:03	3	6	16	Cansaulim village centre
101	2670S1497G	12:30	12:36	00:06	6	7	53	Spice farm
103	2670S1637G	12:00	12:05	00:05	5	7	53	Spice farm
107	2670S1007K	12:11	12:12	00:01	1	7	53	Spice farm
113	2670S2097K	12:19	12:19	00:00	0	7	53	Spice farm
117	2680A7168K	12:03	12:09	00:06	6	8	12	Airport

**Header**

Lunchtime journeys – printed by: and cand. details 1 mark

**Formatting**

Row 4 – integer 1 mark

Other rows consistent formatting 1 mark

**Sorting**

Ascending on Bus route then descending on Minutes

1 mark

**Searching – 13 records**

Due &gt;=12:00 1 mark

and &lt;=12:30 1 mark

**Single page**

1 mark

**All visible**

1 mark

**PUBLISHED**

Long delays by route – printed by: A Candidate ZZ999 9999

Number of buses with a long delay								
Route 1	Route 2	Route 3	Route 4	Route 5	Route 6	Route 7	Route 8	Route 9
2	10	7	2	6	8	7	5	3

**Header**

Long delays by route – printed by: and cand. details 1 mark

**Values**

Values as shown: –1 per error or omission 3 marks

Single page and fully visible 1 mark

**PUBLISHED**

Long delays by route – printed by: A Candidate ZZ999 9999

	A
1	
2	Route 1
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!A2,1))

Long delays by route – printed by: A Candidate ZZ999 9999

	B
1	
2	Route 2
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!B2,1))

Long delays by route – printed by: A Candidate ZZ999 9999

	C
1	
2	Route 3
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!C2,1))

Long delays by route – printed by: A Candidate ZZ999 9999

	D
1	
2	Route 4
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!D2,1))

**Formulae**

=COUNTIFS(...)	2 marks
Reference to second worksheet	1 mark
!\$E\$7:\$E\$132	1 mark
Absolute referencing	1 mark
,">3" or ,">=4"	1 mark
, Reference to second worksheet	1 mark
!\$F\$7:\$F\$132	1 mark
,RIGHT( ) or MID( )	1 mark
Relative reference to cell above (probably A2)	1 mark
,1 or ,7,1	1 mark
Landscape with all formulae and labels fully visible	1 mark
Row and column headings visible	1 mark

Long delays by route – printed by: A Candidate ZZ999 9999

	E
1	<b>Number of buses with a long delay</b>
2	Route 5
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!E2,1))

Long delays by route – printed by: A Candidate ZZ999 9999

	F
1	
2	Route 6
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!F2,1))

Long delays by route – printed by: A Candidate ZZ999 9999

	G
1	
2	Route 7
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!G2,1))

Long delays by route – printed by: A Candidate ZZ999 9999

	H
1	
2	Route 8
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!H2,1))

**PUBLISHED**

Long delays by route – printed by: A Candidate ZZ999 9999

	I
1	
2	Route 9
3	=COUNTIFS(BUS!\$E\$7:\$E\$132,">3",BUS!\$F\$7:\$F\$132,RIGHT(Extract!I2,1))

**PUBLISHED**

A Candidate Z999 9999

	A	B	C	D	E
1					
2					
3	<b>Cost per minute per seat:</b>	<b>0.0213</b>			
4					
5	=destination.csv!B1	=SUMIF(\$H\$16:\$H\$141,A5,\$I\$16:\$I\$141)			
6	=destination.csv!B2	=SUMIF(\$H\$16:\$H\$141,A6,\$I\$16:\$I\$141)			
7	=destination.csv!B3	=SUMIF(\$H\$16:\$H\$141,A7,\$I\$16:\$I\$141)			
8	=destination.csv!B4	=SUMIF(\$H\$16:\$H\$141,A8,\$I\$16:\$I\$141)			
9	=destination.csv!B5	=SUMIF(\$H\$16:\$H\$141,A9,\$I\$16:\$I\$141)			
10	=destination.csv!B6	=SUMIF(\$H\$16:\$H\$141,A10,\$I\$16:\$I\$141)			
11	=destination.csv!B7	=SUMIF(\$H\$16:\$H\$141,A11,\$I\$16:\$I\$141)			
12					
13	<b>Total cost of the delays.</b>	<b>=SUM(B5:B11)</b>			
14					
15	<b>Bus Code</b>	<b>Due</b>	<b>Arrived</b>	<b>Late</b>	<b>Minutes</b>
16	2610A1961G	0.491666666666667	0.494444444444444	=IF(B16>C16,0,C16-B16)	=MINUTE(D16)
17	2610A1821G	0.402083333333333	0.404861111111111	=IF(B17>C17,0,C17-B17)	=MINUTE(D17)
18	2610A1251V	0.403472222222222	0.405555555555556	=IF(B18>C18,0,C18-B18)	=MINUTE(D18)
19	2610A1551G	0.503472222222222	0.504861111111111	=IF(B19>C19,0,C19-B19)	=MINUTE(D19)
20	2610A1861V	0.418055555555556	0.419444444444444	=IF(B20>C20,0,C20-B20)	=MINUTE(D20)
21	2610A1021G	0.413888888888889	0.414583333333333	=IF(B21>C21,0,C21-B21)	=MINUTE(D21)
22	2610A1351V	0.477083333333333	0.477083333333333	=IF(B22>C22,0,C22-B22)	=MINUTE(D22)
23	2610A1141V	0.382638888888889	0.382638888888889	=IF(B23>C23,0,C23-B23)	=MINUTE(D23)
24	2610A1641V	0.509722222222222	0.509722222222222	=IF(B24>C24,0,C24-B24)	=MINUTE(D24)
25	2620T1162K	0.460416666666667	0.465277777777778	=IF(B25>C25,0,C25-B25)	=MINUTE(D25)

**Destination**

List of destinations (not routes) visible

1 mark

=SUMIF(...)

1 mark

\$H\$16:\$H\$141

1 mark

,A5

1 mark

,\$I\$16:\$I\$141

1 mark

**Formulae**

Printout fully visible with row and column headings

1 mark

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	F	G
1	<b>Costs incurred from late buses</b>	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15	<b>Bus route</b>	<b>Capacity</b>
16	=MID(A16,9,1)	=VLOOKUP(F16*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
17	=MID(A17,9,1)	=VLOOKUP(F17*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
18	=MID(A18,9,1)	=VLOOKUP(F18*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
19	=MID(A19,9,1)	=VLOOKUP(F19*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
20	=MID(A20,9,1)	=VLOOKUP(F20*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
21	=MID(A21,9,1)	=VLOOKUP(F21*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
22	=MID(A22,9,1)	=VLOOKUP(F22*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
23	=MID(A23,9,1)	=VLOOKUP(F23*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
24	=MID(A24,9,1)	=VLOOKUP(F24*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)
25	=MID(A25,9,1)	=VLOOKUP(F25*1,'D:\CIE\9713\2017\2017_New_June_9713_02\worked\[SEATS.csv]SEATS'!\$A\$2:\$B\$10,2,FALSE)



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	H	I
1		
2		
3		
4	<b>Journey</b>	1 mark
5	New column for cost of delay	1 mark
6	=IF( )	1 mark
7	C16<B16,	1 mark
8	MINUTE(B16-C16)	1 mark
9	, -1*	1 mark
10	MINUTE(C16-B16)	1 mark
11	*G16 reference to Capacity	1 mark
12	*B3 reference to cost per minute per seat	1 mark
13	As an absolute reference	1 mark
14		
15	<b>Destination</b>	<b>Cost of delay</b>
16	=VLOOKUP(MID(A16,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C16<B16,MINUTE(B16-C16),-1*MINUTE(C16-B16))*G16*\$B\$3
17	=VLOOKUP(MID(A17,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C17<B17,MINUTE(B17-C17),-1*MINUTE(C17-B17))*G17*\$B\$3
18	=VLOOKUP(MID(A18,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C18<B18,MINUTE(B18-C18),-1*MINUTE(C18-B18))*G18*\$B\$3
19	=VLOOKUP(MID(A19,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C19<B19,MINUTE(B19-C19),-1*MINUTE(C19-B19))*G19*\$B\$3
20	=VLOOKUP(MID(A20,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C20<B20,MINUTE(B20-C20),-1*MINUTE(C20-B20))*G20*\$B\$3
21	=VLOOKUP(MID(A21,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C21<B21,MINUTE(B21-C21),-1*MINUTE(C21-B21))*G21*\$B\$3
22	=VLOOKUP(MID(A22,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C22<B22,MINUTE(B22-C22),-1*MINUTE(C22-B22))*G22*\$B\$3
23	=VLOOKUP(MID(A23,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C23<B23,MINUTE(B23-C23),-1*MINUTE(C23-B23))*G23*\$B\$3
24	=VLOOKUP(MID(A24,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C24<B24,MINUTE(B24-C24),-1*MINUTE(C24-B24))*G24*\$B\$3
25	=VLOOKUP(MID(A25,5,1),destination.csv!\$A\$1:\$B\$7,2,0)	=IF(C25<B25,MINUTE(B25-C25),-1*MINUTE(C25-B25))*G25*\$B\$3

**Values**

Appropriate title and formatting	1 mark
Place for cost per seat per minute identified	1 mark
Values printout, all data fully visible	1 mark
Single page wide, no row and column headings	1 mark

