Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/04**

Paper 4 Advanced Practical **October/November 2024**

2 hours 30 minutes

You will need: Candidate source files (listed on page 2)

INSTRUCTIONS
● Carry out every instruction in each task.
● Save your work using the file names given in the task as and when instructed.
● You must **not** have access to either the internet or any email system during this examination.
● You must save your work in the correct file format as stated in the tasks. If work is saved in an incorrect file format, you will **not** receive marks for that task.

INFORMATION
● The total mark for this paper is 90.
● The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Any blank pages are indicated.

You have been supplied with the following source files:

Axis.png
Background.gif
Bay.jpg
Earth.png
MarketingPlans.xls
MemWordTest.html
MemWordTest.js
Moon.jpg
Moonlight.png

Create a folder called **Examination** .
You must save all your work in this folder.

Copy the source files into this folder.
Do **not** delete these files when submitting your work.
Do **not** tidy the folder by deleting files created at any stage of attempting the tasks.

You must use the most efficient methods to solve each task. All work produced must be of a professional standard and contain your candidate details.

Task 1

Open the **MarketingPlans.xls** spreadsheet to inspect the model.

The model contains a hidden formula for the Number of projected sales.

The project *Administration/Development* is expected to cost £150 000. Enter this value into the appropriate cell.

Enter £15 000 as the *Advertising* cost.

The *Manufacturing cost per Monitor* is expected to be £13. Enter this value into the appropriate cell.

Enter £14 as the *Monitor selling price*.

Display all costs and the *Monitor selling price* as currency in £ (GBP) to 2 decimal places.

Enter a formula in the appropriate cell to calculate the *Income* by multiplying the *Number of projected sales* by the *Monitor selling price*. Format this cell to match the costs.

The *Profit* is calculated by subtracting the total *Project costs* and the total *Manufacturing costs* from the *Income*.

Profit = Income – (total Project costs + (Manufacturing cost per Monitor x Number of projected sales))

Enter a formula in the appropriate cell to calculate the *Profit* and set the currency format to match the costs.

Use the model to determine the minimum *Monitor selling price* so that the project breaks even.
This is when the *Profit* is zero. Do **not** use trial and error methods.

Save your spreadsheet with the name **BreakEven_** followed by your centre number_candidate number. For example, BreakEven_ZZ999_9999

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The model needs to explore the sales, income and profit for different values.

Unprotect the model. The password is **CIE**

Limit the advertising costs to between £15 000 and £25 000.
Insert suitable input and error alert messages.

Enter £16 as the *Monitor selling price*.

The *Projections* table needs to be extended.

Amend the formulas in D14 and F14 to extend the *Projections* table as shown below:

	B	C	D	E	F
5		**Project costs**			
6		Administration/Development	£150,000.00		
7		Advertising	£15,000.00		
8					
9		**Manufacturing costs**			
10		Manufacturing cost per monitor	£ 13.00		
11					
12		**Projections**			
13		Monitor selling price	Number of projected sales	Income	Profit
14		£16.00	328221	£5,251,540.98	£819,663.93
15		£17.00	313221	£5,324,762.30	£1,087,885.25
16		£18.00	298221	£5,367,983.61	£1,326,106.56
17		£19.00	283221	£5,381,204.92	£1,534,327.87
18		£20.00	268221	£5,364,426.23	£1,712,549.18
19		£21.00	253221	£5,317,647.54	£1,860,770.49
20		£22.00	238221	£5,240,868.85	£1,978,991.80
21		£23.00	223221	£5,134,090.17	£2,067,213.12
22		£24.00	208221	£4,997,311.48	£2,125,434.43
23		£25.00	193221	£4,830,532.79	£2,153,655.74
24		£26.00	178221	£4,633,754.10	£2,151,877.05
25		£27.00	163221	£4,406,975.41	£2,120,098.36
26		£28.00	148221	£4,150,196.72	£2,058,319.67
27		£29.00	133221	£3,863,418.03	£1,966,540.98
28		£30.00	118221	£3,546,639.35	£1,844,762.30
29		£31.00	103221	£3,199,860.66	£1,692,983.61
30		£32.00	88221	£2,823,081.97	£1,511,204.92
31		£33.00	73221	£2,416,303.28	£1,299,426.23
32		£34.00	58221	£1,979,524.59	£1,057,647.54
33		£35.00	43221	£1,512,745.90	£785,868.85

