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Cambridge Assessment International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/04**

Paper 4 Advanced Practical **February/March 2023**

MARK SCHEME

Maximum Mark: 90

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.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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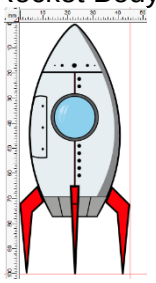
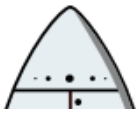
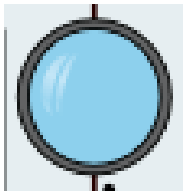
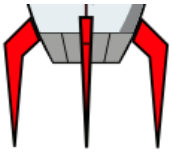
Task	Answer	Marks
See Task 1 below for examples of graphics.		
Rocket Body 	Body – curved, smooth symmetrical sides, fatter middle, horizontal bottom	1
	Body – light grey/blue	1
	Body – Darker shading on right fits body cleanly	1
Rocket cone 	Cone – peaked not sharp, symmetrical, bottom horizontal, fits cleanly	1
	Cone – 5 dark circular rivets, 3 sizes in correct positions	1
Rocket door 	Door shape – outline fits body cleanly – no gap/overlap	1
	Door – 3 dark circular rivets equal size, in line, spaced evenly	1
Rocket window 	Window – concentric circular rims, darker fill, black outline	1
	Window – light blue fill	1
	Window – pale lens flare added – correct position	1
Rocket seam 	Seam – vertical/straight, not through window, line matches/meets cone	1
	Seam – 7 dark circular rivets equal size, 2/5 split, in line, spaced evenly	1
Rocket Fins 	Fins – Right/Left identical, red fill/black line, meets body – in correct place	1
	Fins – central fin shape/same colour, line/elbows/tops in line	1
	Fins – aligned at foot – All 3	1

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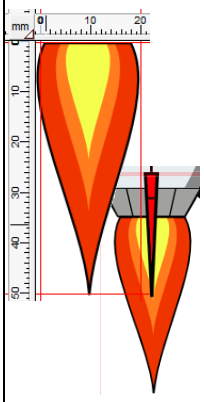
Task	Answer	Marks
Rocket thruster 	Thruster – correct size/shape	1
	Thruster – fits body – colour/outline, 4 complete even divisions	1
Rocket Flame 	Flame – correct 3 colours – Rust/Orange/Yellow	1
	Flame – Outer (only) has thin Black outline Correct symmetrical shape	1
	Flame – meets neatly and fills thruster – all of mid fin visible	1
	Available marks	**20**

Task	Answer	Marks
See task 2 below for animation screenshots		
Stage	Stage – set to 400px by 900px	1
	Stage – Set to dark blue	1
	Stage – stars added in correct position	1
	Stage – all 4 stars remain static throughout	1
	Stage – Gantry added at bottom – remains static throughout	1
Rocket entry and ascent	Rocket – entry point – from left – above halfway	1
	Rocket – orientation – smooth angle to upright during path to the top	1
	Rocket – path to top – 1 movement	1
	Rocket – time to top 1 second	1
	Rocket – partly offstage at the top	1
	Rocket – passes in front of the stars	1

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Task	Answer	Marks
Rocket descent	Rocket – change to a bigger flame during descent stage 1	**1**
	Rocket – change to 3 flames only during descent stage 2	**1**
	Rocket – flame 3 parts are the correct size/shape – maintains size/shape/position	**1**
	Rocket – single flame on landing – must stay – flame must have changed from 3 parts	**1**
	Rocket – single flame duration 1sec after landing – independent	**1**
	Rocket – flame changes (to off) only after landing – the rocket must remain	**1**
	Rocket – descent path is vertical/smooth – the fins meet the ground at the 1st stop	**1**
	Rocket – descent to landing time is 4 seconds – Must land and be static	**1**
Rocket landing	Rocket – remains the same size throughout	**1**
	Stage – Gantry – the rocket is positioned to the right – Covered but no overlap to the left	**1**
	Stage – Gantry – Rocket proportions – the cone is at the top gantry level – (if fully landed)	**1**
	Stage – the gantry is in front of the rocket	**1**
	Animation – The animation does not loop	**1**
	Animation – There is no background reset (stars/gantry move) at any time	**1**
	Available marks	**25**