Costs incurred from late buses								
Cost per minute per seat:	₹ 0.02							
Airport	₹ 14.82							
Chile market	₹ 7.28							
Cansuaim village centre	₹ 26.92							
Shopping mall	₹ 18.85							
Spice farm	₹ 69.99							
Elephant sanctuary	₹ 69.52							
Waterwise - river trip	₹ 33.74							
Total cost of the delays.	₹ 241.14							
Bus Code	Due	Arrived	Late	Minutes	Bus route	Capacity	Destination	Cost of delay
2610A1961G	11:48	11:52	00:04	4	1	15	Airport	₹ 1.28
2610A1821G	09:39	09:43	00:04	4	1	15	Airport	₹ 1.28
2610A1251V	09:41	09:44	00:03	3	1	15	Airport	₹ 0.96
2610A1551G	12:05	12:07	00:02	2	1	15	Airport	₹ 0.64
2610A1861V	10:02	10:04	00:02	2	1	15	Airport	₹ 0.64
2610A1021G	09:56	09:57	00:01	1	1	15	Airport	₹ 0.32
2610A1351V	11:27	11:27	00:00	0	1	15	Airport	₹ 0.00
2610A1141V	09:11	09:11	00:00	0	1	15	Airport	₹ 0.00
2610A1641V	12:14	12:14	00:00	0	1	15	Airport	₹ 0.00
2620T1162K	11:03	11:10	00:07	7	2	16	Elephant sanctuary	₹ 2.39
2620T1912K	11:39	11:46	00:07	7	2	16	Elephant sanctuary	₹ 2.39
2620T1272G	11:31	11:37	00:06	6	2	16	Elephant sanctuary	₹ 2.04
2620T1472V	11:50	11:56	00:06	6	2	16	Elephant sanctuary	₹ 2.04
2620T1342K	11:50	11:55	00:05	5	2	16	Elephant sanctuary	₹ 1.70
2620T1332V	11:11	11:16	00:05	5	2	16	Elephant sanctuary	₹ 1.70
2620T2062K	11:29	11:33	00:04	4	2	16	Elephant sanctuary	₹ 1.36
2620T1802K	11:59	12:03	00:04	4	2	16	Elephant sanctuary	₹ 1.36
2620T1662G	09:29	09:33	00:04	4	2	16	Elephant sanctuary	₹ 1.36
2620T1452V	09:50	09:54	00:04	4	2	16	Elephant sanctuary	₹ 1.36
2620T2002G	11:27	11:30	00:03	3	2	16	Elephant sanctuary	₹ 1.02
2620T1502G	09:31	09:34	00:03	3	2	16	Elephant sanctuary	₹ 1.02
2620T1032K	10:02	10:05	00:03	3	2	16	Elephant sanctuary	₹ 1.02
2620T1092V	10:46	10:48	00:02	2	2	16	Elephant sanctuary	₹ 0.68
2620T2082V	10:23	10:25	00:02	2	2	16	Elephant sanctuary	₹ 0.68
2620T1702V	10:50	10:50	00:00	0	2	16	Elephant sanctuary	₹ 0.00
2620T1612G	10:59	10:59	00:00	0	2	16	Elephant sanctuary	₹ 0.00
2620T1382G	11:00	11:00	00:00	0	2	16	Elephant sanctuary	₹ 0.00
2620T1012G	10:59	10:58	00:00	0	2	16	Elephant sanctuary	₹ 0.34
2630M1313G	11:42	11:49	00:07	7	3	15	Shopping mall	₹ 2.24
2630M2113K	11:34	11:40	00:06	6	3	15	Shopping mall	₹ 1.92
2630M1873G	12:34	12:40	00:06	6	3	15	Shopping mall	₹ 1.92
2630M1573K	11:51	11:56	00:05	5	3	15	Shopping mall	₹ 1.60
2630M2013G	11:32	11:37	00:05	5	3	15	Shopping mall	₹ 1.60
2630M0963G	09:59	10:03	00:04	4	3	15	Shopping mall	₹ 1.28
2630M1083K	09:10	09:14	00:04	4	3	15	Shopping mall	₹ 1.28
2630M1563G	12:52	12:55	00:03	3	3	15	Shopping mall	₹ 0.96
2630M1363V	09:37	09:40	00:03	3	3	15	Shopping mall	₹ 0.96
2630M1793G	11:19	11:22	00:03	3	3	15	Shopping mall	₹ 0.96
2630M1203V	10:45	10:48	00:03	3	3	15	Shopping mall	₹ 0.96
2630M1843K	12:41	12:43	00:02	2	3	15	Shopping mall	₹ 0.64
2630M1543G	10:48	10:50	00:02	2	3	15	Shopping mall	₹ 0.64
2630M1053V	10:43	10:45	00:02	2	3	15	Shopping mall	₹ 0.64
2630M1713K	10:41	10:42	00:01	1	3	15	Shopping mall	₹ 0.32
2630M1723V	12:42	12:43	00:01	1	3	15	Shopping mall	₹ 0.32
2630M0973G	11:23	11:24	00:01	1	3	15	Shopping mall	₹ 0.32
2630M1223V	09:50	09:51	00:01	1	3	15	Shopping mall	₹ 0.32
2630M1513V	10:22	10:23	00:01	1	3	15	Shopping mall	₹ 0.32
2630M1673V	12:58	12:58	00:00	0	3	15	Shopping mall	₹ 0.00
2630M1243G	10:41	10:40	00:00	0	3	15	Shopping mall	₹ 0.32
2630M1953G	12:27	12:27	00:00	0	3	15	Shopping mall	₹ 0.00
2630M1883K	12:41	12:41	00:00	0	3	15	Shopping mall	₹ 0.00
2630M1443V	12:23	12:23	00:00	0	3	15	Shopping mall	₹ 0.00
2640C1114K	10:38	10:45	00:07	7	4	18	Chile market	₹ 2.68
2640C1174K	11:14	11:20	00:06	6	4	18	Chile market	₹ 2.30

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2640C1404G	09:40	09:43	00:03	3 4	18	Chile market	-₹ 1.15
2640C1294V	10:14	10:17	00:03	3 4	18	Chile market	-₹ 1.15
2640C1814V	10:39	10:40	00:01	1 4	18	Chile market	-₹ 0.38
2640C1744G	12:11	12:11	00:00	0 4	18	Chile market	₹ 0.00
2640C2024G	09:35	09:35	00:00	0 4	18	Chile market	₹ 0.00
2640C1924K	09:46	09:45	00:00	0 4	18	Chile market	₹ 0.38
2640C1484V	10:14	10:14	00:00	0 4	18	Chile market	₹ 0.00
2640C1624K	09:00	09:00	00:00	0 4	18	Chile market	₹ 0.00
2650T1325G	12:50	13:15	00:25	25 5	32	Elephant sanctuary	-₹ 17.04
2650T1045V	11:37	11:48	00:11	11 5	32	Elephant sanctuary	-₹ 7.50
2650T1435K	11:05	11:15	00:10	10 5	32	Elephant sanctuary	-₹ 6.82
2650T1695G	12:32	12:38	00:06	6 5	32	Elephant sanctuary	-₹ 4.09
2650T1655K	12:01	12:05	00:04	4 5	32	Elephant sanctuary	-₹ 2.73
2650T1975K	10:32	10:36	00:04	4 5	32	Elephant sanctuary	-₹ 2.73
2650T1785V	10:24	10:27	00:03	3 5	32	Elephant sanctuary	-₹ 2.04
2650T2055V	12:39	12:41	00:02	2 5	32	Elephant sanctuary	-₹ 1.36
2650T1155K	12:04	12:06	00:02	2 5	32	Elephant sanctuary	-₹ 1.36
2650T2105G	10:01	10:02	00:01	1 5	32	Elephant sanctuary	-₹ 0.68
2650T1945V	10:32	10:33	00:01	1 5	32	Elephant sanctuary	-₹ 0.68
2650T1235K	09:14	09:15	00:01	1 5	32	Elephant sanctuary	-₹ 0.68
2650T1535V	09:28	09:28	00:00	0 5	32	Elephant sanctuary	₹ 0.00
2660D0956K	12:33	12:52	00:19	19 6	16	Cansuallim village centre	-₹ 6.48
2660D1586G	11:04	11:13	00:09	9 6	16	Cansuallim village centre	-₹ 3.07
2660D1216G	11:11	11:19	00:08	8 6	16	Cansuallim village centre	-₹ 2.73
2660D1686V	11:01	11:08	00:07	7 6	16	Cansuallim village centre	-₹ 2.39
2660D1066V	12:34	12:40	00:06	6 6	16	Cansuallim village centre	-₹ 2.04
2660D1136K	11:41	11:46	00:05	5 6	16	Cansuallim village centre	-₹ 1.70
2660D1856G	12:31	12:36	00:05	5 6	16	Cansuallim village centre	-₹ 1.70
2660D1376K	11:30	11:35	00:05	5 6	16	Cansuallim village centre	-₹ 1.70
2660D1526K	10:32	10:35	00:03	3 6	16	Cansuallim village centre	-₹ 1.02
2660D1986G	09:54	09:57	00:03	3 6	16	Cansuallim village centre	-₹ 1.02
2660D1896G	12:29	12:32	00:03	3 6	16	Cansuallim village centre	-₹ 1.02
2660D0996V	10:50	10:52	00:02	2 6	16	Cansuallim village centre	-₹ 0.68
2660D2036V	10:35	10:37	00:02	2 6	16	Cansuallim village centre	-₹ 0.68
2660D1266G	12:59	13:00	00:01	1 6	16	Cansuallim village centre	-₹ 0.34
2660D1766K	10:53	10:54	00:01	1 6	16	Cansuallim village centre	-₹ 0.34
2660D1416G	10:29	10:29	00:00	0 6	16	Cansuallim village centre	₹ 0.00
2670S1777K	09:33	09:52	00:19	19 7	53	Spice farm	-₹ 21.45
2670S1127G	09:21	09:30	00:09	9 7	53	Spice farm	-₹ 10.16
2670S1937K	11:32	11:40	00:08	8 7	53	Spice farm	-₹ 9.03
2670S1497G	12:30	12:36	00:06	6 7	53	Spice farm	-₹ 6.77
2670S2047V	11:11	11:17	00:06	6 7	53	Spice farm	-₹ 6.77
2670S1637G	12:00	12:05	00:05	5 7	53	Spice farm	-₹ 5.64
2670S1287V	11:41	11:45	00:04	4 7	53	Spice farm	-₹ 4.52
2670S1197V	12:53	12:55	00:02	2 7	53	Spice farm	-₹ 2.26
2670S1597K	10:04	10:06	00:02	2 7	53	Spice farm	-₹ 2.26
2670S1007K	12:11	12:12	00:01	1 7	53	Spice farm	-₹ 1.13
2670S1307K	10:27	10:28	00:01	1 7	53	Spice farm	-₹ 1.13
2670S1837G	09:34	09:34	00:00	0 7	53	Spice farm	₹ 0.00
2670S2097K	12:19	12:19	00:00	0 7	53	Spice farm	₹ 0.00
2670S1907V	09:15	09:15	00:00	0 7	53	Spice farm	₹ 0.00
2670S0987V	09:05	09:05	00:00	0 7	53	Spice farm	₹ 0.00
2670S1427G	10:11	10:10	00:00	0 7	53	Spice farm	₹ 1.13
2680A8798G	12:39	12:48	00:09	9 8	12	Airport	-₹ 2.30
2680A8148G	10:06	10:14	00:08	8 8	12	Airport	-₹ 2.04
2680A9058V	11:41	11:48	00:07	7 8	12	Airport	-₹ 1.79
2680A7338K	12:33	12:39	00:06	6 8	12	Airport	-₹ 1.53
2680A7168K	12:03	12:09	00:06	6 8	12	Airport	-₹ 1.53
2680A3938K	10:50	10:53	00:03	3 8	12	Airport	-₹ 0.77
2680A1038K	10:32	10:33	00:01	1 8	12	Airport	-₹ 0.26
2680A7568V	12:42	12:40	00:00	0 8	12	Airport	₹ 0.51
2680A8788G	11:11	11:11	00:00	0 8	12	Airport	₹ 0.00
2690W2079G	11:40	11:58	00:18	18 9	48	Waterwise - river trip	-₹ 18.40
2690W1609G	11:04	11:12	00:08	8 9	48	Waterwise - river trip	-₹ 8.18
2690W1109V	11:53	11:57	00:04	4 9	48	Waterwise - river trip	-₹ 4.09
2690W1079K	09:02	09:05	00:03	3 9	48	Waterwise - river trip	-₹ 3.07
2690W1759V	11:29	11:30	00:01	1 9	48	Waterwise - river trip	-₹ 1.02
2690W1469K	09:47	09:47	00:00	0 9	48	Waterwise - river trip	₹ 0.00
2690W1739V	10:11	10:11	00:00	0 9	48	Waterwise - river trip	₹ 0.00
2690W1189V	10:31	10:31	00:00	0 9	48	Waterwise - river trip	₹ 0.00