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Use the data to create this chart in a separate chart sheet.
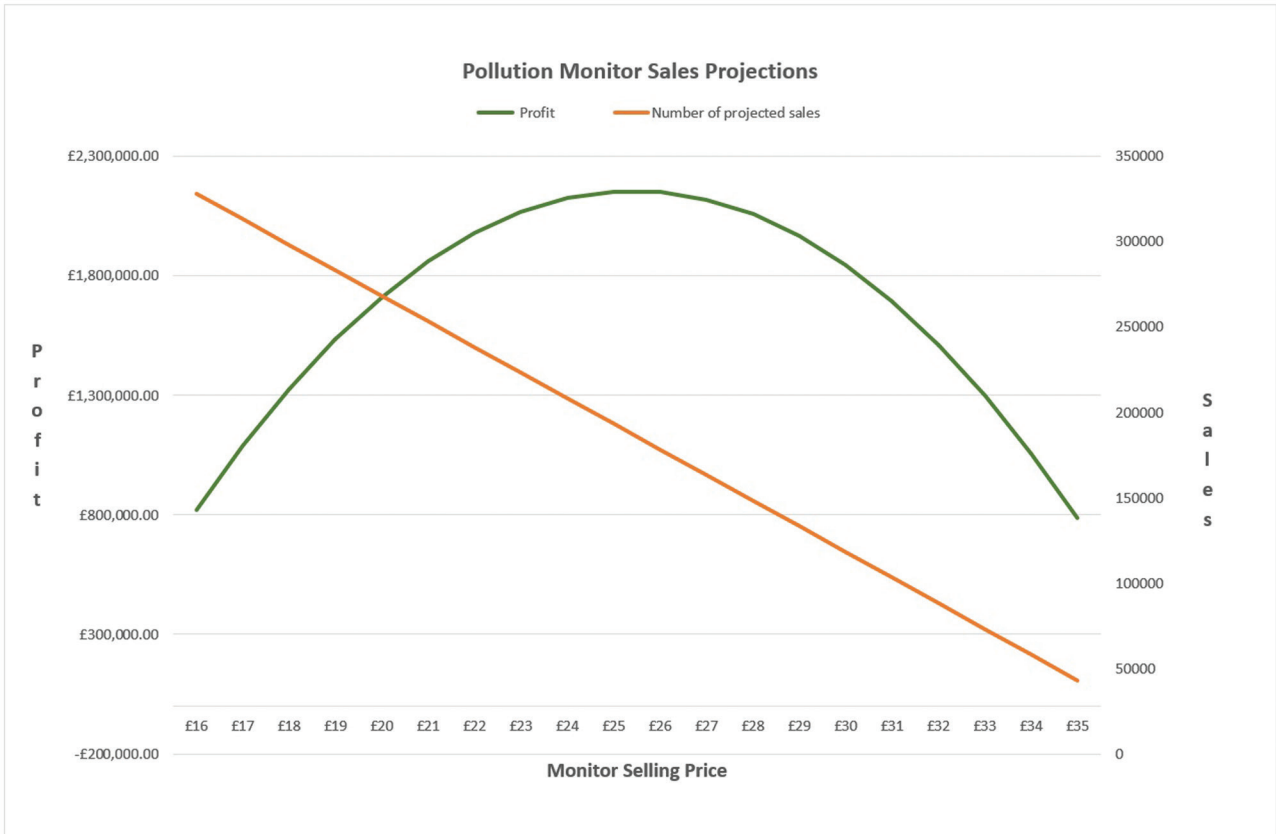
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In your *Sales_Model* worksheet, add a table to record the values as the *Advertising* costs are changed.

