UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018

COURSE NAME	:	SPECIAL TOPICS IN INFORMATION SECURITY
COURSE CODE	:	BIS 33403
PROGRAMME CODE	:	BIS
EXAMINATION DATE	:	JUNE / JULY 2018
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

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

Q1   Answer **Q1(a) – Q1(f)** based on **Figure Q1**.

On March 17, the London Observer and The New York Times reported that UK-based data firm Cambridge Analytica acquired millions of Facebook users' personal information to build software that could target potential swing voters in political campaigns, including US President Donald Trump's 2016 election bid.

The newspapers broke the story with the help of Cambridge Analytica's cofounder and now whistle-blower Christopher Wylie.

"We exploited Facebook to harvest millions of people's profiles and built models to exploit what we knew about them and target their inner demons. That was the basis the entire company was built on," he told the Observer.

The data his firm used was reportedly gathered in early 2014 through an app called "thisisyourdigitallife", which was built by a Russian-American researcher at Cambridge University called Aleksandr Kogan.

In the days following the original reporting, the Twitter hashtag #DeleteFacebook began trending. Congress asked Facebook CEO Mark Zuckerberg to testify on what had happened. The social media giant's share value took a dramatic dive, down $60bn at one point down.

Facebook rejected the claim that a data breach had happened. "People knowingly provided their information, no systems were infiltrated, and no passwords or sensitive pieces of information were stolen or hacked," it said in a statement.

When the data harvesting was taking place, Facebook's policy allowed for the collection of friends' data by app creators and academics, though selling this data to third parties or using it for advertising was not prohibited.

In 2015, Facebook found out Kogan's company allegedly violated its policies when it passed the material on to Cambridge Analytica. In the March 16 statement, the social media company said it had been assured then that Cambridge Analytica, Kogan, and Wylie had deleted the data.

Still, the Observer reported: "At the time [Facebook] failed to alert users and took only limited steps to recover and secure the private information of more than 50 million individuals".

Kogan's app was removed from Facebook in 2015, but the social media behemoth didn't suspend Cambridge Analytica and SCL Group - the firm that serviced contracts won by Cambridge Analytica and was called "effectively a shell" - until March 16, four days after the Observer contacted Facebook for comment.

Zuckerberg has since apologised for what he called a "breach of trust" in full-page newspaper ads in several UK and US newspapers.

On Tuesday, it was reported Zuckerberg will testify before US Congress on the Cambridge Analytica leak, though he declined to answer questions from UK lawmakers.

Irrespective of Facebook's culpability, the scandal has tapped into ongoing concerns about how careful the platform is with users' data - and how the company has been used to influence political outcomes.

This latest controversy does little to assuage fears that Facebook is unable or unwilling to prevent third parties from using it to further interests that go against those of its users.

From Aljazeera.com 29 Mar 2018.

FIGURE Q1

(a)   Explain which security goal is compromised.

(4 marks)

(b)   Identify any asset property.

(2 marks)

(c)   Determine the value of the asset that you answer in **Q1(b)**?

(4 marks)

(d)   Analyze the vulnerability based on **Figure Q1**.

(5 marks)

(e)   Outline the control measure based on **Figure Q1**.

(6 marks)

(f)   Specify the limitation of the control measure you have mentioned in **Q1(e)**.

(4 marks)

Q2   (a)   Discuss suitable cipher(s) to provide the confidentiality, integrity and authenticity for a lightweight Wireless Body Area Network (WBAN) to transmit patients' data to the doctors.

(9 marks)

(b)   Describe **FOUR (4)** advantages of WBAN.

(8 marks)

(c)   State **FIVE (5)** challenges of WBAN.

(5 marks)

(d)   Draw the IEEE 802.15.6 Message Authentication Code (MAC) frame format (including frame size) for WBAN.

(3 marks)

CONFIDENTIAL

Q3   WhatsApp and Facebook chat are two commons secure messaging apps that are widely used in recent year. These two secure messaging apps had a user based up to billion. Based on the investigation, both apps have the same security level in protecting the users' messages.

    (a)   Does WhatsApp and Facebook protect user's privacy? Justify your answer.

(3 marks)

    (b)   Illustrate **THREE (3)** main reasons what exactly make these apps most popular messaging application in the world.

(6 marks)

    (c)   Describe **TWO (2)** security mechanisms provided by both apps.

(4 marks)

    (d)   Discuss **THREE (3)** weaknesses in term of security for both apps.

(6 marks)

    (e)   Based on your findings in **Q3(d)**, outline the security control measures for WhatsApp and Facebook.

(6 marks)

Q4   (a)   Using an appropriate diagram, explain the architecture of fog computing.

(9 marks)

    (b)   Outline **FOUR (4)** advantages of fog computing infrastructures in education.

(12 marks)

    (c)   State **FOUR (4)** similar paradigms of fog computing.

(4 marks)

- END OF QUESTION -