



UNIVERSITI
TEKNOLOGI
PETRONAS

FINAL EXAMINATION MAY 2024 SEMESTER

COURSE : TAM5123 – REAL TIME ANALYTICS
DATE : 10 AUGUST 2024 (SATURDAY)
TIME : 2:30 PM – 6:30 PM (4 HOURS)

INSTRUCTIONS TO CANDIDATES

1. Answer **ALL** questions in the Answer Booklet.
2. Begin **EACH** answer on a new page in the Answer Booklet.
3. Indicate clearly answers that are cancelled, if any.
4. Where applicable, show clearly steps taken in arriving at the solutions and indicate **ALL** assumptions, if any.
5. **DO NOT** open this Question Booklet until instructed..

Note :

- i. There are **FIVE (5)** printed pages in this **double-sided** Question Booklet including the cover page .

1. Real-time analytics is a set of techniques for processing data as soon as it becomes available:

a. Propose a typical scenario of an analytical problem related to oil and gas that you believe is well suited for real-time analytics.

[5 marks]

b. Discuss the main components of the real-time analytics process for the scenario you propose in **part (a)**.

[10 marks]

c. Draw the architecture diagram for the real-time analytics process you proposed in **part (a)**.

[10 marks]

2. InfluxDB is a time series database designed to efficiently store and query large volumes of time-series data, making it ideal for high-frequency data like IoT sensor data, server metrics, or financial data.
- Discuss the “TICK” platform showing the role of each of its components.
 - Illustrate using diagram the architecture of InfluxDB.
 - Propose with justification any real-time analytics scenario that you believe is suitable to be solved using InfluxDB.
 - Using InfluxDB commands, create any **TWO (2)** measurements for the proposed scenario and insert **ONE (1)** datapoint in each.

[25 marks]

3. Imagine an email service provider handling millions of emails daily. Azure Stream Analytics processes incoming email streams in real-time, applying machine learning models to classify emails as spam or non-spam. Spam emails are automatically diverted to quarantine or flagged for review, ensuring that users receive only legitimate messages in their inboxes.
- Discuss in detail how machine learning can be implemented in azure streaming analytics to solve the above scenario.
 - Using Azure Streaming Analytics, Develop the dataflow diagram showing all of your steps.

[25 marks]

4. You work for a smart city initiative that collects and analyzes data from various IoT sensors deployed across the city. The sensors measure environmental parameters like temperature, humidity, air quality, and noise levels. Your task is to implement a real-time monitoring and analytics system using InfluxDB for this scenario by creating the required measures and inserting **ONE(1)** sample data into each measure.

[25 marks]

- END OF PAPER -