Project costs

Administration/Development	£150,000.00
Advertising	£15,000.00

Manufacturing costs

Manufacturing cost per monitor	£	13.00

Add data to the table by entering the *Advertising* values in the *Project costs* table.

Note the *Monitor selling price* that shows the highest *Profit* and manually enter the results in the table.

In the case shown, the *Maximum Profit* is for a *Monitor selling price* of £25

Projections

Monitor selling price	Number of projected sales	Income	Profit
£16.00	328221	£5,251,540.98	£819,663.93
£17.00	313221	£5,324,762.30	£1,087,885.25
£18.00	298221	£5,367,983.61	£1,326,106.56
£19.00	283221	£5,381,204.92	£1,534,327.87
£20.00	268221	£5,364,426.23	£1,712,549.18
£21.00	253221	£5,317,647.54	£1,860,770.49
£22.00	238221	£5,240,868.85	£1,978,991.80
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£32.00	88221	£2,823,081.97	£1,511,204.92
£33.00	73221	£2,416,303.28	£1,299,426.23
£34.00	58221	£1,979,524.59	£1,057,647.54
£35.00	43221	£1,512,745.90	£785,868.85

Advertising	Maximum Profit	Monitor selling price
£15,000.00	£2,153,655.74	£25.00
£16,000.00		
£17,000.00		
£18,000.00		

Determine the highest *Maximum Profit* and the associated *Monitor selling price* and highlight the row.

Save the spreadsheet as **MarketingScenarios_** followed by your centre number_candidate number. For example MarketingScenarios_ZZ999_9999

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Task 2

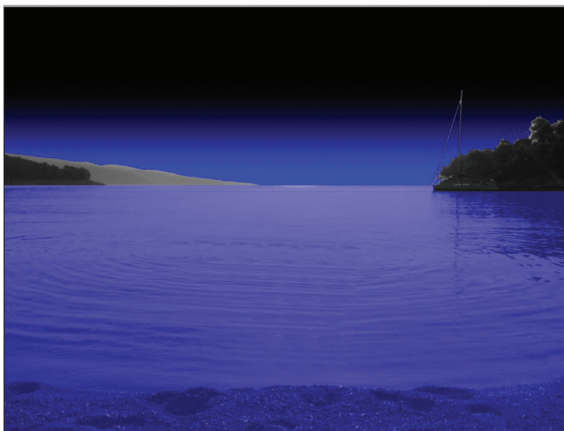Open **Bay.jpg** in an image editing application.

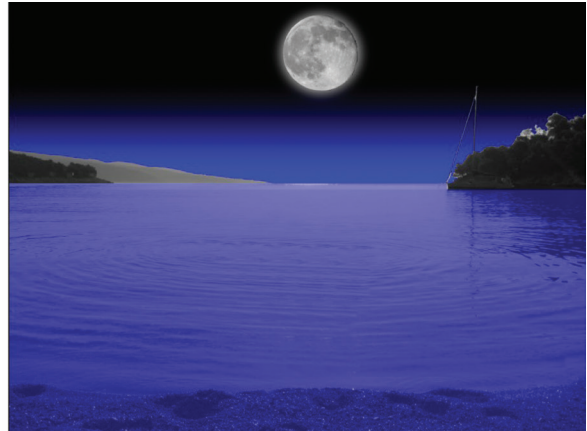Step 1 – Remove the figure and repair the sea.

Step 2 – Recolour the image as greyscale and remove the sky.

Step 3 – Replace the sky with a black-to-blue gradient.

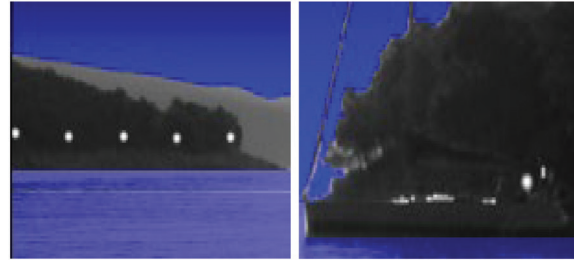Step 4 – Colour the sea and sand using a blue layer with 40% opacity.