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2690W1399G	12:49	12:49	00:00	0 9	48	Waterwise - river trip	₹ 0.00
2690W1999K	09:07	09:06	00:00	0 9	48	Waterwise - river trip	₹ 1.02

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**APPLIED INFORMATION & COMMUNICATION TECHNOLOGY**

**9713/04**

Paper 4 Practical Test B

**May/June 2017**

MARK SCHEME

Maximum Mark: 90

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**Published**

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.

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This document consists of **7** printed pages.

			Mark
Task 1	Player ID	Substring function for Forname components e.g. <i>LEFT(C2,2)</i> or <i>MID(C2,1,2)</i>	1
		Substring function for Surname components e.g. <i>LEFT(D2,2)</i> or <i>MID(D2,1,2)</i>	1
		Valid Concatenation	1
	Player Age	Efficient interval calculation method ( <i>Use of DateDiff</i> )	1
		Reference to player date of birth	1
		Function to return current date e.g. <i>NOW()</i> or <i>TODAY()</i>	1
		Parameter to extract years from interval function	1
	Player status	Nested IF function used ( <i>2 levels only</i> )	1
		Junior results <18	1
		Adult results 18-54	1
		Senior results >54	1
	Player Fee	Efficient LOOKUP function used - <i>without transposition of data</i>	1
		Lookup_value set on Status	1
		Correct table_array references	1
		Correct column_index reference	1
Correct parameter for an exact match		1	
Printout	Sheet printed with correct values	1	
	Data and labels all visible and Player_fee set to € 0 d.p	1	
Total Task 1			18

			Mark
Task 2	Database Evidence of...	PlayerStatusAndFees file imported ( <i>all/only required fields shown</i> )	1
		Player_ID set as primary key	1
		Player_fee set to currency, ( <i>+evidence of set to € 0 dp in structure</i> )	1
		Fee_due set to yes/no (Boolean)	1
	Player status report	Correct title + logo	1
		Correct fields shown ( <i>only</i> )	1
		Data grouped by Player_status	1
		Single report – ( <i>each group on separate page</i> )	1
		Correct players shown in each group	1
		A total of players shown for each group	1
		Suitable label for each for total	1
		Correct total of adult players ( <i>31</i> )	1
		Correct total of junior players ( <i>6</i> )	1
		Correct total of senior players ( <i>3</i> )	1
Total Task 2			14

			Mark
Task 3a	Mailmerge query evidence	Evidence of the database used for the selection of recipients	1
		Valid selection method ( <i>query or SKIPIF</i> ) for players with Fee_due = TRUE	1
		Evidence of valid exclusion method for Gurdeep Dasgupta	1
	insertion prompts must be replaced for the mark  Merge document  insertion prompts must be replaced for the 'correct text' mark	Logo inserted and fully visible	1
		Date inserted and shown as a field	1
		Player:_ title, _forename and _surname mergefields inserted	1
		Correct spacing in single line of name fields	1
		All Address mergfields inserted in correct place – ( <i>1 per line</i> )	1
		Salutation Player_forename mergefield inserted ( <i>with correct spacing and comma</i> )	1
		Player_status mergefield inserted ( <i>with correct spacing and comma</i> )	1
		Player_fee mergefield ( <i>with correct spacing and full stop</i> )	1
		Single valid conditional mergefield for Junior players ...	1
		Correct conditional text for Junior players	1
		Single valid conditional mergefield for Adult players ...	1
		Correct conditional text for Adult players	1
		Correct Default conditions + Single mergefield for Senior players ...	1
Correct conditional text for Senior players	1		
Total Task 3a			17



			Mark
Task 3b	Printed Letters	Date shown in correct format e.g. 29/03/2017 (not as field)	1
		Only correct 3 letters present	1
		Fatima Hedge shown as an Adult	1
		€25 Fee due shown	1
		Correct text shown (Our annual dinner dance will be held in August.)	1
		Hans Schumacher shown as Senior	1
		€15 Fee due shown	1
		Correct text shown (Our senior skills club will begin again in September.)	1
		Johann Schmidt shown as Adult	1
		€25 Fee due shown	1
		Correct text shown (Our annual dinner dance will be held in August.)	1
		Letters proofed and fit for purpose (including € sign, spacing and punctuation)	1
Total Task 3b			12

			Mark
Task 4	League Table	Single formula for points $(C2*3)+D2$ or valid equivalent	1
		Correct data for all teams before additions (1.Jolly H.=46, 2.James Town=45, 3.The Scarlets=44, 4.Putt Rovers=44...7.The Red Tigers=36, 8.Putt United=36)	1
		Correct data for all teams after additions (1.Putt Rovers=47, 2.James Town=46, 3.Jolly.H=46,...7.The Red Tigers=36, 8.Putt United=36)	1
	Macro	Single macro - Correct range selected (e.g. B2:F21 or B1:F21 with .header=x/Yes)	1
		Primary sort on Points (e.g. range F2:F21 or F1:F21 with .header=x/Yes)	1
		Sort descending instruction shown	1
		Secondary sort on Games won (e.g. range C2:C21)	1
		Sort descending instruction shown	1
		Programmer annotations for selecting range area(s) inserted	1
		Programmer annotations for sorting inserted	1
		Button/ shape/toolbar icon shown	1
		Button named 'Update League Table' (or tooltip) shown	1
		Evidence that the Macro has been assigned to button	1
Total Task 4			13

			Mark
Task 5	Merge labels evidence insertion prompts must be replaced for the mark	Team name mergefield inserted	1
		Position mergefield inserted	1
		Points mergefield inserted ( <i>Team points label shown</i> )	1
		Conditional field for position 1 inserted	1
		Position 1 to display correct text ( <i>WINNERS</i> )	1
		Conditional field for position 2 inserted	1
		Position 2 to display correct text ( <i>RUNNERS UP</i> )	1
		Evidence of valid non-manual selection method for points >40	1
	Labels printed	Team name and Position formatted to 26pt	1
		Team name and Positon in correct order ( <i>on same line with space</i> )	1
		Team Points label shown and Points formatted to 16pt	1
		Correct 5 labels <i>only</i> printed	1
		Correct 4 labels in correct order on first page	1
		Logo present on each label	1
		‘Putt Rovers 1’ shown as 'WINNERS'	1
		‘James Town Rovers 2’ as <i>only</i> 'RUNNERS UP'	1
Total Task 5			16
Total Paper			90

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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/11**

Paper 1 Written A

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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.

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Question	Answer	Marks
1	Customers have to have a computer and be connected to the Internet to view posters on billboards.	
	A website can be expensive to maintain compared to other methods.	✓
	Posters/presentations can only be seen in a limited number of places.	✓
	Posters cannot be defaced as easily as presentations in shopping malls.	
	Hard copy flyers are interactive.	
	Printed posters have multimedia features.	
	Websites and presentations are easier to update as you do not have to reprint many copies.	✓
	A much wider area/potential customer base is covered cheaply by using flyers.	
	Emailed advertisements may be mistaken for spam.	✓
	It is difficult to send the same message to many people at the same time if using email.	
		4

Question	Answer		Marks
2	It is cheaper than employing a programmer to create and maintain it.	✓	4
	Pop-ups may create unhappy customers who may avoid that company in future.	✓	
	Customers will use pop-up blocking software which does not allow pop-unders to appear.		
	A pop-up does not appear to users until they close the page they are working on.		
	The company's own website has a longer delay in updating or improving the advertising material.		
	The customer regards pop-unders as less of an inconvenience than pop-ups.	✓	
	There is no way of linking pop-ups and pop-unders to the company's own website.		
	The company has more control over the host's website than it would over its own.		
	There may be so many other companies advertising on the host's website that the company's advertising has less space available.	✓	
	Fewer people may see it if it is on someone else's website.		

Question	Answer	Marks
3(a)	<p><b>Two from:</b></p> <p>Involves working the same number of hours as normal/in a week  Work more hours per day...  ...over a shorter number of days  Usually involves working 4½ days in a week/9 days out of 10 in a period of two weeks.</p>	<b>2</b>
3(b)	<p><b>Eight from:</b></p> <p><i>Employees</i>  Earn the same amount of money but work fewer days  They can have long weekends (by finishing early on Fridays or not working Fridays)  Travel to work fewer days so less time spent travelling  Travel to work fewer days so less money spent travelling  By working longer days they can get very tired and not be able to enjoy their extra days off  It can put extra pressure on some workers if they are required to work when other workers are not prepared to work  Allows workers to organise their working lives to suit their personal needs</p> <p><i>Company</i>  Allowing for programmers' individual needs leads to lower absenteeism/better punctuality among programmers  Programmers prefer flexibility so are more productive/more motivated  It may take managers longer to organise the system  It may not be possible with some areas of work  There is a danger of lower productivity, as some workers may work unsupervised during early or late times, and when left alone they might not work as hard.</p> <p>One mark is available for a reasoned conclusion.</p>	<b>8</b>