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Task	Answer	Marks
See task 3 below for spreadsheet screenshots and formulae		
3(a)	Names -Workbook and 1st worksheet are named correctly (**SalesData, SelectPeriod**)	**1**
	Names – 3 ranges are named correctly (**data, day, times**)	**1**
	Dropdown Menu – there are the 3 correct options (Morning, Afternoon, All day)	**1**
	Formulae – an absolute reference is used for **J4**	**1**
	Results – All results are correct for Morning (40, 38, 41 ,43 ,36)	**1**
	Results – All results are correct for Afternoon (19, 19, 18, 17, 12)	**1**
	Results – All results are correct for All day (59, 57, 59, 60, 48)	**1**
3(b)	Names – the 2nd worksheet is named correctly – (**SelectDay**) – Not as a new workbook	**1**
	Worksheet- Cells A1:G14 (only) are copied from the Select Period worksheet	**1**
	A new table is created (I:K) and formatted correctly (centring, fill, bold, colours, gridlines)	**1**
	Dropdown Menu – there are the 5 correct options (Mon, Tue, Wed, Thu, Fri)	**1**
	Results – correct for Mon (40, 19, 59)	**1**
	Results – correct for Tue (38, 19, 57)	**1**
	Results – correct for Wed (41, 18, 59)	**1**
	Results – correct for Thurs (43, 17, 60)	**1**
	Results – correct for Fri (36, 12, 48)	**1**

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Task	Answer	Marks
3(c)	Names – the 3rd worksheet is named correctly – (**SelectAll**)	**1**
	A new table is created (I:K) and formatted correctly (centring, fill, bold, colours, gridlines)	**1**
	Dropdown Menu for Day has the correct 5 options	**1**
	Dropdown Menu for time period has the correct 3 options	**1**
	Results – correct for each day Morning (40, 38, 41, 43, 36)	**1**
	Results – correct for each day Afternoon (19, 19, 18, 17, 12)	**1**
	Results – correct for each day All day (59, 57, 59, 60, 48)	**1**
	Formulae – Efficiency – e.g. All Nested IF()s have 2 levels only	**1**
	Formulae – Efficiency – e.g. SUMIF()/SUMIFS() and IFS() are used	**1**
	Available marks	**25**

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Task	Answer	Marks
See task 4 below for JavaScript and results		
4	Button click populates all total cells	**1**
	Button click totals sales correctly	**1**
	Selection button blanks entries or sets cells to zero	**1**
	Selection button blanks page fully – both entries and totals blanked	**1**
	Page is fully refreshed – accepts new entries	**1**
	<Script> tags correct, in <head> or <body>	**1**
	onclick condition added to Button code/calls function() for totals – *(original line 99)*	**1**
	function() for totals created – *Any name but must match the onclick name*	**1**
	Variables created for – total for am – total for pm – final total	**1**
	am8:pm12 ids, pm1:pm5 ids are used	**1**
	Valid method to convert to numerical values – e.g. .values *1, parseInt(), number()	**1**
	document.getElementById used to display the results	**1**
	document.getElementById**(amtotal**) used	**1**
	document.getElementById(**pmtotal**) used	**1**
	document.getElementById**(total**) used	**1**
	.innerhtml=morning/afternoon/total ***their*** variables used	**1**
	onchange/onclick condition added to Day Selection code – *(original line 25)*	**1**
	onchange calls a function() for clearing the form	**1**
	function() for clearing form is created – the names must match	**1**
	Valid method to create null values for all variables – e.g. value=""	**1**
	Available marks	**20**