Step 5 – Use **Moon.jpg** to add the Moon to your image. Recolour and position as shown.

Step 6 – Add a halo effect around the Moon as shown.

Step 7 – Add some stars to the sky, lights on the headland and lights on the boat.

Step 8 – Use **Moonlight.png** to add the reflection of the Moon in the sea.
Your final image should look like this.

Save your image in **.png** format named **NightScene_** followed by your centre number_candidate number. For example, NightScene_ZZ999_9999

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Task 3

You are required to animate the path (orbit) of the planet Earth around the Sun.

Set the stage to match the size of the **Background.gif** image.
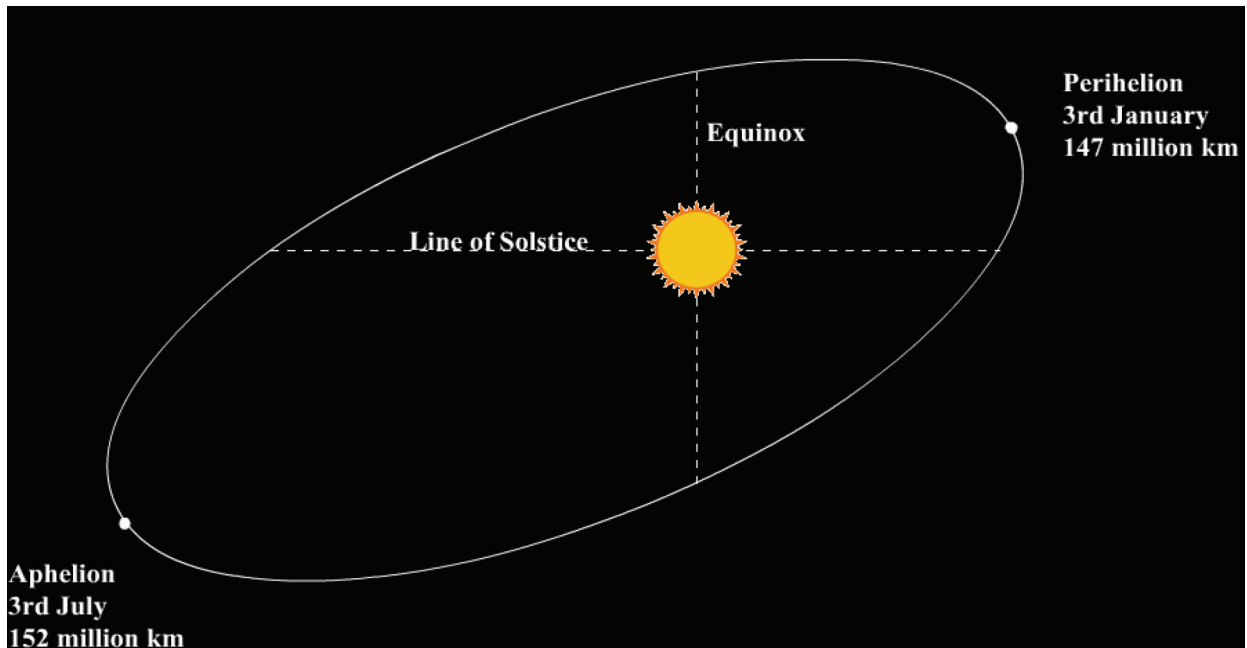
Background.gif

Use the **Earth.png** and **Axis.png** images in your animation.