Question	Answer	Marks
4(a)	<p><b>Six from:</b></p> <p>Can compare products and prices at their leisure  Can shop at a convenient time for them/24/7  Customers can shop at their favourite store even when they live far away  Customers do not have to spend time travelling to shop  Customers do not have to spend money travelling to shop  Disabled customers will find it easier than travelling to shop  There will be a greater choice of goods  Do not have to spend time queuing</p> <p>Disabled people may have problems navigating through screens  Customers who do not have a credit/debit card will not be able to use online shopping  Can order goods and they do not get delivered  Goods are not to the same standard as those ordered/wrong goods delivered/substitute goods delivered  Cannot check the standard of goods before buying/cannot be sure the goods are in stock  May be hidden costs such as delivery charges  Expense of buying a computer with a broadband internet connection/must have a reliable electricity supply/basic computer skills.</p> <p>One mark is available for a reasoned conclusion.  Must have at least one advantage and disadvantage to gain full marks.</p>	<b>6</b>
4(b)	<p><b>Six from:</b></p> <p>They can employ fewer staff and pay less in staff wages  Because of their lower costs, they can offer cheaper goods thus attracting more customers  Shoppers can shop 24/7 so company could gain increased profits  Internet more likely to attract customers worldwide, increasing profits</p> <p>Less personal touch so it is harder to sell other products  Initial/running costs such as having to pay website developers  Initial costs such as buying the hardware when starting up  Will have had to retrain staff which is costly.</p> <p>One mark is available for a reasoned conclusion.  Must have at least one advantage and disadvantage to gain full marks.</p>	<b>6</b>



Question	Answer	Marks
5(a)	<p><b>Three from:</b></p> <p>Database of customers' information/previous orders for operator to search caller's details</p> <p>Word processor to type up data about the call</p> <p>Email software to send to customer confirmation of call and action taken</p> <p>Web browser to search intranet/internet for extra help</p> <p>Allow answers relating to customer service.</p>	3
5(b)	<p><b>Six from:</b></p> <p><i>First-party call control</i></p> <p>Allows operator to have a direct connection between their computer and the phone set</p> <p>Allows the operator's computer to control the functions of the operator's phone</p> <p>Suitable only for the smallest of call centres</p> <p><i>Third-party call control</i></p> <p>Requires a dedicated telephony server to connect the telephone network and the computer network</p> <p>Operator's phone communicates directly with the server</p> <p>Operator's phone is not directly connected to their computer</p> <p>The server controls all the phones</p> <p>The server can direct a call to the appropriate operator</p> <p>Any computer in the system can control any phone</p> <p>Suitable for large call centres.</p>	6

Question	Answer	Marks
6(a)	<p>= IF(B6 &lt; 75,"Small",IF(B6 &lt; = 95,"Medium","Large"))</p> <p>Nested IF (2 tiers with correct number of closing brackets) – 1 mark</p> <p>IF B6 &lt; 75</p> <p>Returns Small – 1 mark</p> <p>IF B6 &lt; = 95 – 1 mark</p> <p>Returns Medium – 1 mark</p> <p>IF B6 &gt; 95 returns Large – 1 mark</p> <p>No absolute cell referencing – 1 mark</p>	6
6(b)	<p><b>Four from:</b></p> <p>Waist sizes would be typed into column B</p> <p>These would then be rounded in column C...</p> <p>...using a formula in C6...</p> <p>...such as ROUND(B6, 0) <b>or</b> INT(B6)</p> <p>B6 in the formula would need to be changed to C6</p> <p>to give = IF(C6 &lt; 75,"Small",IF(C6 &lt; = 95,"Medium","Large")) – 2 marks for fully correct formula.</p>	4

Question	Answer	Marks
7	<b>Three matched pairs:</b>	
	Examining documents <u>used in the system</u>	<b>1</b>
	Benefit – Helps to identify the inputs and outputs of the system/volume of data can be determined/processing can be deduced	<b>1</b>
	Interview <u>system users</u>	<b>1</b>
	Benefit – Interviewer can move away from their 'script' and ask a more in-depth question if a particular response is given/can interpret body language	<b>1</b>
	Can distribute questionnaires to <u>system users</u>	<b>1</b>
	Benefit – Answers tend to be, on the whole, more accurate/everyone can complete the questionnaire at the same time instead of one after the other (as with interviews)/can complete it at their leisure	<b>1</b>

Question	Answer	Marks
8	<p><b>Six from:</b></p> <p>When data flows from or to somebody or somewhere outside the system, that somebody or somewhere is called a terminator/external entity  Here the terminator/external entity could be the GP/family doctor  The processing of patient data is put in a process box  The actual data output from the system, is recorded for future use  Such data is therefore called a store...  ...such as the treatment received by a patient  Each flow arrow is labelled to show what data is flowing at that point in the diagram  The label might be the patient's treatment.</p>	<b>6</b>

Question	Answer	Marks
9	<p><b>Six from:</b></p> <p>Hospital workers have a personal duty of confidence to individuals whose data is stored</p> <p>Hospital workers should have a personal duty of confidence to their employer</p> <p>Workers must not tell any unauthorised person about personal data which is held</p> <p>Hospital must not use information for any reason except with the permission of the individual</p> <p>Workers must be asked to treat the information as confidential/it must be obvious to them that the information is given in confidence</p> <p>Hospital should ask employee to sign a confidentiality agreement</p> <p>Hospital should take responsibility for any information which is passed on</p> <p>Only the least amount of information that could identify the individual should be used</p> <p>Information should not be passed on from organisation to organisation without authorisation from the individual</p> <p>Anonymised information should always omit personal details wherever possible</p> <p>Aggregated information should never identify individuals</p> <p>Hospital/workers must ensure the security of customer data</p> <p>Workers must ensure only relevant data is used</p> <p>Workers should ensure they only use up to date/accurate information.</p>	6

Question	Answer	Marks
10	<p><b>Five from:</b></p> <p>Select suitable data</p> <p>...including normal, abnormal and extreme data</p> <p>Expected results and actual results are recorded</p> <p>Actual and expected results are compared</p> <p>Comments on comparison are recorded/comments are made as to whether system needs to be changed or otherwise</p> <p>Live data could be used</p> <p>Comparison between actual results and previous system results.</p>	5

Question	Answer	Marks
11(a)	<p><b>Three from:</b></p> <p>There are personal/private (users' own) calendars and public calendars  Open her private calendar to see when he is free  Open the public calendar showing when other workers are free  Identify a suitable time when he is free and when others are free/where there are no clashes  Notify the programmers of the time and date of the meeting  Calendar software would advise him of any clashes  Pietr would type in the details of the meeting  Pietr sets an alarm to alert him when the meeting starts  Calendar function keeps a record of appointments and meeting times.</p>	<b>3</b>
11(b)	<p><b>Five from:</b></p> <p>Identifying short- and long-term targets  Set deadlines for the completion of each task  Can set the relative importance of each target  Helps to devote appropriate resources/workers (to achieving that target)  Helps in planning the steps needed to produce a solution  Using Gantt charts...  ...to represent parallel and sequential tasks...  ...to help ensure sequential tasks are completed in time for the next one  ...to help ensure parallel tasks finish at the same time  Helps in making correct decisions which will affect the time taken at each stage  Helps to arrange workload  Can monitor progress by seeing how long a task has taken so far/see how long tasks should take.</p>	<b>5</b>

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**APPLIED INFORMATION & COMMUNICATION TECHNOLOGY**

**9713/12**

Paper 1 Written A

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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This document consists of **7** printed pages.

Question	Answer	Marks																				
1	<table><tr><td>A hard disk provides direct access.</td><td>✓</td></tr><tr><td>A CD ROM stores several Gigabytes of data.</td><td></td></tr><tr><td>A Blu-ray disk stores less data than a DVD.</td><td></td></tr><tr><td>A magnetic tape has quicker data access than a hard disk.</td><td></td></tr><tr><td>A magnetic tape is a suitable medium for storing backups of server data.</td><td>✓</td></tr><tr><td>A CD R/W cannot be overwritten.</td><td></td></tr><tr><td>Blu-ray disks are not used to store data.</td><td></td></tr><tr><td>A pen drive can store more data than a CD.</td><td>✓</td></tr><tr><td>Flash memory cards are used in mobile (cell) phones.</td><td>✓</td></tr><tr><td>Solid state drives are more prone to failure than magnetic media.</td><td></td></tr></table>	A hard disk provides direct access.	✓	A CD ROM stores several Gigabytes of data.		A Blu-ray disk stores less data than a DVD.		A magnetic tape has quicker data access than a hard disk.		A magnetic tape is a suitable medium for storing backups of server data.	✓	A CD R/W cannot be overwritten.		Blu-ray disks are not used to store data.		A pen drive can store more data than a CD.	✓	Flash memory cards are used in mobile (cell) phones.	✓	Solid state drives are more prone to failure than magnetic media.		4
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Question	Answer	Marks																				
2	<table><tr><td>Data files are often converted to a common text format in order that they can be exported to another software package.</td><td>✓</td></tr><tr><td>Validation is to check that data is reasonable.</td><td>✓</td></tr><tr><td>Verification is to check that data is correct.</td><td></td></tr><tr><td>A range check is a verification check.</td><td></td></tr><tr><td>Comparing two versions of the same input data is a type of verification.</td><td>✓</td></tr><tr><td>Charts are never exported from a database into another software package.</td><td></td></tr><tr><td>OR and NOT are mathematical operators.</td><td></td></tr><tr><td>It is only possible to sort data on one criterion.</td><td></td></tr><tr><td>“Several to several” is a type of relationship.</td><td></td></tr><tr><td>In order to create a relational database you have to identify a key field.</td><td>✓</td></tr></table>	Data files are often converted to a common text format in order that they can be exported to another software package.	✓	Validation is to check that data is reasonable.	✓	Verification is to check that data is correct.		A range check is a verification check.		Comparing two versions of the same input data is a type of verification.	✓	Charts are never exported from a database into another software package.		OR and NOT are mathematical operators.		It is only possible to sort data on one criterion.		“Several to several” is a type of relationship.		In order to create a relational database you have to identify a key field.	✓	4
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In order to create a relational database you have to identify a key field.	✓																					

Question	Answer	Marks
3	<p><b>Four from:</b></p> <p>Spreadsheet/graphing software to store data to plot student progress charts</p> <p>Spreadsheet to store data and use conditional formatting to show student progress/targets</p> <p>Web browser to check the reports have loaded satisfactorily</p> <p>Word processing software to type up reports</p> <p>Email software to inform the Principal that the reports have been uploaded</p> <p>IM software to inform the Principal that the reports have been uploaded.</p>	4

Question	Answer	Marks
4	<p><b>Six from:</b></p> <p>Student answers are neater (using computers) so <u>easier for teacher to read</u> and mark</p> <p>Will take longer to carry out the test as students cannot type as fast as they can write</p> <p>Can include videos and sound to illustrate questions which will make the test more interesting for the students</p> <p>If the network crashes there will be a delay in the testing</p> <p>Students will find the test more interesting so less likely to skip school</p> <p>No need to worry about students forgetting writing equipment.</p> <p>1 mark available for a reasoned conclusion.</p>	6

