



UTHM

Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024**

COURSE NAME : MULTIMEDIA SECURITY TECHNOLOGY

COURSE CODE : BIM 33403

PROGRAMME CODE : BIM

EXAMINATION DATE : JULY 2024

DURATION : 3 HOURS

INSTRUCTION :

1. ANSWER ALL QUESTIONS
2. THIS FINAL EXAMINATION IS CONDUCTED VIA
 - Open book
 - Closed book
3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 Questions **Q1(a)** – **Q1(b)** are based on the following scenario:

UTHM plans to develop an open micro credential learning platform called AuthorOML, that will be based on the open distance learning concept. AuthorOML will enable the educator to upload their course(s) including the related requirement and assessment to complete the course(s). The subscriber can search and subscribe available course(s) and pay the fees. The subscriber will be awarded a digital badge, upon successfully completing the course. The educator will be paid based on the number of subscribers. The subscriber will be provided with services such as view account; update account details; subscribe course; monitor the learning and assessment progress; download digital badge, make payment thru third party gateway; and release the payment once the course is completed. The authentication and authorization strategies for enabling these functionalities for the platform must be balanced between usability and security. AuthorOML should support access from multiple devices such as smart phones, tablets, and desktop. The educator/subscriber can only register one account.

- (a) Discuss AuthorOML security requirements and concerns in term of information security principles and potential threats/attacks. (12 marks)
- (b) Discuss **TWO (2)** strategies for authentication and corresponding authorization for different services that can be applied. (8 marks)
- (c) Propose **TWO (2)** suitable guidelines to defeat potential Brute Force attacks, based on the answer in **Q1(b)**. (6 marks)

Q2 Questions **Q2(a)** – **Q2(c)** are based on the following scenario:

With the rapid growth of open distance learning platforms, services, and education content streaming, content protection for video has become increasingly important. In the light of this digital progression, U1CTV Network is currently developing an education video-on-demand platform that enable customers to either stream the video real-time or download it to a device and watch it later within a given period. The platform must support both during-delivery and post-delivery protection of the video from unauthorized access and distribution. Also, the platform must adapt the video content according to the client's device. Each client's account permits a content to be downloaded to a maximum of 2 devices.

- (a) Illustrate the related Digital Right Management (DRM) activities to suit the platform. (8 marks)

- (b) Propose a suitable recovery plan for the platform. (8 marks)
- (c) Discuss **TWO (2)** relevant strategies that UiCTV Network should apply for end-to-end content delivery protection, including redistribution. (6 marks)

Q3 Questions **Q3(a) – Q3(d)** are based on the code snippet in **Figure Q3.1**:

```
printf("Enter a word: ");
fgets(word, 10, stdin);
printf("Enter x: ");
scanf("%d", &x);
for (i = 0; word[i] != '\0'; ++i)
{if (word [i] >= 'a' && word [i] <= 'z')
    {word [i] = word [i] + x;
    if (word [i] > 'z')
        {word [i] = word [i] - 'z' + 'a' - 1;}}}}
printf("Encrypted word: %s", word);
```

Figure Q3.1

- (a) State whether the algorithm is suitable for encrypting numbers or not. (2 marks)
- (b) State the data type of the x variable. (2 marks)
- (c) State the data type of the output. (2 marks)
- (d) State the word being entered if the output is `move` and the x value is 3. Illustrate the input. (3 marks)
- (e) Given the word to encrypt is `yes` and the x value is 4, illustrate the output. (3 marks)

Q4 Questions **Q4(a)** – **Q4(c)** are based on the following message:

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- (a) Illustrate the cipher text after the Rail-fence transposition (with 3 rails) technique is applied. (4 marks)

- (b) Discuss how the Rail-fence transposition technique can be deployed with dynamic value of rail. (3 marks)

- (c) Discuss how the message can be hidden inside an image. (3 marks)

Q5 Questions **Q5(a)** – **Q5(b)** are based on the following scenario.

The goal of ISO 27001 (Information Security Management System) is to provide a framework of standards for how an organization should manage their information and data.

- (a) Justify **TWO (2)** reasons why ISO 27001 should be applied to UTHM's SMAP system. (4 marks)

- (b) Discuss **TWO (2)** authentication guideline for the UTHM's SMAP system administrator to enable a student accessing the system using multiple devices. (6 marks)

- END OF QUESTIONS -

