

HONG KONG EXAMINATIONS AND ASSESSMENT AUTHORITY  
HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION 2023

**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 **THREE** out of four 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.

Please stick the barcode label here.

Candidate Number



**Answer THREE questions only.**

1. Ava considers creating some images in bitmap or vector graphics.

- (a) (i) Give an advantage and a disadvantage of using bitmap.

Advantage: \_\_\_\_\_

Disadvantage: \_\_\_\_\_

(2 marks)

- (ii) Give a scenario in which Ava would prefer vector graphics to create the images.

\_\_\_\_\_

(1 mark)

Ava travels to the countryside and uses a drone to take photos and videos. The photos are saved in both JPG and RAW formats and shared with Ava's friends through a social media platform.

- (b) (i) Give a reason to support the use of each format for sharing the photos.

JPG: \_\_\_\_\_

\_\_\_\_\_

RAW: \_\_\_\_\_

(2 marks)

- (ii) Ava finds that the image quality of the JPG file received by her friends through the platform is lower than that of the original JPG file. Suggest another better sharing method for her to send the JPG file.

\_\_\_\_\_

(1 mark)

Please stick the barcode label here.

(c) Ava shares the photos with her friends where lossy compression is used.

- (i) Why is the compression ratio for lossy compression usually higher than that for lossless compression?

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(1 mark)

- (ii) The file size of a photo is changed from 8 MB to 512 KB after compression. Estimate the compression ratio. Show your calculation.

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(2 marks)

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- (d) Ava exports a video from the drone with the following setting:

Resolution	1080 × 1920
Colour depth	24 bits
Frame rate	30 fps
Bitrate	8 Mbps

- (i) The length of the video is 20 minutes. Estimate the file size in GB of the uncompressed video. Show your calculation.

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(2 marks)

- (ii) The broadband setting at Ava's home is:

Upload speed	600 Mbps
Download speed	1000 Mbps

Estimate the time required in seconds for posting a 5 GB video onto the Internet. Show your calculation.

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(2 marks)

- (iii) Ava plays the video on a TV with a resolution of 3840 × 2160. What problem will she probably encounter? How can she solve the problem?

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(2 marks)

Please stick the barcode label here.

2. Peter sings a song while playing guitar. He wants to make a recording.

- (a) Of the following formats, list those that are used for storing audio data **only**.

AAC, AVI, FLV, MOV, MP3, MP4, WAV

(2 marks)

- (b) He records the song with the following setting:

Sampling rate	44.1 kHz
Sample size	16 bits
Number of channels	4
Bitrate	192 kbps

The length of the recording is 3 minutes. Estimate the file size in MB of the uncompressed audio. Show your calculation.

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(2 marks)

- (c) He plans to use an image file instead of text to display the lyrics of the song on a web page. Give an advantage and a disadvantage of this plan.

Advantage: \_\_\_\_\_

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Disadvantage: \_\_\_\_\_

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(2 marks)

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- (d) He uploads the song onto his web site. Other than Play, Stop, Pause and Volume, suggest **two** additional controls when a user is playing the song.

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(2 marks)

- (e) He develops a web site for song sharing:

Cover	Song	Singer	Duration	Like
	Good Mood	Peter	2:33	
	Dusty Road	Mary	2:38	
	Deep Journey	Tiger	2:50	
<a href="#">Next page &gt;</a>		1 2 3 4 <b>5</b> 6 7 8 9 10 11 ... >		

- (i) Suggest **two** changes to the web page above to improve the layout design.

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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.

- (ii) There are many songs on the web site and it is difficult for users to find a song. Suggest **three** changes to the web page design to enhance the efficiency of searching for songs.

(1) \_\_\_\_\_  
\_\_\_\_\_

(2) \_\_\_\_\_  
\_\_\_\_\_

(3) \_\_\_\_\_  
\_\_\_\_\_

(3 marks)

- (iii) Peter plans to develop a mobile version of the web site. Give **two** changes to the web page design that should be considered.

\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

Answers written in the margins will not be marked.



Answers written in the margins will not be marked.

3. Mary creates a web site for selling tickets to concerts and shows.
- (a) Mary cannot register *onlineticketing.edu.hk* for her business. Give **two** possible reasons for this.

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(2 marks)

- (b) Mary finally registers and uses *onlineticketing.com*.
- (i) Does Mary need to register *concert.onlineticketing.com* to use it for selling concert tickets? Explain briefly.

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(1 mark)

- (ii) Can Mary use *onlineticketing.com.hk* for selling tickets in Hong Kong? Explain briefly.

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(1 mark)

- (c) Mary considers using the protocol ‘https’ on the web site.
- (i) How can ‘https’ enhance the security of data transfer?

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(1 mark)

- (ii) Suggest an application on the web site that ‘https’ should be used for.

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(1 mark)

Answers written in the margins will not be marked.

(d) Mary plans to design a web page for users to search for events, based on the following data:

Event ID	Event name	Year	Month	Day	Time	Venue	District	Performers
1	The Nutcracker	2022	12	23	10:00	City Hall	Central	Dance club
2	ST Musical	2022	12	24	19:00	Kwai Tsing Theatre	Kwai Tsing	ST group
3	Tiger King	2022	12	24	19:00	Ko Shan Theatre	To Kwa Wan	Tiger
:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:

(i) Draft a design of the web page with the following four input controls to reduce input errors. The design should be tidy, functional, and user friendly. Annotate your design, where appropriate.

