2014-DSE
ICT
PAPER 2C

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HONG KONG EXAMINATIONS AND ASSESSMENT AUTHORITY
HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION 2014

Candidate Number

INFORMATION AND COMMUNICATION TECHNOLOGY
PAPER 2C
Multimedia Production and Web Site Development
Question-Answer Book

11.15 am – 12.45 pm (1 hour 30 minutes)
This paper must be answered in English

INSTRUCTIONS

(1) After the announcement of the start of the examination, you should first write your Candidate Number in the space provided on Page 1 and stick barcode labels in the spaces provided on Pages 1, 3, 5 and 7.

(2) **ANSWER ALL QUESTIONS.** Write your answers in the spaces provided in this Question-Answer book. Do not write in the margins. Answers written in the margins will not be marked.

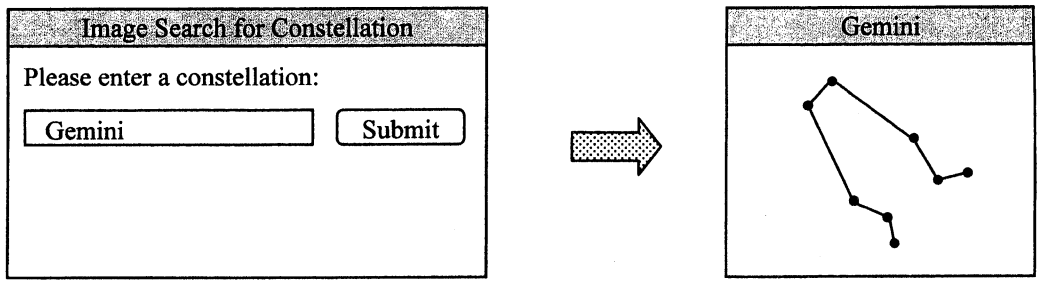
(3) Supplementary answer sheets will be supplied on request. Write your candidate number, mark the question number box and stick a barcode label on each sheet, and fasten them with string **INSIDE** this book.

(4) No extra time will be given to candidates for sticking on the barcode labels or filling in the question number boxes after the 'Time is up' announcement.

* A 2 0 0 E 0 2 C *

Answer all questions.

1. Mary and Victor are working on a project to develop information kiosks in a museum. They design a web page to show images of constellations. When a constellation name is entered in this web page, the image of the constellation will be shown in a popup window. An example is shown below.



(a) (i) Mary suggests creating the images of constellations in vector graphics. Give a reason to support her suggestion.

_____

_____

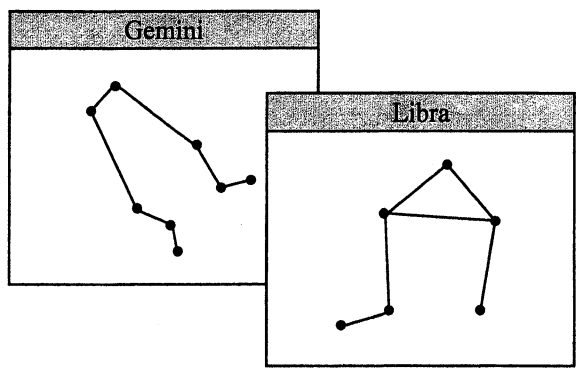
(ii) Victor suggests creating the images of constellations in bitmap graphics. Give a reason to support his suggestion.

_____

_____

(2 marks)

(b) Mary searches for two constellations and two popup windows are generated, as shown below:



Give **two** control attributes of the popup windows which can prevent overlapping.

_____

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(2 marks)

Answers written in the margins will not be marked.

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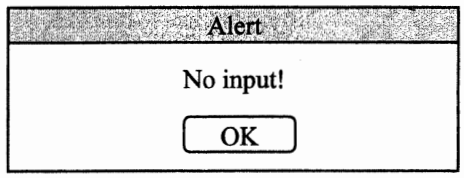
Please stick the barcode label here.

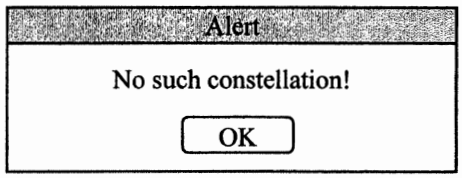
(c) Mary tests the web page.

(i) She presses the 'Submit' button without any constellation name entered. The following popup window appears instantly.