Earth.png   Axis.png
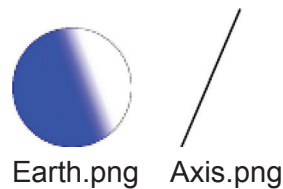
The Earth and axis images must follow the path shown in Background.gif
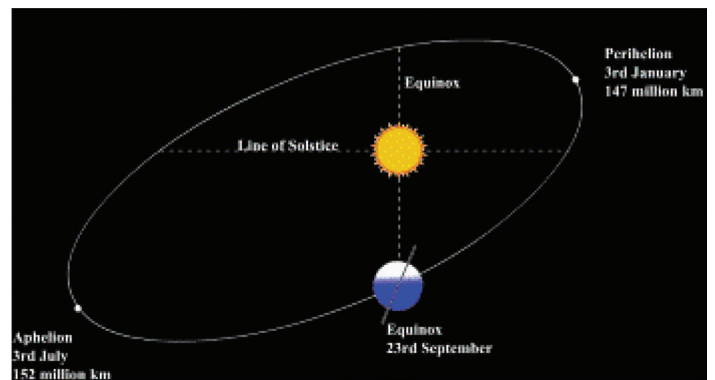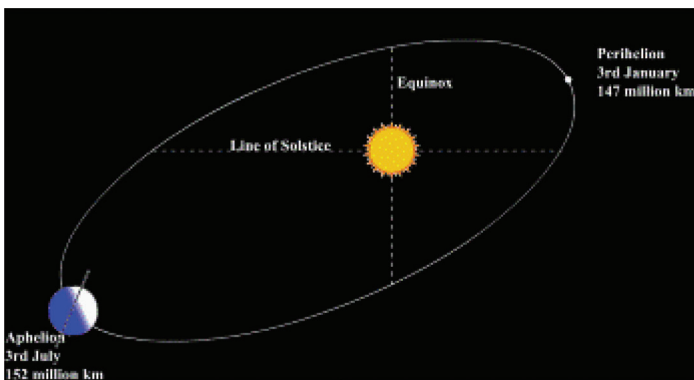
The animation must start at the Aphelion point shown and travel at an even rate around the Sun.