- Text field
- Radio button
- Check box
- Dropdown menu

Online Ticketing

(4 marks)

(ii) Suggest a useful feature in the above design that can use location services on mobile devices.

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(1 mark)

Answers written in the margins will not be marked.



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- (e) Give **two** benefits of using cookies for online ticketing on Mary's web site.

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(2 marks)

- (f) There is a video trailer for each event, shown on the web site. What accessibility options in the video trailer can be offered for the following people? Explain briefly.

Visual-impaired people:

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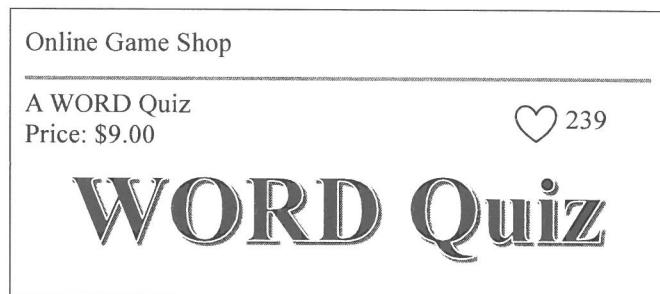
Hearing-impaired people:

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(2 marks)

4. John designs a web site with the following screenshot:



When clicking the heart shape icon , it turns to a filled icon . The number next to the icon is the total number of clicks on the icon by all visitors.

- (a) John uses client-side scripts and server-side scripts for generating the feature described above. Briefly describe the scripts used.

Client-side scripts: \_\_\_\_\_

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Server-side scripts: \_\_\_\_\_

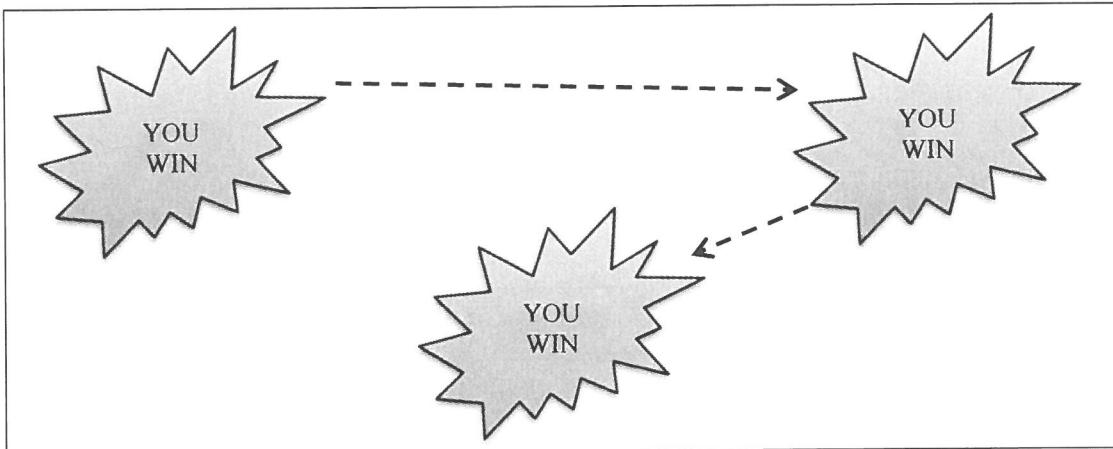
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(4 marks)

Below is an animation to show ‘YOU WIN’. The object ‘YOU WIN’ starts at the top left corner of the screen, then moves to the top right corner, and finally moves to the middle of the bottom. This animation lasts for 2 seconds without any change in the size or shape of ‘YOU WIN’.



John uses tweening to create this animation.

- (b) (i) State the type of tweening used and describe how this animation is created.

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(3 marks)

- (ii) The frame rate of this animation is 30 fps. How many frames are created for this animation?

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(1 mark)

'WORD Quiz' is a word guessing game. John writes a client-side script `CHECKANS` to check a player's input against the answer and return the checked result, with the following variables and subprograms:

Variable / Subprogram	Description
ANS	Store the answer (a word of 5 capital letters)
INP	Store a player's input (a word of 5 capital letters)
GETLET(ST, N)	Return the N-th letter of a string ST Example: GETLET("HERO", 2) returns "E"
CONCAT(ST1, ST2)	Combine two strings ST1 and ST2 and return the combined string Example: CONCAT("HER", "O") returns "HERO"

Below is a sample output of the game with the answer 'APPLE'. After a player inputs a word, the correct letters will be displayed and '?' will be displayed for incorrect letters. The game will end when the player correctly guesses the answer.

Guess a word: ALPES  
A?P??

Guess a word: APPLY  
APPL?

Guess a word: APPLE  
APPLE

(c) Complete the pseudocode for `CHECKANS` below.

```

DO
    Initialise ST as a null string
    INP ← input a word of 5 capital letters
    FOR K FROM [ ] DO
        IF GETLET(INP,K) = GETLET([ ],[ ]) THEN
            ST ← CONCAT([ ],[ ])
        ELSE
            ST ← CONCAT(ST, "?")
        OUTPUT ST
    WHILE ST <> [ ]

```

(7 marks)

**END OF PAPER**

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