Describe how data validation is implemented in this interactive web page.

(ii) She presses the 'Submit' button with the name of a non-existent constellation. The following popup window appears after a few seconds.



Describe how data validation is implemented in this interactive web page.

(4 marks)

Answers written in the margins will not be marked.

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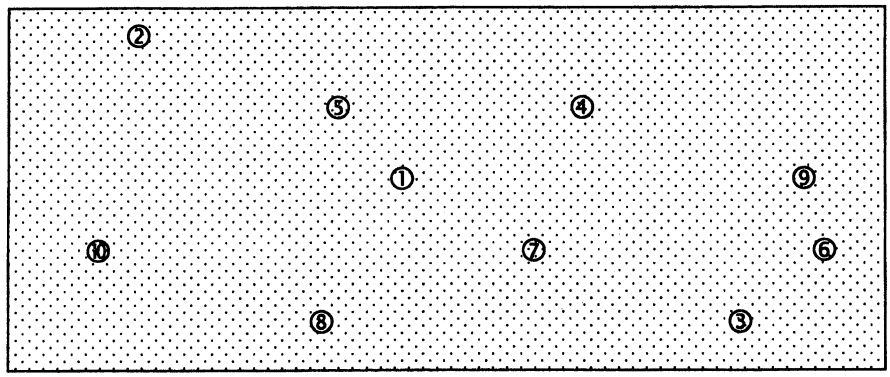
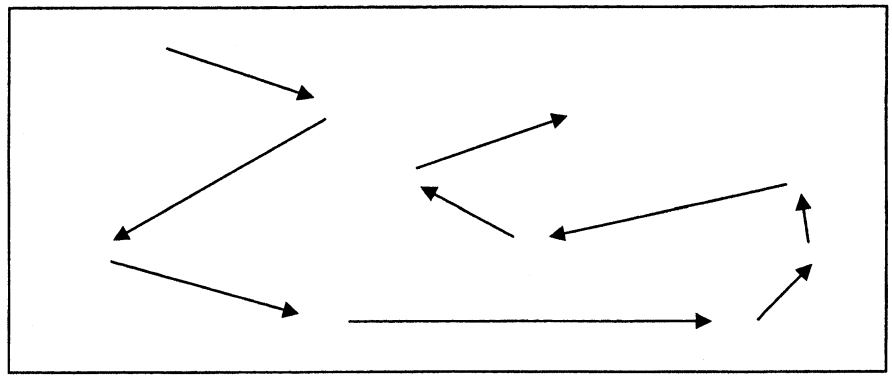
The museum has 10 exhibition areas, numbered 1 to 10 in the following floor plan of the museum.



Mary designs a walking path, as shown in the following transparent image, for visitors to follow.



(d) Mary creates four other transparent images of different walking paths and incorporates them into the floor plan so that visitors can select one walking path for their visit.

(i) Suggest a file format for the transparent images. _____

(ii) Describe how the floor plan and these transparent images can enable visitors to select a walking path through web pages.

_____

_____

_____

(3 marks)

(e) Mary wants to add an audio file to the web pages. Give a reason to support the use of the following formats:

(i) MP3 _____

_____

(ii) MIDI _____

_____

(2 marks)

Answers written in the margins will not be marked.

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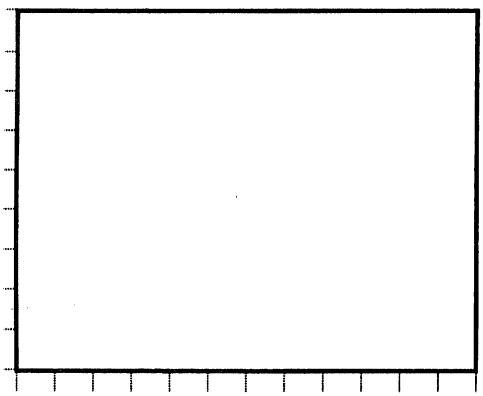
Please stick the barcode label here.

(f) Mary wants to show `A.htm`, `B.htm` and `C.htm` on a web page with the HTML codes shown below:

```
<HTML>
<FRAMESET COLS ="*, *, 200">
<FRAME SRC="A.htm" >
<FRAME SRC="B.htm">
<FRAME SRC="C.htm">
</FRAMESET>
</HTML>
```



Write `A`, `B` and `C` to denote `A.htm`, `B.htm` and `C.htm` respectively and draw lines to show their sizes in the window provided. Assume that the size of the window is 1200×900.

