

**BCS THE CHARTERED INSTITUTE FOR IT**

BCS HIGHER EDUCATION QUALIFICATIONS  
BCS Level 5 Diploma in IT

**BIG DATA MANAGEMENT**

Tuesday 15th April 2025 - Afternoon

Answer **any** FOUR questions out of SIX. All questions carry equal marks.

Time: TWO hours

**Answer any Section A questions you attempt in Answer Book A**  
**Answer any Section B questions you attempt in Answer Book B**

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are NOT allowed in this examination.
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**Section A**  
**Answer Section A questions in Answer Book A**

**A1.**

- a) Describe the main challenges for organisations in implementing a Big Data strategy and explain the ways in which these challenges could be addressed.  
**(10 marks)**
- b) Describe what you understand by the term 'data quality' and explain why it is important.  
**(8 marks)**
- c) Define personal data as described in the General Data Protection Regulation (GDPR) and outline **five** examples of such.  
**(7 marks)**

**A2.**

- a) Explain the advantages of both in-house and outsourced solutions for Big Data.  
**(10 marks)**
- b) Explain the main risks in implementing an in-house Big Data solution and describe the steps that can be taken as mitigation.  
**(10 marks)**
- c) Describe the main financial cost components in the implementation of a cloud-based solution for Big Data.  
**(5 marks)**

**A3.**

- a) Explain the relationship between Artificial Intelligence (AI) and Big Data.  
**(10 marks)**
- b) Explain what you understand by the term 'data modelling'.  
**(5 marks)**
- c) Explain what you understand by the term 'streaming data'.  
**(5 marks)**
- d) Describe with examples, structured, semi-structured, and unstructured data.  
**(5 marks)**

**Section B**  
**Answer Section B questions in Answer Book B**

**B4.**

- a)
- i. Describe the volume characteristic of Big Data and give an example of typical magnitudes of big data volumes you might expect from **two** different sources.  
**(5 marks)**
  - ii. Describe the velocity characteristic of Big Data and give **two** examples of typical rates of high velocity data that might be found in a big data task.  
**(5 marks)**
- b) Your organisation is undertaking a planning exercise to scope the requirements for the introduction of big data facilities throughout the business. You are asked to consider some particular challenges that big data has for the provision of facilities.
- i. Explain the challenge that big data has for infrastructure including staff.
  - ii. Explain the challenge of big data storage provision.
  - iii. Explain the challenge for provision of appropriate big data processing technologies and give an example of a big data processing technology.  
**(15 marks)**

**B5.**

- a) Explain the operating principles and typical use for the following three types of data store.
- i. Extensible.
  - ii. Key-Value.
  - iii. Document.  
**(15 marks)**
- b) Explain some key features of the MongoDB database and give an example of a typical application.  
**(10 marks)**

**B6.**

- a) Explain how Brewer's theorem describes a triple constraint for a distributed database system running on a cluster.  
**(10 marks)**
- b) Explain some of the principal features of the Apache Cassandra distributed database system and state how these features are effective in handling big data tasks.  
**(15 marks)**

**END OF EXAMINATION**