The light side of the Earth must always face the Sun.
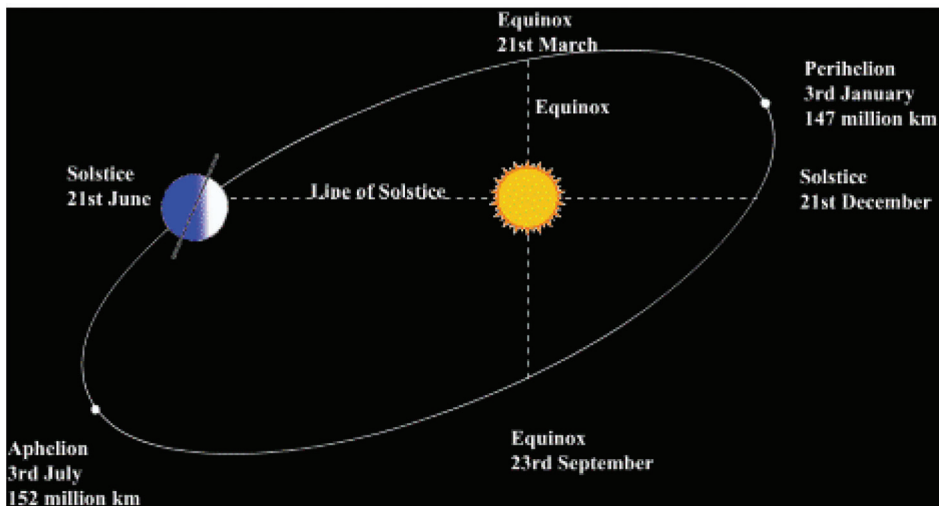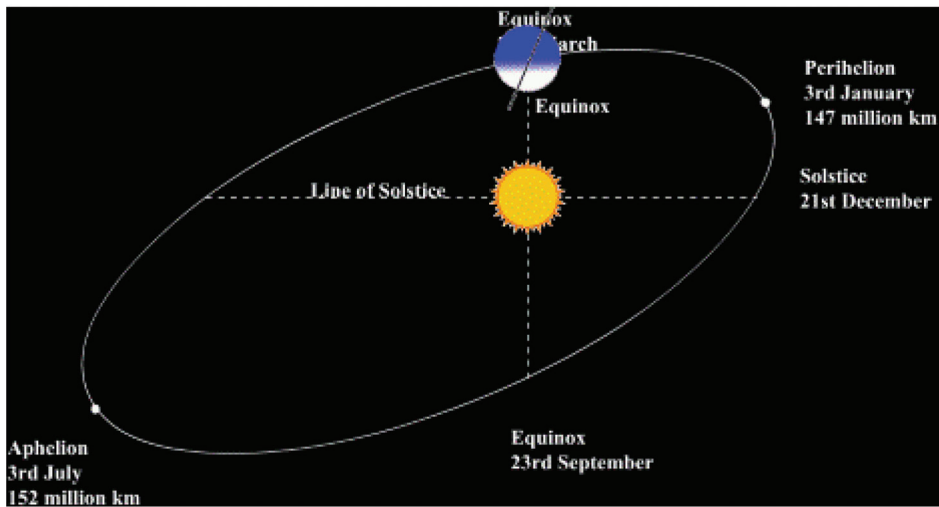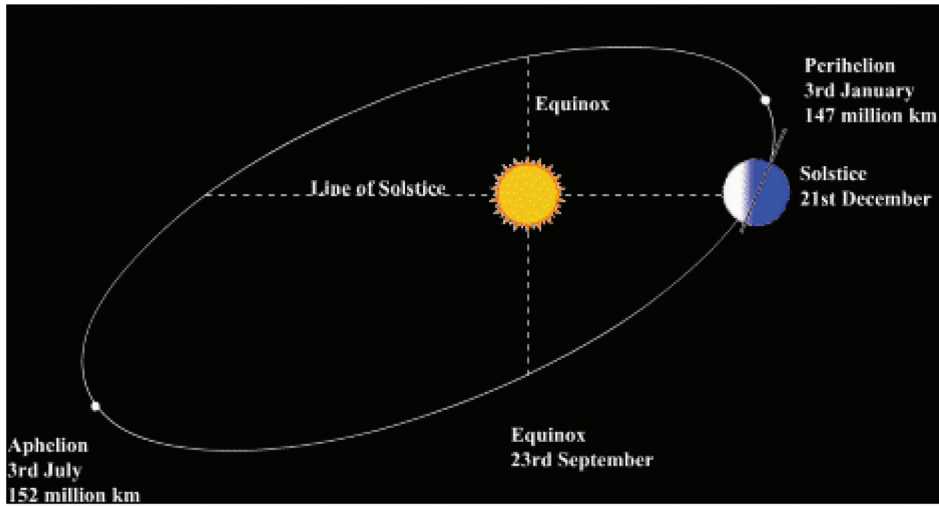
The text shown must appear as the Earth passes each point.
The text must be formatted to match the text in the image.
The animation must take 8 seconds for the complete orbit.
The animation must then restart and loop continuously.

Save your animation as an animated gif named **Orbit_** followed by your centre number_candidate number. For example, Orbit_ZZ999_9999

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Task 4

Open **MemWordTest.html** in your browser.

The page will test whether a user can access a site by entering a letter from their memorable word. In this case the memorable word is Cambridge. You are required to edit and improve the webpage.

Test the page by entering normal and abnormal data following the instructions shown.

Open **MemWordTest.html** in a text editor and examine the HTML.

The page uses JavaScript to make it work.

Open **MemWordTest.js** in your text editor.

Note the comments and examine the code used to show and hide the buttons.

Add code as described in the comments to:

- hide the *Submit* button and display the *Try again* button if the letter entered is incorrect
- display the text shown when the letter entered is correct.

Save the JavaScript file with the same name.

Add code to allow only 3 incorrect entries. Display the message **Security check failed** each time.

After the third incorrect entry, display the message **Refresh the page to try again** on a new line.

Save the JavaScript file with the same name.

Save the webpage as **MemWordTest_** followed by your centre number_candidate number. For example, MemWordTest_ZZ999_9999

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