(3 marks)

Answers written in the margins will not be marked.

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2. Ms Wong is a project coordinator in Love & Joy School. She will coordinate the development of the new school web site.

(a) Ms Wong thinks that a site map is very important. Give **two** benefits of including the site map.

_____

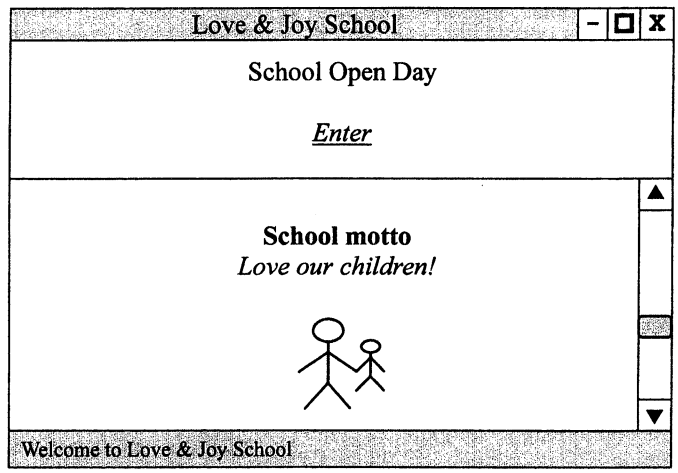
_____

_____

_____

(2 marks)

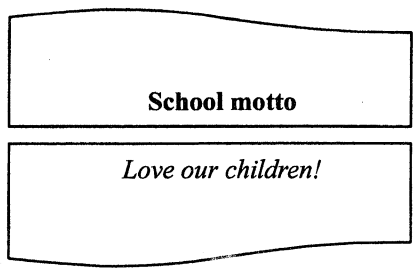
A web page is designed, as shown below:



(b) (i) The web page in the lower frame is very long. Suggest a web design feature which can help users navigate back to the top of the page more easily.

_____

(ii) Ms Wong directly prints this web page and there are many broken pages. An example of the broken pages is shown below:



Describe a solution regarding web page design.

_____

_____

_____

(3 marks)

Answers written in the margins will not be marked.

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Please stick the barcode label here.

(c) Ms Wong decides to apply a 'scrolling message' effect to the school motto '*Love our children!*'.

(i) Give a reason to support her decision.

(ii) The Principal suggests applying the same effect to the hyperlink '*Enter*' too. Do you agree? Explain briefly.

(2 marks)

(d) A style is encoded in a web page, as shown below:

```
<p style="text-align:center; font-size:30pt">School Open Day</p>
```

(i) Ms Wong suggests defining the style as an element under `<head>` tag. Give a reason to support her suggestion.

(ii) Ms Wong decides to define and store the style in a separate style sheet. Give a reason to support her decision.

(4 marks)

(e) The school provides live videos for parents to view the graduation ceremony in the school hall through the new school web site. Suggest **three** solutions in which Ms Wong can reduce the network traffic loading.

Solution 1: _____

Solution 2: _____

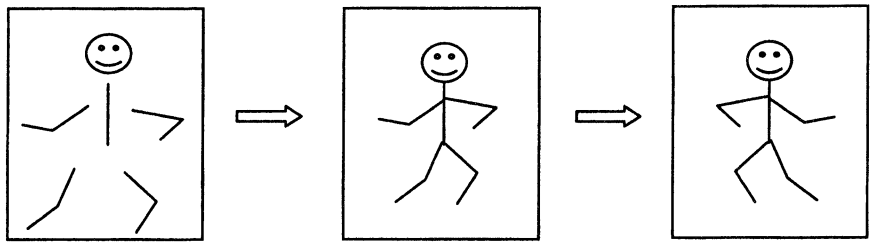
Solution 3: _____

(3 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

3. Mr Li designs a web site for children. He uses a software package to create the first drawing.



First drawing Second drawing Third drawing

(a) (i) Mr Li moves the components in the first drawing and forms the object in the second drawing. Then he applies a function in the software package so that he can move the object as a whole. What function does he apply?

_____

(ii) Suggest a function in the software package which can produce the third drawing from the second one efficiently.

_____

(2 marks)

(b) Mr Li wants to create an animation so that the second drawing evolves smoothly into the third drawing.

(i) What kind of technique should he use? _____

(ii) Give **two** attributes that can be adjusted when using the technique in (b)(i).