Question	Answer	Marks
5(a)	<p>LEFT(E2,1)</p> <p>LEFT() E2,1</p> <p>1 mark 1 mark</p>	2
5(b)	<p>MID(E2,2,1)</p> <p>MID() E2,2 ,1</p> <p>1 mark 1 mark 1 mark</p>	3
5(c)	<p>RIGHT(E2,1)</p> <p>RIGHT() E2,1</p> <p>1 mark 1 mark</p>	2
5(d)	<p>CONCATENATE (I2, H2, G2)</p> <p>CONCATENATE() I2, H2 ,G2</p> <p>1 mark 1 mark 1 mark</p>	3

Question	Answer	Marks
6	<p><b>Five from:</b></p> <p>A right to object to processing that is likely to cause or is causing damage or distress</p> <p>A right to prevent processing for direct marketing</p> <p>A right to object to decisions being taken by automated means</p> <p>A right in certain circumstances to have inaccurate personal data rectified, blocked, erased or destroyed</p> <p>A right to claim compensation for damages caused by a breach of the legislation</p> <p>A right of access to a copy of the information comprised in their personal data</p> <p><i>An individual is entitled to be informed about –</i></p> <p>Whether a company is processing data about the individual</p> <p>The personal data which a company holds about them</p> <p>The purposes for which the data are being or are to be processed</p> <p>The companies/recipients or classes of companies/recipients to whom they are or may be disclosed</p> <p><i>To have communicated to them in an intelligible form –</i></p> <p>The personal data being held about the individual</p> <p>The source of the data</p> <p>If it is being used to evaluate matters relating to them such as, for example, performance at work, creditworthiness, reliability or conduct.</p>	5

Question	Answer	Marks
7(a)	<p><b>A</b>      Evaporating unit      1 mark</p> <p><b>B</b>      Compressor      1 mark</p> <p><b>C</b>      Condensing unit      1 mark</p>	3
7(b)	<p><b>Three from:</b></p> <p>If pressure of refrigerant is above preset value Microprocessor opens valve wider...</p> <p>...to increase the flow of refrigerant</p> <p>If pressure of refrigerant is below preset value Microprocessor makes valve opening narrower...</p> <p>...to reduce the flow of refrigerant.</p>	3



Question	Answer	Marks
8(a)	<p><b>Six from:</b></p> <p>Journalist types up/edits their story using word-processing software/DTP            Journalist types up/edits their story using laptop/tablet computer            Takes photographs using a digital camera/phone/tablet computer            Import images from digital camera/phone            Edit images using image editing software            Connect laptop/tablet computer to internet using mobile phone/WIFI hotspot/dongle            Email story to editor's office            Email photos separately using phone/laptop/tablet computer.</p>	6
8(b)	<p><b>Six from:</b></p> <p>Edit/format the journalist's story to remove mistakes            Crop the images to remove unwanted material            Resize the image to fill the layout            Choose margin sizes            Produce the layout/template of the magazine page            Kerning – the process of adjusting the space between individual letters in words            Adjusting the leading – the space between lines on a page            Adjust the size/type of font in the bodytext            Adjust the size/type of font in the headings/headlines            Change the font type so it is easy to read            Adjust the font size so it is small enough for stories to fit on a page            Adjust the font size so it is large enough to read.</p>	6

Question	Answer	Marks
9	<p><b>Four from:</b></p> <p>Have less contact with colleagues            More difficult to discuss ideas with colleagues            Cannot see the editor daily...            ...so have less chance to impress editor to improve job prospects            More difficult to attend meetings to keep up to speed with newspaper developments.</p>	4

Question	Answer	Marks
10	<p><b>Two from:</b></p> <p>Ultraviolet light is allowed to pass through the film negatives...            ...to expose the printing plate            When the plates are exposed to light, a chemical reaction occurs            This allows the light-sensitive coating on the aluminium to develop the image.</p>	2

Question	Answer	Marks
11	<p><b><i>Eight from:</i></b></p> <p><i>He would need exception reports to:</i>            Make sure that somebody was not being paid too much            Tell him if the system was working properly or not            Let him know if the system was accepting duplicate data</p> <p><i>He would need to have financial reports so that:</i>            He could see trends in pay across the company            He could compare pay across departments in the company            He could see the pay structure within departments            He could see how much the company was spending on paying the workers/tax authorities</p> <p><i>Examples</i>  <i>Exception reports</i>            An employee earning an unusually large amount of money            An employee who has been on an emergency tax code for a long period of time            Two employees having the same national insurance number</p> <p><i>Financial reports</i>            Information about all employees of the company            Information about employees in a given department            Information about the salaries of all employees            Total salaries of all employees            National insurance contributions for all employees            The total amount of national insurance contributions paid to the tax authorities            The income tax that each employee has paid            The total amount of income tax paid to the tax authorities            The amount of money paid to each bank that employees have an account with            All the earnings and deductions of employees            The earnings and deductions of each employee by department            A summary of all the totals of the earnings/deductions of each department.</p> <p>Must have reasons to gain more than 6 marks.</p>	8

Question	Answer	Marks
12(a)	<p><b><i>Two from:</i></b></p> <p>Could observe <u>users performing set tasks</u>...            ...and record their progress using video recording            Get a user to perform a task and measure the time it takes them to carry out the task.</p>	2

Question	Answer	Marks
12(b)	<p><b>Five from:</b></p> <p>Observation gives you an overall view of the whole system  Observer can see how separate tasks overlap  Can see how workers interact  Can see if the methods being used are efficient  Does not give you an opportunity to find out what users think of the new system  Some people who know they are being observed change the way they work</p> <p>1 mark is available for a reasoned conclusion.</p>	<b>5</b>

Question	Answer	Marks
13	<p><b>Eight from:</b></p> <p>You would have a time axis horizontally  A list of stages of the project/systems life cycle vertically  Some activities would be in sequence horizontally  Some activities would be in parallel vertically  Examples of sequential activities would be Analysis, followed by Design followed by Development, Testing, Implementation then Evaluation  One mark for any two individual examples of parallel activities within different stages of the systems life cycle (one from each of Analysis, Design, Development, Testing, Implementation, Evaluation e.g. Analysis –interviews, questionnaires, examining documents, observation).</p> <p>One mark for any two individual examples of sequential activities from different stages of the systems life cycle (e.g. Designing the required data structures and creating the data structures).</p>	<b>8</b>

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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/13**

Paper 1 Written A

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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This document consists of **9** printed pages.

Question	Answer	Marks
1	Customers have to have a computer and be connected to the Internet to view posters on billboards.	
	A website can be expensive to maintain compared to other methods.	✓
	Posters/presentations can only be seen in a limited number of places.	✓
	Posters cannot be defaced as easily as presentations in shopping malls.	
	Hard copy flyers are interactive.	
	Printed posters have multimedia features.	
	Websites and presentations are easier to update as you do not have to reprint many copies.	✓
	A much wider area/potential customer base is covered cheaply by using flyers.	
	Emailed advertisements may be mistaken for spam.	✓
	It is difficult to send the same message to many people at the same time if using email.	
		4

Question	Answer		Marks
2	It is cheaper than employing a programmer to create and maintain it.	✓	4
	Pop-ups may create unhappy customers who may avoid that company in future.	✓	
	Customers will use pop-up blocking software which does not allow pop-unders to appear.		
	A pop-up does not appear to users until they close the page they are working on.		
	The company's own website has a longer delay in updating or improving the advertising material.		
	The customer regards pop-unders as less of an inconvenience than pop-ups.	✓	
	There is no way of linking pop-ups and pop-unders to the company's own website.		
	The company has more control over the host's website than it would over its own.		
	There may be so many other companies advertising on the host's website that the company's advertising has less space available.	✓	
	Fewer people may see it if it is on someone else's website.		

Question	Answer	Marks
3(a)	<p><b>Two from:</b></p> <p>Involves working the same number of hours as normal/in a week            Work more hours per day...            ...over a shorter number of days            Usually involves working 4½ days in a week/9 days out of 10 in a period of two weeks.</p>	<b>2</b>
3(b)	<p><b>Eight from:</b></p> <p><i>Employees</i>            Earn the same amount of money but work fewer days            They can have long weekends (by finishing early on Fridays or not working Fridays)            Travel to work fewer days so less time spent travelling            Travel to work fewer days so less money spent travelling            By working longer days they can get very tired and not be able to enjoy their extra days off            It can put extra pressure on some workers if they are required to work when other workers are not prepared to work            Allows workers to organise their working lives to suit their personal needs</p> <p><i>Company</i>            Allowing for programmers' individual needs leads to lower absenteeism/better punctuality among programmers            Programmers prefer flexibility so are more productive/more motivated            It may take managers longer to organise the system            It may not be possible with some areas of work            There is a danger of lower productivity, as some workers may work unsupervised during early or late times, and when left alone they might not work as hard.</p> <p>One mark is available for a reasoned conclusion.</p>	<b>8</b>

Question	Answer	Marks
4(a)	<p><b>Six from:</b></p> <p>Can compare products and prices at their leisure  Can shop at a convenient time for them/24/7  Customers can shop at their favourite store even when they live far away  Customers do not have to spend time travelling to shop  Customers do not have to spend money travelling to shop  Disabled customers will find it easier than travelling to shop  There will be a greater choice of goods  Do not have to spend time queuing</p> <p>Disabled people may have problems navigating through screens  Customers who do not have a credit/debit card will not be able to use online shopping  Can order goods and they do not get delivered  Goods are not to the same standard as those ordered/wrong goods delivered/substitute goods delivered  Cannot check the standard of goods before buying/cannot be sure the goods are in stock  May be hidden costs such as delivery charges  Expense of buying a computer with a broadband internet connection/must have a reliable electricity supply/basic computer skills.</p> <p>One mark is available for a reasoned conclusion.  Must have at least one advantage and disadvantage to gain full marks.</p>	<b>6</b>
4(b)	<p><b>Six from:</b></p> <p>They can employ fewer staff and pay less in staff wages  Because of their lower costs, they can offer cheaper goods thus attracting more customers  Shoppers can shop 24/7 so company could gain increased profits  Internet more likely to attract customers worldwide, increasing profits</p> <p>Less personal touch so it is harder to sell other products  Initial/running costs such as having to pay website developers  Initial costs such as buying the hardware when starting up  Will have had to retrain staff which is costly.</p> <p>One mark is available for a reasoned conclusion.  Must have at least one advantage and disadvantage to gain full marks.</p>	<b>6</b>