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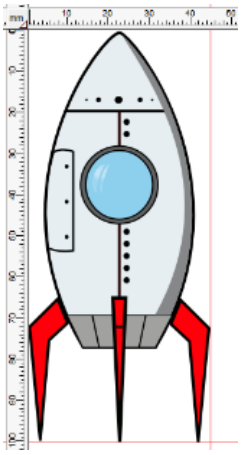
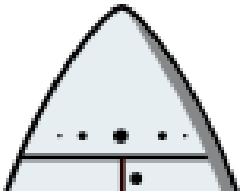
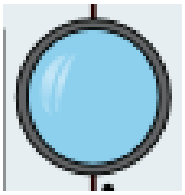
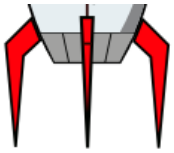
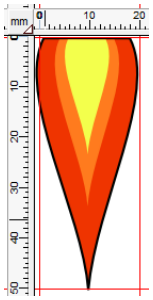
Task 1 – graphics

Body	Cone	Door	Window
			
Body – curved, smooth symmetrical sides, fatter middle, horizontal bottom Body – light grey/blue Body – Darker shading on right fits body cleanly	Cone – peaked not sharp, symmetrical, bottom horizontal, fits cleanly Cone -5 dark circular rivets, 3 sizes in correct positions	Door shape – outline fits body cleanly – no gap/overlap Door – 3 dark circular rivets equal size, in line, spaced evenly	Window – concentric circular rims, darker fill, black outline Window – light blue fill Window – pale lens flare added – correct position
Seam	Fins	Thruster	Flame
			
Seam – vertical/ straight, not through window, line matches/meets cone Seam – 7 dark circular rivets equal size, 2/5 split, in line, spaced evenly	Fins – Right/Left identical, red fill/black line, meets body – in correct place Fins – central fin shape/same colour, line/elbows/tops in line Fins – aligned at foot – All 3	Thruster – correct size/shape Thruster – fits body – colour/outline, 4 complete even divisions	Flame – correct 3 colours- Rust/Orange/Yellow Flame – Outer (only) has thin Black outline – Correct symmetrical shape Flame – meets neatly and fills thruster – all of mid fin visible

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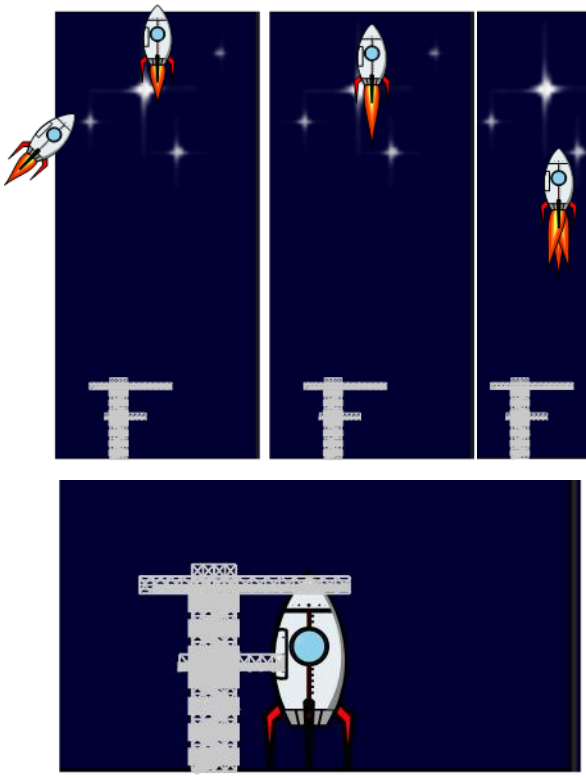
Task 2 – Animation



Note:

- Rocket – entry point – from left – above halfway
- Rocket – partly offstage at the top
- Rocket – change to a bigger flame during descent stage 1
- Rocket – change to 3 flames only during descent stage 2
- Rocket – single flame on landing
- Rocket – flame change (off) only after landing – rocket must remain
- Rocket – remains the same size throughout
- Stage – Gantry – Rocket positioned to right – Covered but no overlap to left
- Stage – Gantry – Rocket proportions – cone at top gantry level – (if fully landed).