_____

_____

_____

(iii) Mr Li wants to upload the animation to his web site. He decides to save the animation in MP4 instead of FLV. Other than the popularity, give **two** reasons to support his decision.

_____

_____

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_____

(5 marks)

(c) Mr Li converts the animation into a video file with the following attributes.

Frame rate:	24 frames / second
Resolution:	320 × 240 pixels
Colour depth:	24 bits
Bit rate:	500 kbps
Length of the video:	60 seconds

Answers written in the margins will not be marked.

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(i) Mr Li expects that the file size should be

$$24 \times 60 \times 320 \times 240 \times 24 / 8 = 316 \text{ MB}$$

However the actual file size is much smaller. Estimate the actual file size and briefly explain why it is much smaller than Mr Li expects.

(ii) Mr Li adds a 60-second sound track to the video file. The file size increases by 10 MB. The details of the sound track are given below.

Sample size: 16-bit
Channel: Stereo

Estimate the sampling rate of the sound track.

(4 marks)

(d) Mr Li has some photos for the web site. He uses photo editing software to edit the photos.

(i) He applies filters to some photos before uploading. Give **two** examples of the filters and describe the effects briefly.

(ii) The resolution of a photo is 4,096×2,160 and its colour depth is 24 bits. Mr Li decides to lower its resolution. He wants to keep the original aspect ratio and the color depth. The photo should be as clear as possible but the uncompressed file size must be below 1.6 MB. Suggest the new resolution of the photo.

(4 marks)

Answers written in the margins will not be marked.

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4. Tom and Mary are going to develop an online platform for the students of an education institute to do mathematics quizzes online and offline.

(a) Tom suggests providing the quizzes in PDF, instead of JPG, for students to download. Give **two** reasons to support his suggestion.

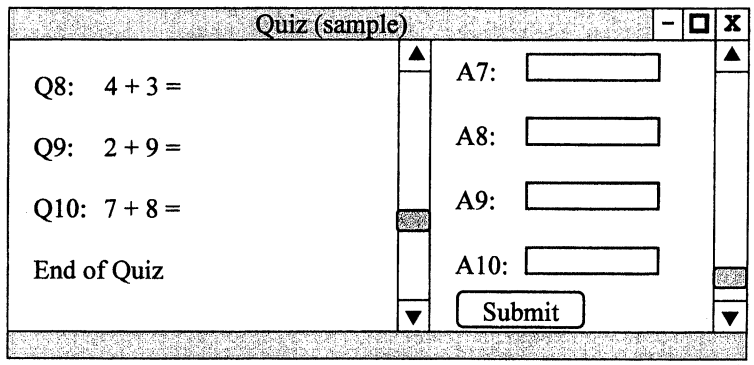
_____

_____

_____

(2 marks)

Tom designs a prototype for the quizzes, as shown below:



(b) (i) From the user's point of view, give a potential problem with this prototype.

_____

_____

(ii) Suggest **two** different designs which can solve the problem in (b)(i). Draft the layouts of the designs and describe them briefly.

Design 1

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Answers written in the margins will not be marked.

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Design 2

(7 marks)

The online platform should generate mathematics questions about the addition of two integers. `MyRand()` is a number generator that returns a random integer from 1 to 10. Mary writes a client-side script with `MyRand()` and the following variables.

Variable	Description
`P[i]`	Store the first number of the `i`-th question
`Q[i]`	Store the second number of the `i`-th question
`temp`	Temporary storage

(c) Mary designs the following algorithm of the client-side script to generate three questions.

```
temp ← MyRand()
P[1] ← temp
Q[1] ← temp * 2
temp ← temp + 1
P[2] ← temp
Q[2] ← temp * 2
temp ← temp + 1
P[3] ← temp
Q[3] ← temp * 2
temp ← temp + 1
```

(i) The client-side script is executed and `MyRand()` returns `1`. The first question is given below. What are the other two questions?

Question 1: 1 + 2 =

Question 2: _____ + _____ =

Question 3: _____ + _____ =

Answers written in the margins will not be marked.

(ii) What is the drawback of Mary's design?

_____

_____

(iii) Tom wants more mathematics questions to be generated. He improves the script with the use of the variable `N` which stores the total number of questions.

Describe how the values of `P` and `Q` are produced when generating the `N` questions.

(6 marks)

END OF PAPER

Answers written in the margins will not be marked.

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