Question	Answer	Marks
5(a)	<p><b>Three from:</b></p> <p>Database of customers' information/previous orders for operator to search caller's details</p> <p>Word processor to type up data about the call</p> <p>Email software to send to customer confirmation of call and action taken</p> <p>Web browser to search intranet/internet for extra help</p> <p>Allow answers relating to customer service.</p>	3
5(b)	<p><b>Six from:</b></p> <p><i>First-party call control</i></p> <p>Allows operator to have a direct connection between their computer and the phone set</p> <p>Allows the operator's computer to control the functions of the operator's phone</p> <p>Suitable only for the smallest of call centres</p> <p><i>Third-party call control</i></p> <p>Requires a dedicated telephony server to connect the telephone network and the computer network</p> <p>Operator's phone communicates directly with the server</p> <p>Operator's phone is not directly connected to their computer</p> <p>The server controls all the phones</p> <p>The server can direct a call to the appropriate operator</p> <p>Any computer in the system can control any phone</p> <p>Suitable for large call centres.</p>	6

Question	Answer	Marks
6(a)	<p>= IF(B6 &lt; 75,"Small",IF(B6 &lt; = 95,"Medium","Large"))</p> <p>Nested IF (2 tiers with correct number of closing brackets) – 1 mark</p> <p>IF B6 &lt; 75</p> <p>Returns Small – 1 mark</p> <p>IF B6 &lt; = 95 – 1 mark</p> <p>Returns Medium – 1 mark</p> <p>IF B6 &gt; 95 returns Large – 1 mark</p> <p>No absolute cell referencing – 1 mark</p>	6
6(b)	<p><b>Four from:</b></p> <p>Waist sizes would be typed into column B</p> <p>These would then be rounded in column C...</p> <p>...using a formula in C6...</p> <p>...such as ROUND(B6, 0) <b>or</b> INT(B6)</p> <p>B6 in the formula would need to be changed to C6</p> <p>to give = IF(C6 &lt; 75,"Small",IF(C6 &lt; = 95,"Medium","Large")) – 2 marks for fully correct formula.</p>	4

Question	Answer	Marks
7	<b>Three matched pairs:</b>	
	Examining documents <u>used in the system</u>	<b>1</b>
	Benefit – Helps to identify the inputs and outputs of the system/volume of data can be determined/processing can be deduced	<b>1</b>
	Interview <u>system users</u>	<b>1</b>
	Benefit – Interviewer can move away from their 'script' and ask a more in-depth question if a particular response is given/can interpret body language	<b>1</b>
	Can distribute questionnaires to <u>system users</u>	<b>1</b>
	Benefit – Answers tend to be, on the whole, more accurate/everyone can complete the questionnaire at the same time instead of one after the other (as with interviews)/can complete it at their leisure	<b>1</b>

Question	Answer	Marks
8	<p><b>Six from:</b></p> <p>When data flows from or to somebody or somewhere outside the system, that somebody or somewhere is called a terminator/external entity  Here the terminator/external entity could be the GP/family doctor  The processing of patient data is put in a process box  The actual data output from the system, is recorded for future use  Such data is therefore called a store...  ...such as the treatment received by a patient  Each flow arrow is labelled to show what data is flowing at that point in the diagram  The label might be the patient's treatment.</p>	<b>6</b>

Question	Answer	Marks
9	<p><b>Six from:</b></p> <p>Hospital workers have a personal duty of confidence to individuals whose data is stored</p> <p>Hospital workers should have a personal duty of confidence to their employer</p> <p>Workers must not tell any unauthorised person about personal data which is held</p> <p>Hospital must not use information for any reason except with the permission of the individual</p> <p>Workers must be asked to treat the information as confidential/it must be obvious to them that the information is given in confidence</p> <p>Hospital should ask employee to sign a confidentiality agreement</p> <p>Hospital should take responsibility for any information which is passed on</p> <p>Only the least amount of information that could identify the individual should be used</p> <p>Information should not be passed on from organisation to organisation without authorisation from the individual</p> <p>Anonymised information should always omit personal details wherever possible</p> <p>Aggregated information should never identify individuals</p> <p>Hospital/workers must ensure the security of customer data</p> <p>Workers must ensure only relevant data is used</p> <p>Workers should ensure they only use up to date/accurate information.</p>	6

Question	Answer	Marks
10	<p><b>Five from:</b></p> <p>Select suitable data</p> <p>...including normal, abnormal and extreme data</p> <p>Expected results and actual results are recorded</p> <p>Actual and expected results are compared</p> <p>Comments on comparison are recorded/comments are made as to whether system needs to be changed or otherwise</p> <p>Live data could be used</p> <p>Comparison between actual results and previous system results.</p>	5

Question	Answer	Marks
11(a)	<p><b>Three from:</b></p> <p>There are personal/private (users' own) calendars and public calendars  Open her private calendar to see when he is free  Open the public calendar showing when other workers are free  Identify a suitable time when he is free and when others are free/where there are no clashes  Notify the programmers of the time and date of the meeting  Calendar software would advise him of any clashes  Pietr would type in the details of the meeting  Pietr sets an alarm to alert him when the meeting starts  Calendar function keeps a record of appointments and meeting times.</p>	<b>3</b>
11(b)	<p><b>Five from:</b></p> <p>Identifying short- and long-term targets  Set deadlines for the completion of each task  Can set the relative importance of each target  Helps to devote appropriate resources/workers (to achieving that target)  Helps in planning the steps needed to produce a solution  Using Gantt charts...  ...to represent parallel and sequential tasks...  ...to help ensure sequential tasks are completed in time for the next one  ...to help ensure parallel tasks finish at the same time  Helps in making correct decisions which will affect the time taken at each stage  Helps to arrange workload  Can monitor progress by seeing how long a task has taken so far/see how long tasks should take.</p>	<b>5</b>

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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/31**

Paper 3 Written B

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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Question	Answer	Marks
1(a)	Signal is switched on/off/in pulses to represent the code being sent.	1
1(b)	<b>Two from:</b>  Line of sight only so will not affect other devices in home/building Short distance so will not interfere with other devices Short distance so uses very little (electrical) power.	2
1(c)	<b>Two from:</b>  Games controller/joystick to navigate/play using buttons/paddles Use of touchscreen with 'app' on smartphone to replicate navigation features Microphone for entering voice commands Keyboard/pad for entering alphanumeric characters/user names/id/password.	2

Question	Answer	Marks
2(a)	<p><b><i>Eight from e.g.:</i></b></p> <p>Has WAN and LAN ports for connection of (W)LAN to internet          USB ports to allow sharing of (multimedia) files          Has multiple NICs, for connection to different networks/internet          ...support 10/100/1000 Mbit<sup>s</sup> networks          Act as gateway between networks          ...provides ADSL/cable connection to WAN          ...provides routing tables/'default' gateway          Combines function of router and WAP          Has wireless NIC          ...to allow/provide use of Wi-Fi          ...to provide use of 2.4/5Ghz wireless bands          Provides security facilities for network          ...Wi-Fi security facilities          ...one touch connection for wireless peripherals e.g. Printer          Provides DHCP functions          ...to allow automatic provision of addressing for connected devices          Has web-based administration interface          ...allows user to configure the router          Uses open-source/Linux operating system for ease of update/customisation          Wi-Fi clone facility to add WAPs          Provides USB interface for use of flash memory devices/external storage devices as NAS.</p>	<b>8</b>
2(b)	<p><b><i>Six from:</i></b></p> <p>Traffic sent as IP packets from device          ...packet contains destination in header          Device looks up destination IP in its DNS table          ...if IP address not known sends packet to 'default' gateway/router address          ...if known sends packet to IP address          Router examines packet header          ...to determine destination IP address          ...looks up IP address from DNS server          ...if IP address not known sends packet to another router          ...if IP address known sends packet to IP address of server.</p>	<b>6</b>

Question	Answer	Marks
3(a)	<p><b>Four from e.g.:</b></p> <p>Signal is spread over a number of frequencies within the band  ...frequency hopping is where carrier frequency is rapidly switched  ...using a code known to both transmitter and receiver  Uses a pseudorandom number generator to produce the codes  ...direct spread where signal is spread over a range of frequencies  ...centred on the main/nominal frequency  Can be a mixture of frequency hopping and direct spread.</p>	<b>4</b>
3(b)	<p><b>Six from:</b></p> <p>Increased resistance to interference  Increased resistance from 'jamming'  Increased bandwidth  Increased resistance to eavesdropping/interception  Increased resistance to multi-path reflections/fading  Allows multiple users/access by multiple devices  Can transmit on same frequency as others by using different code  Limits power density so safer to use.</p>	<b>6</b>
3(c)	<p><b>One from:</b></p> <p>Bluetooth  GPS.</p>	<b>1</b>
4	<p><b>Six from:</b></p> <p>Knowledge base has many individual items of information/facts that need updating so each item interacts with many other items during reasoning  ...difficult to check all/every interaction  Knowledge base objects are inter-dependent so modifying/updating one will affect another  ...creating a need for more modifying  Inferences/reasoning carried out during processing is not easily observed  ...system makes inferences as processing occurs and changes/adds facts  ...so changes may affect reasoning in unknown ways  Changes may cause other changes to be made which may create need for more changes.</p>	<b>6</b>



Question	Answer	Marks
5	<p><b>Six from:</b></p> <p>Examine patient to determine symptoms/collect data  Enter symptoms/data into expert system via user interface  Collect symptoms via sensors attached to patient  Doctor/patient enters answers to questions into user interface  Expert system searches knowledge base for match with symptoms/data  Inference engine uses rules base  ...to add data to working memory  ...to use rules/conditions to find match for symptoms/data  ...to add data that could trigger use of more rules  ...use of forward/backward chaining to match conditions/data  ...to produce list of probable/possible/suggested diagnoses/illnesses  Results presented via user interface to doctor/patient as hardcopy/on screen  Doctor uses results and own knowledge to make diagnosis.</p>	6
6	<p><b>Eight from:</b></p> <p><i>Advantages of e.g.:</i>  Email has an audit trail for record keeping  Email can be answered/replied to at different times/at doctor's convenience  Email can have files attached for others to consult  Chat rooms are in real time/discussions are in real time  Chat rooms mean doctors do not have to travel to talk to others  Instant messaging is in (almost) in real time/discussions are in (almost) real time  Instant messaging allows doctors to do other tasks  Video chat/conferencing can reduce costs of visits to other doctors/meetings  Video chat/conferencing can be used to replace meetings where doctors have to travel</p> <p><i>Disadvantages of e.g.:</i>  Email is not secure  Emails may not be delivered  Emails can be ignored  Chat rooms can hide/do not necessarily show doctors identity  Instant messaging does not allow time to consider the message before it is sent  Instant messaging can easily be misused  Video chat/conferencing reduces personal interaction  Video chat/conferencing can be affected by technical issues/different time zones.</p> <p><i>Max 6 marks for all advantages or all disadvantages.  One mark available for a reasoned conclusion.</i></p>	8