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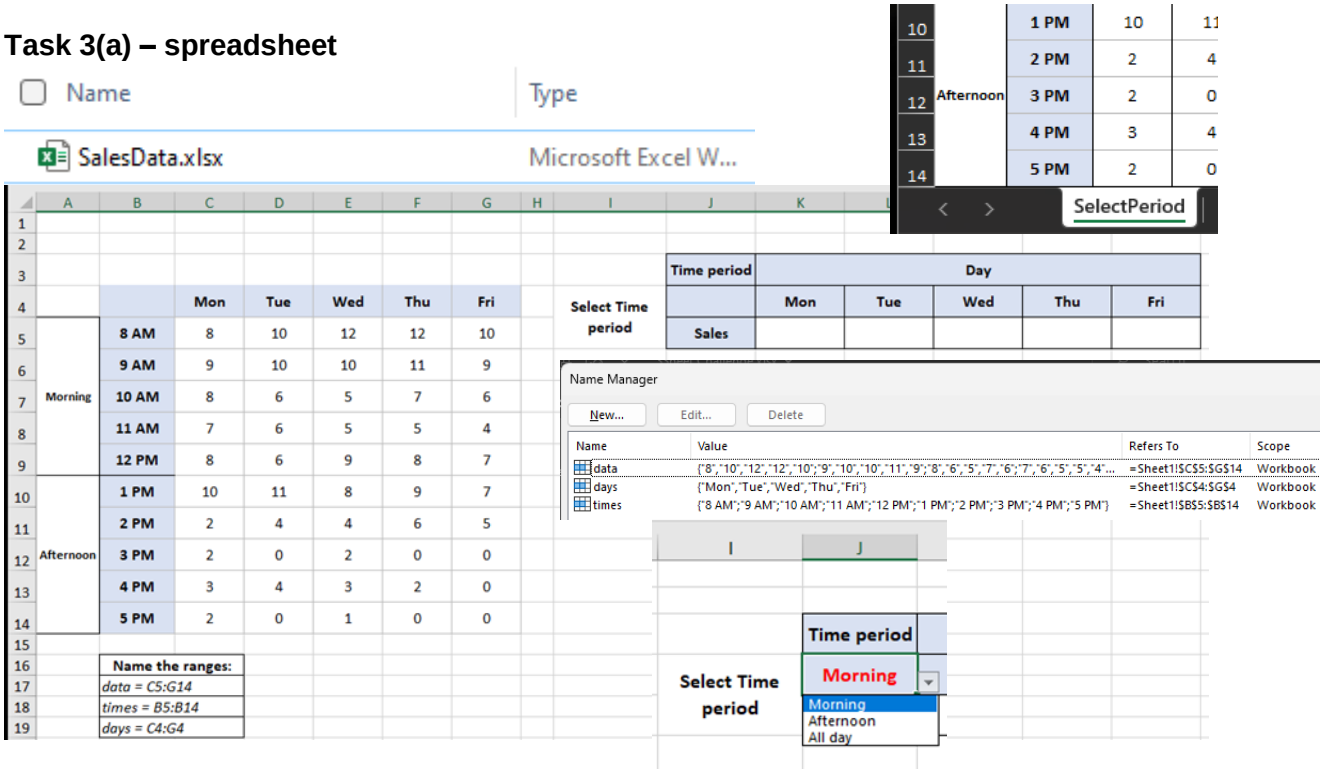
Task 3(a) – spreadsheet



Morning	Mon
Sales	=IF(J4="Morning",SUM(C5:C9),IF(J4="Afternoon",SUM(C10:C14),SUM(C5:C14)))

