PAN AFRICA CHRISTIAN UNIVERSITY
Where Leaders are Made

UNIVERSITY EXAMINATIONS: 2025/2026

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

BIT /BSIT 405/207

E-COMMERCE AND CLOUD COMPUTING

END TERM EXAMINATION

DATE: THURSDAY 30TH JULY 2026 **TIME: 3 HOURS**

INSTRUCTIONS: Question One is Compulsory, Choose Three Other Questions

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SECTION A (COMPULSORY)

QUESTION ONE (15 Marks) Compulsory

A rapidly expanding retail business in Nairobi is transitioning from a traditional brick-and-mortar model to a fully integrated online platform. They require a robust, cloud-hosted architecture that can manage high transaction volumes and secure customer data.

a) **Architect** a scalable cloud-based e-commerce system for this retailer. Your design must explicitly detail how you will integrate mobile money (M-PESA) for seamless online payments while ensuring full compliance with the Kenya Data Protection Act 2019 regarding customer data privacy. **(6 marks)**

b) **Evaluate** the operational suitability of using an Infrastructure as a Service (IaaS) model versus a Software as a Service (SaaS) model for hosting this new platform, taking into consideration that the retail company currently has limited in-house IT and cloud engineering expertise. **(5 marks)**

c) **Analyze** the implications of the Shared Responsibility Model on this proposed architecture. Determine exactly which security, compliance, and governance responsibilities will fall on the retail business versus the chosen major cloud provider (e.g., AWS, Azure, or Google Cloud Platform). **(4 marks)**

SECTION B: (ANSWER ANY THREE (3) QUESTIONS IN THIS SECTION)

QUESTION TWO (15 marks)

a) **Design** an integrated digital marketing strategy that leverages both Search Engine Optimization (SEO) and Search Engine Marketing (SEM) , alongside social commerce , to drive customer acquisition for a new Direct-to-Consumer (D2C) brand. **(8 marks)**

b) Analyze how the implementation of Customer Relationship Management (CRM) tools and data analytics can be utilized by an online retailer to personalize the mobile commerce experience and increase long-term customer retention. **(7 marks)**

QUESTION THREE (15 marks)

a) **Evaluate** the risks and benefits associated with deploying a Hybrid Cloud versus a Public Cloud model. Base your evaluation on the specific needs of a highly regulated financial institution looking to modernize its online services. **(8 marks)**

b) **Compare and contrast** the characteristics and optimal use cases for cloud storage solutions like AWS S3 or Azure Blob against structured database deployments within a cloud-native web application. **(7 marks)**

QUESTION FOUR (15 marks)

a) **Formulate** a deployment strategy that justifies the use of Docker containerisation versus serverless computing (e.g., AWS Lambda) for an e-commerce platform that experiences highly unpredictable traffic spikes during holiday sales. **(8 marks)**

b) **Create** a comprehensive cloud security and governance framework designed to protect a multi-cloud enterprise environment against data breaches and unauthorized access. **(7 marks)**

QUESTION FIVE (15 marks)

a) **Recommend** specific cost optimization and performance management strategies for an e-commerce startup that is currently experiencing unexpectedly high cloud infrastructure billing due to unoptimized resource provisioning. **(8 marks)**

b) **Analyze** the potential disruptive impact of emerging trends such as Artificial Intelligence (AI) in e-commerce and the Internet of Things (IoT) on the future supply chain operations and customer service automation of digital commerce platforms. **(7 marks)**

QUESTION SIX (15 marks)

a) **Evaluate** the primary structural and operational differences between Business-to-Business (B2B) and Business-to-Consumer (B2C) e-commerce models. How can a Platform as a Service (PaaS) cloud model specifically accelerate the development lifecycle of a B2B platform? **(8 marks)**

b) **Formulate** a secure transactional flow that integrates an online payment system into a web-based checkout interface, focusing on mitigating fraud and ensuring transactional integrity across the e-commerce infrastructure. **(7 marks)**