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| **Register No.** |  |  |  |  |  |  |  |  |  |  |

**SET A**

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY FACULTY OF ENGINEERING & TECHNOLOGY SCHOOL OF COMPUTING

Cycle Test – II

Academic Year: 2023-2024

Program : M.Tech Int - DS

Course Code and Title : 21CSE373T – Streaming Analytics

Year / Sem: III/VI Max. Marks: 40

Duration : 75 mins Date of Exam: 02-04-2024

|  |  |  |
| --- | --- | --- |
| **Course Learning Outcomes (CO):** | | *At the end of this course, learners will be able to:* |
| CO-1: | *illustrate the concepts and terminologies in stream processing* | |
| CO-2: | *Interpret stream processing applications using Apache Spark Streaming* | |
| CO-3: | *Summarize real-time streaming data pipelines and applications that adapt to the data streams using Kafka* | |
| CO-4: | *Interpret stream processing applications using Apache Storm Streaming* | |
| CO-5: | *inquire real time data using NoSQL databases & MongoDB* | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question No.** | **Reference to Outcome** | **Marks Allotted (Total 25)** | **Marks Scored** | **Outcomes Met**  **Yes / No** |
| 1 | 3 | 1 |  |  |
| 2 | 3 | 1 |  |  |
| 3 | 3 | 1 |  |  |
| 4 | 3 | 1 |  |  |
| 5 | 3 | 1 |  |  |
| 6 | 4 | 1 |  |  |
| 7 | 4 | 1 |  |  |
| 8 | 4 | 1 |  |  |
| 9 | 4 | 1 |  |  |
| 10 | 4 | 1 |  |  |
| 11 | 3 | 5 |  |  |
| 12 | 3 | 5 |  |  |
| 13 | 4 | 5 |  |  |
| 14 | 4 | 5 |  |  |
| 15 | 4 | 5 |  |  |
| 16 | 3 | 10 |  |  |
| 17 | 3 | 10 |  |  |

Faculty Name: Signature:

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

**Set A**

FACULTY OF ENGINEERING & TECHNOLOGY SCHOOL OF COMPUTING

Cycle Test – I Academic Year: 2023-2024

Program : M.Tech Int - DS

Course Code and Title : 21CSE373T – Streaming Analytics

Year / Sem: III/VI Max. Marks: 40

Duration : 75 mins Date of Exam: 22-02-2024

**PART-A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl. No** | **Question** | **CLO** | **Bloom’s Taxonomy** | **Marks** |
| 1 | Which of the following in Kafka is a closest analogy to a database table or a folder in a file system?  a) topic  b) partition  c) bucket  d) producer | 3 | L1 | 1 |
| 2 | The default retention rate for Kafka messages is ----------------   1. Two hours 2. Half day 3. 7 days 4. 2 days | 3 | L1 | 1 |
| 3 | -------------- time is the time, the event arrived at Kafka broker and stored there   1. Event 2. Log append 3. Queuing 4. Analysis | 3 | L1 | 1 |
| 4 | Kafka uses Apache ----------- to maintain the list of brokers that are currently members of a cluster  a) Storm  b) Zookeeper  c) Mesos  d) Spark | 3 | L1 | 1 |
| 5 | Select the feature NOT supported by Kafka   1. A partition can be read by multiple consumers in a consumer group   b) A partition can be read by a single consumer in a consumer group  c) A consumer from a consumer group can read from multiple partitions  d) A partition can be read from two consumers from two different consumer groups | 3 | L1 | 1 |
| 6 | Nimbus is -------------- and stores its data in Zookeeper  a) stateful  b) stateless  c) workerless  d) taskless | 4 | L1 | 1 |
| 7 | The basic unit of data that can be processed by a Storm application is called a ---------------------  a) event  b) tuple  c) record  d) field | 4 | L1 | 1 |
| 8 | The root interface used to define spouts is ------------  a) ISpout  b) IRichSpout  c) ISpoutOutputCollector  d) IBaseSpout | 4 | L1 | 1 |
| 9 | A ---------- is the processing powerhouse of a Storm topology and is responsible for transforming a stream  a) nimbus  b) spout  c) bolt  d) executor | 4 | L1 | 1 |
| 10 | Which one of the following files are used to set the configuration parameters of Nimbus and Supervisors in Apache Storm?  a) config.xml  b) settings.xml  c) storm.yaml  d) stormstream.yaml | 4 | L1 | 1 |

PART – B

Answer **any** **Four** questions 4 **X 5 = 20 Marks**

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| --- | --- | --- | --- | --- |
| **Sl. No** | **Question** | **CLO** | **Bloom’s Taxonomy** | **Marks** |
| 11 | Compare the stream processing design patters Multi phase processing and Processing with local state | 3 | L2 | 5 |
| 12 | With example and clear diagrams detail on consumer groups in Kafka and how the consumers in consumer groups read from different partitions. | 3 | L2 | 5 |
| 13 | With clear diagrams, detail on what are the different ways of scaling a Kafka topology and when you will use each. | 3 | L2 | 5 |
| 14 | List and discuss the different options or commands that can be used on a Storm cluster. | 4 | L2 | 5 |
| 15 | Detail on the Storm data model and operating modes of a cluster. | 4 | L2 | 5 |

PART C

Answer any **One** question **1\*10=10**

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| --- | --- | --- | --- | --- |
| **Sl.No** | **Question** | **CLO** | **Bloom’s Taxonomy** | **Mar ks** |
| 16. | a) With code snippets and diagram, detail on the steps in Streaming WordCount of Kafka Streams  b) Summarize on parallelism of a Storm topology with respect to worker process, executors and tasks with clear diagrams. | 3  4 | L3 | 5  5 |
| (OR) | | | | |
| 17. | a) With code snippets and diagram, detail a sample Storm topology with simple spouts, bolt and topology builder.  b) Detail on creating consumers, producers, partitions, topics and exchange of messages in Kafka. | 3  4 | L3 | 5  5 |