Question	Answer	Marks
7	<p><b>Six from:</b></p> <p>Attach sensors/named sensors to patient  ...connect sensors to computer system  ...via ADC/convert analogue signals to digital  Computer continually reads/stores data from sensors  ...processes data for display  ...compares data to pre-set values  Data output/displayed on screen for doctors/nurses to watch  ...accompanying sounds to reassure monitoring staff that all is well  ...hardcopy produced  ...stored data used for analysis/comparison over time  ...alerts/alarms sounded if pre-set parameters exceeded.</p>	6
8	<p><b>Six from:</b></p> <p>Web browser uses HTTPS  Website operator/owner acquires/has a certificate from a certificate provider  ...using a certificate signing request  Digital identity certificate provides a public key  ...holds website owner name/information  ...website owner email address  Certificate provider has checked that the website owner has authority to use website address/domain  Certificate provider signs certificate and provides a public document  Web browser is sent digital certificate when it accesses website  Web browser reads certificate information  ...uses public key to decrypt certificate  ...checks against built-in list of trusted/root certificates  ...if certificate is valid then web site is authenticated  ...if certificate is not valid user is given popup warning that site has not been authenticated.</p>	6

Question	Answer	Marks
9(a)	<p><b>Four from:</b></p> <p>At least 8 characters long            Contains characters mixture of uppercase/lowercase/numbers            ...keyboard characters/symbols not defined as numbers or letters            Does not contain a complete word or phrase            Is different from previous passwords            Does not relate to the user/contain the user name            Does not repeat characters too often.</p>	<b>4</b>
9(b)	<p><b>Four from:</b></p> <p>Users may write down passwords in accessible places if...            ...passwords are excessively complex            ...required to be changed too frequently            Users may have too many passwords to manage            ...so may use same password for all accounts            Users may choose weak passwords if not allowed to write down password            Special characters may prove difficult to use if travelling in different countries/keyboards            Identity management systems may require one password to access all others            ....the master password may be easily found by hackers/social engineering techniques.</p>	<b>4</b>
10	<p><b>Four from:</b></p> <p>Basic requirements are identified            ...input and outputs determined            Initial/first prototype developed            ...only includes user interfaces            Customers/end-users examine the prototype            ...provide feedback on additions or changes            Prototype is revised/enhanced            ...based on user feedback            Prototype build and end user examination may be repeated.</p>	<b>4</b>

Question	Answer	Marks
11	<p><b>Six from:</b></p> <p><i>Benefits include e.g.</i>  Reduced costs of development  Reduced time of development  ...as any changes are made during development  Increased user involvement  ...fewer misunderstandings/interpretations of design  ...final product more likely to satisfy the end-user  Can experiment with prototype before building final product</p> <p><i>Drawbacks include e.g.</i>  Analysis of requirements can be inadequate  ...complete project may not be analysed  ...better solutions may be overlooked  Confusion of end user over what is actually wanted/required  ...developer and end user may have different ideas of what end product should be  Excessive time spent on developing prototype  ...prototype may become too complex  ...not meet end user requirements</p> <p><i>Max 5 marks for all benefits or all drawbacks.  One mark available for a reasoned conclusion.</i></p>	<b>6</b>
	<b>Total:</b>	<b>80</b>

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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/32**

Paper 3 Written B

**May/June 2017**

MARK SCHEME

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Question	Answer	Marks
1	<p><b>Six from:</b></p> <p>Assist in bridging the gap between concept and actual design            Because nuclear reactions can only be simulated not tested (by international agreements)            So that simulations can be run at atomic level of reactions            ...test results can be rerun at reduced speed of the reaction            ...3D modelling of nuclear reactions cannot be done otherwise            Allows modelling of the radiation shielding components            (because use of simulations is) safer than performing the tests for real            ...extreme conditions can be tested            (because use of simulations is) cheaper than real testing/using <u>of nuclear materials/hardware</u>            (because use of simulations allows) tests to be repeated more easily with differing variables.</p>	6
2(a)	<p><b>Six from:</b></p> <p><b>Benefits:</b>            Have extremely/very high processing power/fast processing speed            ...so that the simulation is completed in suitable time/without buffering            Carry out very many tasks simultaneously            Vast amount of data has to be processed            ...which would take too long if carried out by human/non-super computer            Large number of rules/parameters to be processed</p> <p><b>Drawbacks:</b>            Expensive to build/create/maintain            ...supporting infrastructure is expensive to create/maintain/power costs are expensive            Requires specialist support personnel            ...specialists are expensive to pay/hire            Maybe difficult to book/rent use of/time on super computer.</p> <p><i>Max 5 for all benefits or all drawbacks.</i></p>	6
2(b)	<p><b>Two from e.g. :</b></p> <p>Use in weather forecasting            Track space and ocean parameters            Simulations of human brain/artificial intelligence            Breaking of encryption by national security/intelligence agencies            Calculating ballistic missile/space vehicle trajectories            Use in online computer gaming            Use in medical research for e.g. cancer research/DNA studies.</p>	2

Question	Answer	Marks
3	<p><b>Five from:</b></p> <p>Provides a visual representation that is easy to understand</p> <p>Shows an accurate timeline</p> <p>Breaks down the project structure</p> <p>Shows how each task relates to the others</p> <p>Shows sequential tasks</p> <p>Shows parallel tasks</p> <p>Shows what the various activities are</p> <p>Shows how long each activity is scheduled to last</p> <p>Show where activities overlap with other activities, and by how much</p> <p>Shows when each activity begins and ends</p> <p>Shows start and end dates of the whole project</p> <p>Shows schedule on day to day basis</p> <p>Shows the critical path</p> <p>Shows milestones</p> <p>Allows resource planning</p> <p>...staff deployment</p> <p>...materials allocations.</p>	5
4(a)	<p><b>Two from:</b></p> <p>Searches/queries can find the required records</p> <p>So letters will go to the right place/address</p> <p>Residents might not receive the (important) letters</p> <p>Residents might be angry if their names were spelled incorrectly</p> <p>An inaccurate demographic picture might be created if the details are inaccurate.</p>	2
4(b)(i)	<p><b>Four from:</b></p> <p>Only using the data for a single purpose/only for the letters</p> <p>Few people may live in the area therefore all the records are/can be stored in one file</p> <p>Database is easy to understand/maintain using standard office applications</p> <p>Simple sorting/filtering/queries can be carried out</p> <p>Data can easily be exported/extracted to e.g. spreadsheet/tables in word processed documents</p> <p>Do not need specialist staff to operate/maintain the database.</p>	4

Question	Answer	Marks
4(b)(ii)	<p><b>Six from e.g.:</b></p> <p>Data is stored only once reduced/no data duplication so letters are only sent once/one per person/household</p> <p>Storage of data is more efficient because data can be entered/found/extracted faster/quicker</p> <p>Data can easily be modified/deleted</p> <p>Data structure is independent of the purpose</p> <p>Complex queries can be carried out so letters are sent to individuals living at same address</p> <p>Data can be extracted from many tables at once</p> <p>Greater security of data/details of recipients of letters</p> <p>Some tables can be restricted</p> <p>Database can be expanded more easily</p> <p>Tables can be added</p> <p>Many users can access the database at the same time.</p>	<b>6</b>
5	<p><b>Eight from e.g.:</b></p> <p>Description of the use of one named sensor in monitoring the environment (Analogue) data sent to ADC/computer</p> <p>...to convert data from analogue to digital</p> <p>...so computers can read/understand the data</p> <p>Computers stores/records data/data logging</p> <p>Continual monitoring/continuous monitoring</p> <p>Data used to create reports</p> <p>Reports displayed on screen as live data/in real time</p> <p>...in graphs/charts/tables automatically</p> <p>...alerts if parameter exceeds pre-set values</p> <p>...to try and ensure that parameter is within desired values</p> <p>...reports in hardcopy</p> <p>...extracted for analysis</p> <p>...data sent to other institutions for research/action following an alert.</p>	<b>8</b>
6(a)	<p><b>Two from:</b></p> <p>Use a software application/'soft' phone on a networked device/ smartphone/computer</p> <p>Using an adapter with a 'normal' analogue telephone to connect to an IP network.</p>	<b>2</b>



Question	Answer	Marks
6(b)(i)	<p><b>Four from:</b></p> <p>Calls are not charged based on distance            Phone numbers remain the same wherever the representative is/virtual numbers possible            Can use any computing device            Phone conferencing/multiple callers in one conversation is possible            Use of advanced call features such as call forwarding/            call waiting/voicemail/caller ID/block numbers            Voicemail to email transcription            Simultaneously sharing of images/emoticons.</p>	<b>4</b>
6(b)(ii)	<p><b>Four from e.g.:</b></p> <p>Cannot be used during power outages            Must have a reliable internet/network connection            Voice quality can vary/be poor            ...delays in receiving data packets can make voices difficult to hear            ...make conversations more difficult            Security of call can be difficult/expensive to achieve            Cannot be tracked reliably when making emergency calls            Employees may need training.</p>	<b>4</b>
7(a)	<p><b>Six from:</b></p> <p><b>Hardware:</b>            Video camera/webcam to capture moving images/video for video input            Microphones to capture sounds for audio input            Computer monitor/television/projector for video output            Loudspeakers/earphones/headphones for audio output            Analogue/digital telephone network/LAN/internet for data transmission            Computer/data processing unit to process the data            Network interface cards/router/ to access the network/data transmission medium/internet</p> <p><b>Software:</b>            Operating system/application to provide user interface            Codecs compressing and decompressing            Network software to initiate/maintain the data linkage            Software to transit/receive the data transmission.</p> <p><i>Max 5 for all hardware or all software.</i></p>	<b>6</b>
7(b)	<p><b>Three from:</b></p> <p>To prevent remote participant from hearing own voice            ...after delay leading to confusion            Voice channel can be susceptible to reverberation            ...voices indistinguishable/unintelligible if reverberation too pronounced            'Howling' feedback if intrusive can prevent any conversation from occurring            Improves clarity of call/sound of voices/audio.</p>	<b>3</b>