Time period	Day				
Morning	Mon	Tue	Wed	Thu	Fri
Sales	40	38	41	43	36

Time period	Day				
Afternoon	Mon	Tue	Wed	Thu	Fri
Sales	19	19	18	17	12

Time period	Day				
All day	Mon	Tue	Wed	Thu	Fri
Sales	59	57	59	60	48

3a	Names -Workbook and 1st worksheet are named correctly (**SalesData**, **SelectPeriod**)	1
	Names - 3 ranges are named correctly (**data, day, times**)	1
	Dropdown Menu – there are the 3 correct options (Morning, Afternoon, All day)	1
	Formulae – an absolute reference is used for **J4**	1
	Results - All results are correct for Morning (40, 38, 41 ,43 ,36)	1
	Results - All results are correct for Afternoon (19, 19, 18, 17, 12)	1
	Results - All results are correct for All day (59, 57, 59, 60, 48)	1

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Task – 3(b)

SelectPeriod | SelectDay

Select day	Day	
	Mon	Sales
	Morning	40
	Afternoon	19
	All Day	59

		Mon	Tue	Wed	Thu	Fri
Morning	8 AM	8	10	12	12	10
	9 AM	9	10	10	11	9
	10 AM	8	6	5	7	6
	11 AM	7	6	5	5	4
	12 PM	8	6	9	8	7
Afternoon	1 PM	10	11	8	9	7
	2 PM	2	4	4	6	5
	3 PM	2	0	2	0	0
	4 PM	3	4	3	2	0
	5 PM	2	0	1	0	0

SelectPeriod | SelectDay | SelectAll | Sheet1

Ready

Select day	Day	
	Mon	Sales
	Mon Tue Wed Thu Fri	40
		19
	All Day	59

Day	
Mon	Sales
Morning	=SUMIF(times,"<=12:00",INDEX(data,,MATCH(J4,days,0)))
Afternoon	=SUMIF(times,">12:00",INDEX(data,,MATCH(J4,days,0)))
All Day	=SUM(INDEX(data,,MATCH(J4,days,0)))

Day	
Mon	Sales
Morning	40
Afternoon	19
All Day	59

Day	
Tue	Sales
Morning	38
Afternoon	19
All Day	57

Day	
Wed	Sales
Morning	41
Afternoon	18
All Day	59

Day	
Thu	Sales
Morning	43
Afternoon	17
All Day	60

Day	
Fri	Sales
Morning	36
Afternoon	12
All Day	48

3b	Names – the 2nd worksheet is named correctly - (**SelectDay**) - Not as a new workbook	1
	Worksheet- Cells A1:G14 (only) are copied from the Select Period worksheet	1
	A new table is created (I:K) and formatted correctly (centring, fill, bold, colours, gridlines)	1
	Dropdown Menu - there are the 5 correct options (Mon, Tue, Wed, Thu, Fri)	1
	Results - correct for Mon (40, 19, 59)	1
	Results - correct for Tue (38, 19, 57)	1
	Results - correct for Wed (41, 18, 59)	1
	Results - correct for Thurs (43, 17, 60)	1
	Results - correct for Fri (36, 12, 48)	1

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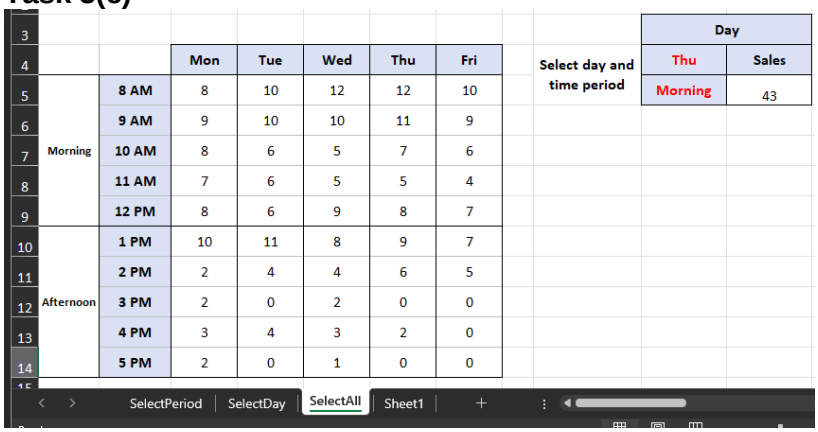
Task 3(c)

