

Mark Scheme (Results)

June 2012

GCE Applied ICT (6953)
The Knowledge Worker

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Activity	ANSWER	POSS. MARK	MAX
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Activity 1	Understanding the situation		
(a)	Marks given for first 15 points only Any 15 of		
A1	At least 1 pit stop		1
A2	Less than 5 pit stops		1
A3	Weight of car and driver ≥ 640 kg (at the end of the race)		1
A4	Ballast added (to attain weight)		1
A5	Ballast added only at start of race		1
A6	Driver weight 1 61 kg		1
A7	Driver weight 2 53 kg		1
A8	Car weight 560 kg		1
A9	Tank capacity 250 <u>litres</u>		1
A10	4 Tyre types (A-D)		1
A11	A <u>fastest</u> but <u>doesn't last very long</u> (need both)		1
A12	D <u>slowest</u> but <u>lasts longer</u> (need both)		1
A13	B and C are in between		1
A14	Tyre choice nomination for race		1
A15	1 tyre choice throughout race		1
A16	Number of laps	Approximately 395 km for 1 (E) mark	1
A17	Length of lap		1
			(15)
(b)			
B1	Tyre Choice		1
B2	Number of pit stops		1
B3	When pit stops occur		1
B4	Amount of fuel at <u>start</u> and <u>pit stops</u>		1
B5	Amount of ballast		1
			(5)
Total Marks for Activity 1			20

Activity	ANSWER	POSS. MARK	MAX
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Activity 2	Sources of information <u>Circumstances and conditions during the testing</u>		
	Any 4 of		
A1	Wind speed is different in testing than in race	Affects the car's speed	1,1
A2	Temperature (of track) is different in testing than in race	Changes the grip on tyre	1,1
A3	Overall weight of car (inc driver, fuel, ballast) is different	Heavier cars go slower	1,1
A4	Driver's skill / style	Driver might not be as quick as the actual drivers / might impact on tyre wear	1,1
A5	Other cars may get in the way during testing /	Changes the lap time	1,1
A6	Manufacturing process	Minor differences in the performance of particular types of tyres	1,1
A7	Inaccurate measurements during testing	Might be using a hand held stop watch	1,1
A8	State of engine tuning is different in testing than in race	May not be as highly tuned as for the race	1,1
A9	Amount of fuel left in tank	Affects weight of car and speed	1,1
A10	Incident causing a delay <u>during testing</u> - yellow flag , dust, oil, debris on track, etc	Affects the pace of the car	1,1
A11	Rain /fog	More slippery, driver will slow down	1,1
A12	Problem with test car making it run differently	May have poor times	1,1
A13	Tyres only have to last 10 laps in testing	May need to last longer in a race - poorer lap times	1,1
A14	Slower pit stops in testing	Impacts on race strategy	1,1
A15	Anything sensible if justified		2
			(8)
Total Marks for Activity 2			8

Activity	ANSWER	POSS. MARK	MAX
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Activity 3	Computer modelling Columns A-H, rows 8-21						
(a)	Stats						
A1	Track details correct				1		
	Length	5.8	km				
	Lap record	01:23.3	mm:ss.0				
	Race laps	68					
	Average pit stop delay	31.20	secs				
A2	Car details correct				1		
	Car weight	560	kg				
	Fuel consumption	0.75	l/km				
	Fuel capacity	250	l				
A3	Regulations correct				1		
	Minimum car weight	640	kg				
A4	Weights correct				1		
	Driver weight	61	kg				
	Fuel weight	0.7	kg/l				
A5	Test Data correct				1	(5)	
		Tyre A	Tyre B	Tyre C			Tyre D
	Base lap	80.13	81.81	83.21			84.021
	Degradation	1.193	1.1158	1.0335	1.0275		

Activity	ANSWER	POSS. MARK	MAX
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(b) Lap Times Print: Columns E, F and I, rows 9-15			
B1	Working formula in E9 (=D9*Stats!\$B\$16) (allow if no absolute addressing)	1	
B2	Absolute Addressing Used (must be on the row number at least)	1	
B3	Replicated correctly – do not award unless B2 is awarded	1	
B4	Working formula in F9 (=Stats!\$B\$13+Stats!\$B\$14+Stats!\$B\$15+E9) OR (=SUM(Stats!\$B\$13:\$B\$15)+'Lap Times'!E9) OR variation	1	
Formula in F10 (=IF(B10="Finished",F9,Stats!\$B\$13+Stats!\$B\$14+Stats!\$B\$15+E10)) OR (=IF(B10<>"Finished",F9-(Stats!\$B\$16*G9),'Lap Times'!F9))			
B5	Correct Condition(B10="Finished") allow reverse condition	1	
B6	Correct True Value (F9)	1	
B7	Working false formula (Stats!\$B\$13+Stats!\$B\$14+Stats!\$B\$15+E10) allow without absolute addressing	1	
B8	Correct absolute addressing	1	
B9	Bonus for complete correct formula (=IF(B10="Finished",F9,Stats!\$B\$13+Stats!\$B\$14+Stats!\$B\$15+E10) allow reverse condition	1	
B10	Replicated correctly (allow follow through if absolute addressing included)	1	
Formula in I 10 =IF(B10="Finished",0,I9+H10)			
B11	Condition correct (B10="Finished") allow reverse	1	
B12	True and False Values correct (0,I9+H10)	1	
B13	Bonus for completely correct (=IF(B10="Finished",0,I9+H10))	1	
B14	Replicated correctly – only award if B13 awarded	1	(14)