Question	Answer	Marks
8(a)	<p><b>Six from:</b></p> <p>Easier to communicate visually with more than two participants  Can see all participants simultaneously during conference rather during a phone call  Participants may not be able/wish to physically meet as would have to in face-to-face conference  More control over contributions from participants during conference  ‘Live’ discussions may be required compared to emails/letters  Restores visual communication clues that are absent from phone calls  Non-verbal information can be transferred unlike an ordinary phone call.</p>	<b>6</b>
8(b)	<p><b>Five from e.g.:</b></p> <p>Anxiety when in front of cameras  Behaviour of participants may change when in front of cameras/can be seen  Processing/interpreting information is more difficult than when-face-to-face/eliminates personal contact  Technical problems with e.g. audio/lip sync may interfere with communications  Equipment may be intrusive/non-intuitive to use/may need to be trained  Conferences across (international) time zones may be difficult to arrange.</p>	<b>5</b>
9(a)	<p><b>Four from e.g.:</b></p> <p>Room types e.g. Number of beds/facilities/views/accessibility  Room rates e.g. Deposit required/cancellation options/maximum and minimum length of stay  Check-in times and options e.g. late check in/out  Room amenities available e.g. mini bar/air conditioning  Hotel facilities/amenities e.g. gym/swimming pool/children’s crèche  Hotel information e.g. address/contact details/phone/fax numbers/email addresses/ratings  Local amenities e.g. restaurants/theatre/travel  Travel options to/from hotel/where to find hotel/‘sat nav’ details  Geocode information such as postal address/zip/post code/description of location  Available methods of payment.</p>	<b>4</b>
9(b)	<p><b>Four from e.g.:</b></p> <p>Membership of hotel/hotel company/chain loyalty/discount schemes  ...account number  Employment/company details  Billing address  Disability/accessibility requirements  Personal preferences e.g. room preferences/wake ups  Credit card/payment details  Stay statistics/dates stayed  Number of rooms previously booked  Number of bookings.</p>	<b>4</b>

Question	Answer	Marks
9(c)	<p><b>Three from e.g.:</b></p> <p>Expected daily arrivals/check-in details showing which guests/type of guests/guest demographic</p> <p>Periodic/weekly/monthly/annual reservation numbers showing peak/quiet periods</p> <p>Summary of guest types e.g. leisure/business/nationality</p> <p>Room rate updates/variance/deals/special offers.</p>	<b>3</b>
	<b>Total:</b>	<b>80</b>

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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/33**

Paper 3 Written B

**May/June 2017**

MARK SCHEME

Maximum Mark: 80

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**Published**

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.

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Question	Answer	Marks
1(a)	Signal is switched on/off/in pulses to represent the code being sent.	1
1(b)	<b>Two from:</b>  Line of sight only so will not affect other devices in home/building Short distance so will not interfere with other devices Short distance so uses very little (electrical) power.	2
1(c)	<b>Two from:</b>  Games controller/joystick to navigate/play using buttons/paddles Use of touchscreen with 'app' on smartphone to replicate navigation features Microphone for entering voice commands Keyboard/pad for entering alphanumeric characters/user names/id/password.	2

Question	Answer	Marks
2(a)	<p><b><i>Eight from e.g.:</i></b></p> <p>Has WAN and LAN ports for connection of (W)LAN to internet          USB ports to allow sharing of (multimedia) files          Has multiple NICs, for connection to different networks/internet          ...support 10/100/1000 Mbit<sup>s</sup> networks          Act as gateway between networks          ...provides ADSL/cable connection to WAN          ...provides routing tables/'default' gateway          Combines function of router and WAP          Has wireless NIC          ...to allow/provide use of Wi-Fi          ...to provide use of 2.4/5Ghz wireless bands          Provides security facilities for network          ...Wi-Fi security facilities          ...one touch connection for wireless peripherals e.g. Printer          Provides DHCP functions          ...to allow automatic provision of addressing for connected devices          Has web-based administration interface          ...allows user to configure the router          Uses open-source/Linux operating system for ease of update/customisation          Wi-Fi clone facility to add WAPs          Provides USB interface for use of flash memory devices/external storage devices as NAS.</p>	<b>8</b>
2(b)	<p><b><i>Six from:</i></b></p> <p>Traffic sent as IP packets from device          ...packet contains destination in header          Device looks up destination IP in its DNS table          ...if IP address not known sends packet to 'default' gateway/router address          ...if known sends packet to IP address          Router examines packet header          ...to determine destination IP address          ...looks up IP address from DNS server          ...if IP address not known sends packet to another router          ...if IP address known sends packet to IP address of server.</p>	<b>6</b>

Question	Answer	Marks
3(a)	<p><b>Four from e.g.:</b></p> <p>Signal is spread over a number of frequencies within the band  ...frequency hopping is where carrier frequency is rapidly switched  ...using a code known to both transmitter and receiver  Uses a pseudorandom number generator to produce the codes  ...direct spread where signal is spread over a range of frequencies  ...centred on the main/nominal frequency  Can be a mixture of frequency hopping and direct spread.</p>	<b>4</b>
3(b)	<p><b>Six from:</b></p> <p>Increased resistance to interference  Increased resistance from 'jamming'  Increased bandwidth  Increased resistance to eavesdropping/interception  Increased resistance to multi-path reflections/fading  Allows multiple users/access by multiple devices  Can transmit on same frequency as others by using different code  Limits power density so safer to use.</p>	<b>6</b>
3(c)	<p><b>One from:</b></p> <p>Bluetooth  GPS.</p>	<b>1</b>
4	<p><b>Six from:</b></p> <p>Knowledge base has many individual items of information/facts that need updating so each item interacts with many other items during reasoning  ...difficult to check all/every interaction  Knowledge base objects are inter-dependent so modifying/updating one will affect another  ...creating a need for more modifying  Inferences/reasoning carried out during processing is not easily observed  ...system makes inferences as processing occurs and changes/adds facts  ...so changes may affect reasoning in unknown ways  Changes may cause other changes to be made which may create need for more changes.</p>	<b>6</b>

Question	Answer	Marks
5	<p><b>Six from:</b></p> <p>Examine patient to determine symptoms/collect data  Enter symptoms/data into expert system via user interface  Collect symptoms via sensors attached to patient  Doctor/patient enters answers to questions into user interface  Expert system searches knowledge base for match with symptoms/data  Inference engine uses rules base  ...to add data to working memory  ...to use rules/conditions to find match for symptoms/data  ...to add data that could trigger use of more rules  ...use of forward/backward chaining to match conditions/data  ...to produce list of probable/possible/suggested diagnoses/illnesses  Results presented via user interface to doctor/patient as hardcopy/on screen  Doctor uses results and own knowledge to make diagnosis.</p>	6
6	<p><b>Eight from:</b></p> <p><i>Advantages of e.g.:</i>  Email has an audit trail for record keeping  Email can be answered/replied to at different times/at doctor's convenience  Email can have files attached for others to consult  Chat rooms are in real time/discussions are in real time  Chat rooms mean doctors do not have to travel to talk to others  Instant messaging is in (almost) in real time/discussions are in (almost) real time  Instant messaging allows doctors to do other tasks  Video chat/conferencing can reduce costs of visits to other doctors/meetings  Video chat/conferencing can be used to replace meetings where doctors have to travel</p> <p><i>Disadvantages of e.g.:</i>  Email is not secure  Emails may not be delivered  Emails can be ignored  Chat rooms can hide/do not necessarily show doctors identity  Instant messaging does not allow time to consider the message before it is sent  Instant messaging can easily be misused  Video chat/conferencing reduces personal interaction  Video chat/conferencing can be affected by technical issues/different time zones.</p> <p><i>Max 6 marks for all advantages or all disadvantages.  One mark available for a reasoned conclusion.</i></p>	8



Question	Answer	Marks
7	<p><b>Six from:</b></p> <p>Attach sensors/named sensors to patient  ...connect sensors to computer system  ...via ADC/convert analogue signals to digital  Computer continually reads/stores data from sensors  ...processes data for display  ...compares data to pre-set values  Data output/displayed on screen for doctors/nurses to watch  ...accompanying sounds to reassure monitoring staff that all is well  ...hardcopy produced  ...stored data used for analysis/comparison over time  ...alerts/alarms sounded if pre-set parameters exceeded.</p>	6
8	<p><b>Six from:</b></p> <p>Web browser uses HTTPS  Website operator/owner acquires/has a certificate from a certificate provider  ...using a certificate signing request  Digital identity certificate provides a public key  ...holds website owner name/information  ...website owner email address  Certificate provider has checked that the website owner has authority to use website address/domain  Certificate provider signs certificate and provides a public document  Web browser is sent digital certificate when it accesses website  Web browser reads certificate information  ...uses public key to decrypt certificate  ...checks against built-in list of trusted/root certificates  ...if certificate is valid then web site is authenticated  ...if certificate is not valid user is given popup warning that site has not been authenticated.</p>	6

Question	Answer	Marks
9(a)	<p><b>Four from:</b></p> <p>At least 8 characters long            Contains characters mixture of uppercase/lowercase/numbers            ...keyboard characters/symbols not defined as numbers or letters            Does not contain a complete word or phrase            Is different from previous passwords            Does not relate to the user/contain the user name            Does not repeat characters too often.</p>	<b>4</b>
9(b)	<p><b>Four from:</b></p> <p>Users may write down passwords in accessible places if...            ...passwords are excessively complex            ...required to be changed too frequently            Users may have too many passwords to manage            ...so may use same password for all accounts            Users may choose weak passwords if not allowed to write down password            Special characters may prove difficult to use if travelling in different countries/keyboards            Identity management systems may require one password to access all others            ....the master password may be easily found by hackers/social engineering techniques.</p>	<b>4</b>
10	<p><b>Four from:</b></p> <p>Basic requirements are identified            ...input and outputs determined            Initial/first prototype developed            ...only includes user interfaces            Customers/end-users examine the prototype            ...provide feedback on additions or changes            Prototype is revised/enhanced            ...based on user feedback            Prototype build and end user examination may be repeated.</p>	<b>4</b>

Question	Answer	Marks
11	<p><b>Six from:</b></p> <p><i>Benefits include e.g.</i>  Reduced costs of development  Reduced time of development  ...as any changes are made during development  Increased user involvement  ...fewer misunderstandings/interpretations of design  ...final product more likely to satisfy the end-user  Can experiment with prototype before building final product</p> <p><i>Drawbacks include e.g.</i>  Analysis of requirements can be inadequate  ...complete project may not be analysed  ...better solutions may be overlooked  Confusion of end user over what is actually wanted/required  ...developer and end user may have different ideas of what end product should be  Excessive time spent on developing prototype  ...prototype may become too complex  ...not meet end user requirements.</p> <p><i>Max 5 marks for all benefits or all drawbacks.  One mark available for a reasoned conclusion.</i></p>	<b>6</b>
	<b>Total:</b>	<b>80</b>