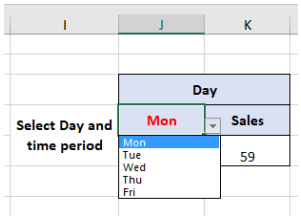


		Mon	Tue	Wed	Thu	Fri
Morning	8 AM	8	10	12	12	10
	9 AM	9	10	10	11	9
	10 AM	8	6	5	7	6
	11 AM	7	6	5	5	4
	12 PM	8	6	9	8	7
Afternoon	1 PM	10	11	8	9	7
	2 PM	2	4	4	6	5
	3 PM	2	0	2	0	0
	4 PM	3	4	3	2	0
	5 PM	2	0	1	0	0

Select day and time period

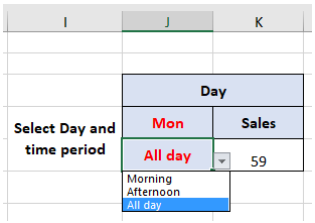
Day	
Thu	Sales
Morning	43

SelectPeriod | SelectDay | SelectAll | Sheet1



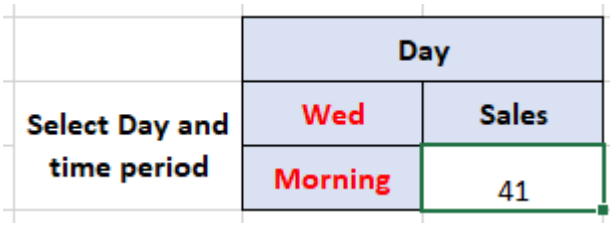
Select Day and time period

Day	
Mon	Sales
Mon Tue Wed Thu Fri	59



Select Day and time period

Day	
Mon	Sales
All day	59
Morning Afternoon All day	



Select Day and time period

Day	
Wed	Sales
Morning	41

	Mon	Tue	Wed	Thu	Fri
Morning	40	38	41	43	36
Afternoon	19	19	18	17	12
Whole day	59	57	59	60	48

3c	Names – the 3rd worksheet is named correctly - (**SelectAll**)	1
	A new table is created (I:K) and formatted correctly (centring, fill, bold, colours, gridlines)	1
	Dropdown Menu for Day has the correct 5 options	1
	Dropdown Menu for time period has the correct 3 options	1
	Results - correct for each day Morning (40, 38, 41, 43, 36)	1
	Results - correct for each day Afternoon (19, 19, 18, 17, 12)	1
	Results - correct for each day All day (59, 57, 59, 60, 48)	1

All day	Mon
Sales	=IF(J4="Morning",SUM(C5:C9),IF(J4="Afternoon",SUM(C10:C14),SUM(C5:C14)))

Day	
Thu	Sales
Morning	=IF(J5="Morning",SUMIF(times,"<=12:00",INDEX(data,,MATCH(J4,days,0))),IF(J5="Afternoon",SUMIF(times,">12:00",INDEX(data,,MATCH(J4,days,0))),SUM(INDEX(data,,MATCH(J4,days,0)))))

=IF(J5="Morning",SUMIF(times,"<=12:00",INDEX(data,,MATCH(J4,days,0))),IF(J5="Afternoon",SUMIF(times,">12:00",INDEX(data,,MATCH(J4,days,0))),SUM(INDEX(data,,MATCH(J4,days,0)))))