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(c) Summary (Formulae) Columns B-H, rows 10-21			
C1	Correct formula in cell F12 (=E12-E11) (alt: =IF(B12="yes", E12-E11,0)	1	
C2	Replicated correctly down to F15 (ignore F16)	1	
C3	Correct formula in B21 for final weight of car (= 'Lap Times'!F84)	1	
C4	Formula in G21 =MAX('Lap Times'!I9:I84) or ='Lap Times'!I76	1	
C5	Bonus if formula would work for a different number of laps (MAX)	1	
C6	Formula in H21 =MAX('Lap Times'!\$J\$9:\$J\$84) OR = G21/86400 OR =Summary!G21/(60*60*24) OR ='Lap Times'!J76	1	
			(6)

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(d)	Summary (Data)		
D1	Solution Showing – at least one pit stop, tyre choice, and stopping laps for all pit stops, fuel added at least one pit stop	1	(7)
D2	No red warnings (B19 to B21)	1	
D3	B21, G21 and H21 showing non zero values	1	
	D4,D5,D6,D7 marks in this section can only be given if the data in (a) is correct, the formulae in (b) and (c) would work and there are no red warnings.		
D4	Tyre C chosen or Tyre A chosen	1	
D5	Tyre C 2 stops or Tyre A 4 stops chosen	1	
D6	Bonus for Tyre C two stops	1	
D7	Bonus for minimum car weight (B21>640) and ballast less than 19 kg (I8<19)	1	
(e)	Printouts (If screenshots are submitted do not award E marks)		
E1	All required printouts and no others (four worksheets)	1	(7)
E2	In right order (All four worksheets)	1	
E3	Row and Column headings on (at least 2 worksheets)	1	
E4	Gridlines (at least 2 worksheets)	1	
E5	Correct header & footer (at least 2 worksheets)	1	
E6	Correct rows printed (at least 2 worksheets)	1	
E7	Correct columns only printed (must include 'Lap Times')	1	
Total Marks for Activity 3			39

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Activity 4	Indicative content		
<p>In report format, not a memo or a letter. Suitable title e.g. Report to the management of Patrick Racing. Introduction including statement of decisions to be made. Table of recommendations of tyre choice, pit stops, fuel and ballast. Justifications of recommendation – should mention fastest PREDICTED race time Factors that might impact on model:</p> <ul style="list-style-type: none"> • Temperature • Wind • Driver • Speed of pit stops • Rain • Safety car • Manufacturing standards <p>Graph:</p> <ul style="list-style-type: none"> • Line or Scatter • Used in justification of recommendation • Axes labelled • Graph fit for purpose • Title <p>Conclusion is a summary of recommendations.</p>			
Level	Marks		
Level 0	0 marks	No rewardable content	
Level 1	1-5	<p>The report shows a recommendation although this may not be justified and may be shown in an unclear way. There will be little comment on factors which impact on the model. The candidate will probably have included a chart, although not a graph as requested. It may be a random graph. It may not use the requested data. The candidate uses everyday language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar are used with limited accuracy.</p>	
Level 2	6-10	<p>The report shows a recommendation which is clear, complete and in a table. The candidate has supplied a graph or chart which matches the request, but may not be entirely appropriate. Some attempt has been made to supply strategy recommendations in report form with limited headings. Recommendations are clear in tables which are explained and some attempt has been made at justification. Some will have been made to justify these recommendations, probably just the speed. There will be some factors discussed which impact on the model. The candidate uses some specialist terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar are used with some accuracy.</p>	
Level 3	11-15	<p>The report is set out in a clear way using headings and sub headings. The recommendations are made clearly and the graph supplied is relevant, fit for purpose, well labeled and adds to the content of the report. The recommendations would lead to a good strategy. They have mentioned several factors which may impact upon the model,</p>	

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	these will have been expanded. The candidate uses a range of appropriate specialist terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.		
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Activity 5		Reusing the model ECCCAA		
5	Maximum of 4 marks in any one section.			
	Driver			
A1	More ballast or fuel would be needed for the lighter driver to keep the car legal at end of race.	2	(6)	
A2	She is shorter so may affect aerodynamics (driver of car)/wind resistance	2		
A3	Different driving style may affect wear on the tyres – pit stop strategy	2		
A4	Lighter driver gives you more options with fuel/ballast strategy	2		
A5	Anything sensible	2		
	Circuits			
B1	Lap lengths affect pit stop timings	2		
B2	Climate can affect track performance – tyre choice	2		
B3	Track design / length of pit lane affects pit stop lengths	2		
B4	Track design affects speed and fuel consumption	2		
B5	Different surfaces wear out tyres at the different rate	2		
B6	Anything sensible	2		
Total Marks for Activity 5				6

SWW1	Authenticating Work (All WP pages have task number, Name, centre number).	1	
SWW2	Appropriate Structure (Pages in correct order & Folder assembled correctly)	1	
	Total Marks for Standard Ways of Working		2
	Total for Paper		90

Activity	ANSWER	POSS. MARK	MAX
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