MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY
P.O. Box 972-60200 – Meru-Kenya
Tel: +254(0) 799 529 958, +254(0) 799 529 959, + 254 (0) 712 524 293,
Website: info@must.ac.ke Email: info@must.ac.ke

University Examinations 2023/2024

THIRD YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE DATA SCIENCE

CDS 3350: CLOUD AND BIG DATA ANALYTICS

DATE: APRIL 2024   **TIME: 2 HOURS**

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

a) Define large-scale systems and analyze the effect of scale on system properties.

(8 marks)

b) Explain issues in large-scale systems such as virtualization, service orientation, and composition.   (7 marks)

c) Discuss the importance of availability, locality, performance, and adaptation in large-scale systems.   (8 marks)

d) Evaluate different models for large-scale systems including system models for analysis, architectural models, and service/deployment models.   (7 marks)

QUESTION TWO (20 MARKS)

a) Define and explain basic scaling techniques used in large-scale systems.   (6 marks)

b) Analyze scalable computing techniques for architectural models in large-scale systems.

(7 marks)

c) Discuss the role of middleware in scaling large-scale systems.   (7 marks)

QUESTION THREE (20 MARKS)

a) Describe the role of middleware in large-scale systems for computing, storage, web, and content distribution.   (6 marks)

b) Analyze the requirements and challenges associated with Internet-scale systems or services.   (7 marks)

c) Discuss the environmental and application requirements for large-scale systems.

(7 marks)

QUESTION FOUR (20 MARKS)

a) Define Big Data Analytics and its significance in the cloud environment.   (5 marks)

b) Explain the concept of APIs (Application Programming Interfaces) in the context of Big Data Analytics in the Cloud.   (5 marks)

c) Analyze the required layers in the Big Data Software Stack for effective analytics.

 (5 marks)

d) Discuss new software requirements for advanced analytics in Big Data environments.

(5 marks)

QUESTION FIVE (20 MARKS)

a) Identify the new hardware requirements for advanced analytics in Big Data environments.

(5 marks)

b) Discuss the importance of hardware optimization in achieving efficient analytics performance.   (5 marks)

c) Analyze the challenges and considerations in selecting hardware for Big Data analytics.

(5 marks)

d) Propose strategies for mitigating hardware-related bottlenecks in Big Data analytics.

(5 marks)