	Formulae - Efficiency - e.g. All Nested IF()s have 2 levels only	1
	Formulae - Efficiency - e.g. SUMIF()/SUMIFS() and IF()/IFS() are used	1
	Available marks	**25**

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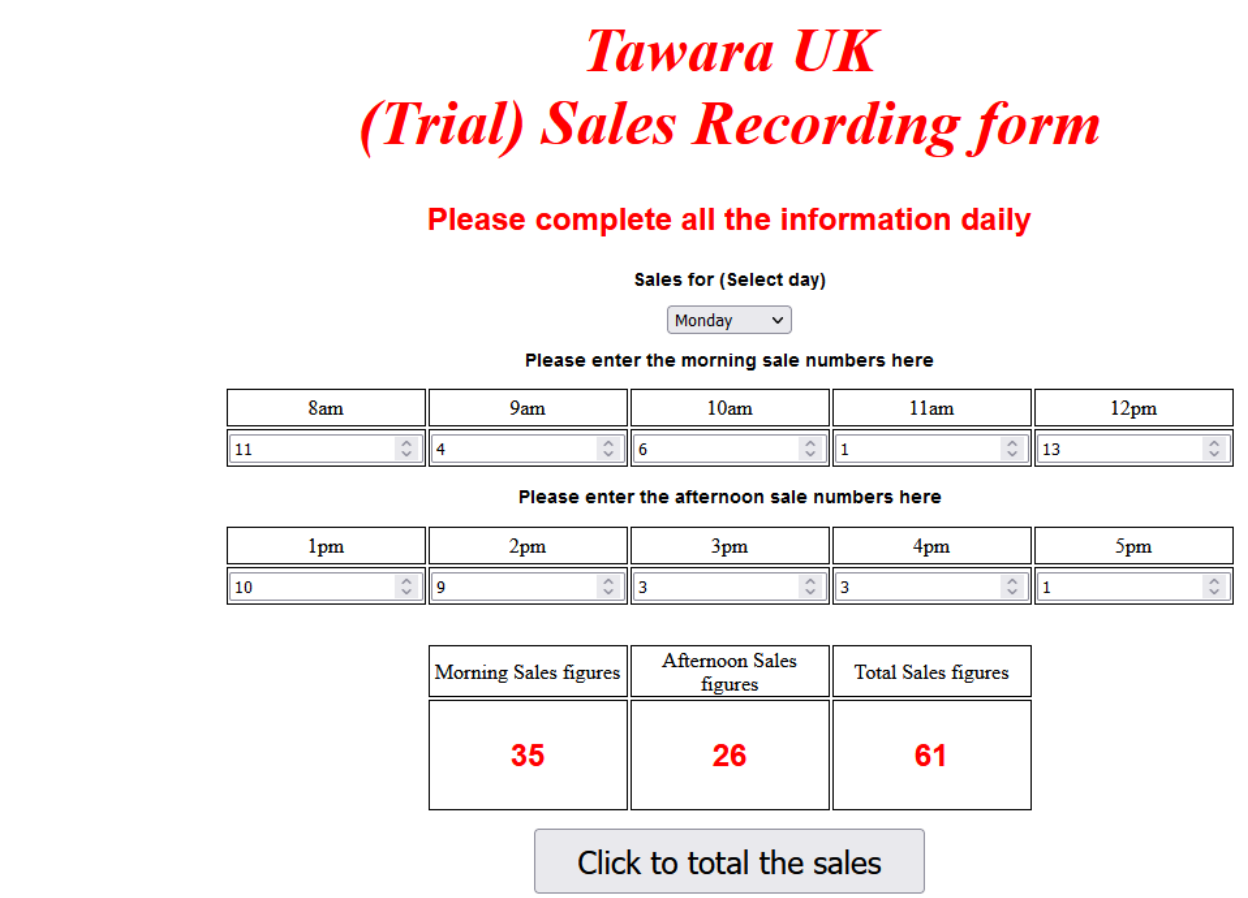
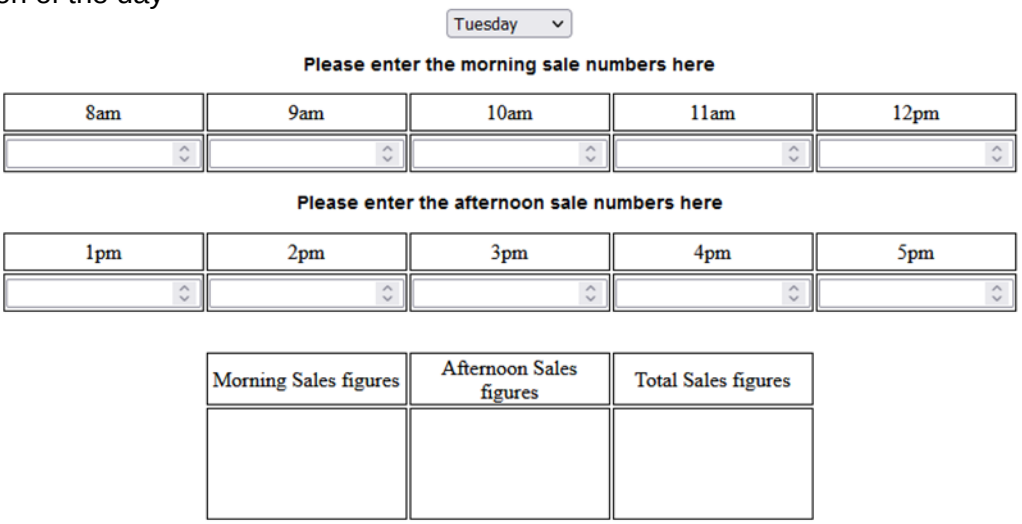
Task 4 – JavaScript



After new selection of the day



4	Button click populates all total cells	1
	Button click totals sales correctly	1
	Selection button blanks entries or sets cells to zero	1
	Selection button blanks page fully – both entries and totals blanked	1
	Page is fully refreshed - accepts new entries	1

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Task4 – JavaScript

```
<h2><button style="font-size:24px; height:50px; width:300px"; onClick="totals()">Click to total the sales
</button></h2>
```

<script>

onclick condition added to Button code/calls function() for totals – *(original line 99)*	1
<Script> tags correct, in <head> or <body>	1

function totals()
{
var morning = am8.value*1+am9.value*1+am10.value*1+am11.value*1+pm12.value*1;
var afternoon = pm1.value*1+pm2.value*1+pm3.value*1+pm4.value*1+pm5.value*1;
var total = morning+afternoon;

function() for totals created - *Any name but must match the onclick name*	1
Variables created for - total for am - total for pm - final total	1
am8:pm12 ids, pm1:pm5 ids are used	1
Valid method to convert to numerical values - e.g. .values *1, parseInt(), number()	1

document.getElementById("amtotal").innerHTML = morning;
document.getElementById("pmtotal").innerHTML = afternoon;
document.getElementById("total").innerHTML = total;
}

document.getElementById used to display the results	1
document.getElementById(**amtotal**) used	1
document.getElementById(**pmtotal**) used	1
document.getElementById(**total**) used	1
.innerhtml=morning/afternoon/total ***their*** variables used	1

```
<select name="day" id="day" onchange="clearform()">
```

onchange/onclick condition added to Day Selection code – *(original line 25)*	1
onchange calls a function() for clearing the form	1

function clearform()
{
am8.value="";am9.value="";am10.value="";am11.value="";pm12.value="";pm1.value="";
pm2.value="";pm3.value="",pm4.value="";pm5.value="";
window.location.reload()
}

function() for clearing form is created - the names must match	1
Valid method to create null values for all variables - e.g. value=""	1

Available marks	**20**

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