

	Pakistan Institute of Public Finance Accountants	May Exam-2026 [08.May.2026 [09:30 am – 12:15 pm] Additional time – 15 min for Paper Reading	
Database Management System (Application) AGP PG PUBLIC Sectors			
Marks-80	Subjective	Duration: 02 Hours 30 Minutes	

[Instructions]

- Ensure that the question paper delivered to you is the same, in which you intend to appear.
- Read the instructions given on the title page of Answer Script.
- Start each question from fresh page.

Books Allowed:

- The Relational Database by John Carter
- Fundamentals of Database Systems by Ramez Elmasri & Shamkant B. Navathe

Attempt all questions

Q.1. Explain the following (any five)

10

- (a) Domain
- (b) Entity
- (c) Relationship
- (d) Covering Constraint
- (e) Weak Entity Set
- (f) Aggregation
- (g) Role Indicator

Q.2. RiftCart, an online retail giant, has experienced unprecedented growth in recent years. Their operations generate massive amounts of data daily, classified into the following three types:

- Customer purchase records from their website (structured)
- Millions of customer reviews and social media comments (unstructured)
- Real-time clickstream data from user navigation (semi-structured)

Before making a purchase, new customers are required to sign-up on the RiftCart website while the existing customers must sign in. Occasionally, customers are asked to confirm their account details.

During peak shopping seasons like Ramadan, their system process thousands of transactions per hour. Marketing campaigns rely on immediate analysis of customer engagement to tailor offers. However, the volume and diversity of incoming information have begun to strain RiftCart's data infrastructure, leading to occasional inconsistencies in customer profiles and slow reporting for their sales teams.

Required:

- (a) Identify and briefly explain three "Vs" (Volume, Velocity, Variety) of Big Data that are clearly demonstrated in the above situation. For each "V" identified, explain its implication for RiftCart's operations. **12**

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(2)

- (b) Considering the issues RiftCart is experiencing, specifically, inconsistencies in customer profiles caused by data diversity and delays in reporting due to high data volume, identify any TWO data-related challenges RiftCart is explicitly encountering. For each challenge, suggest ONE emerging technology or trend that could address it, and clearly justify how it would be effective. **08**
- Q.3.** (a) Compare Relational Database Management Systems (RDBMS) with Object Oriented Database Management System (OODBMS), detailing their respective strengths and the types of data they are best suited to manage. **10**
- (b) Explain the primary characteristics and typical applications of NoSQL databases. **05**
- (c) Discuss how the Network Model, characterized by its 'graph-like structure', facilitates management of complex many-to-many relationships. Support your explanation with a relevant example. **05**
- Q.4.** (a) What are different types of SQL Statements? **08**
- (b) What is the difference between DDL and DML? **03**
- (c) Differentiate between Scalar and Aggregate Functions. **04**
- Q.5.** NewTrends, a growing online fashion retailer, faces significant data management challenges. Sales data from various online marketplaces is stored in disparate Excel spreadsheets, while internal transactional data resides in an older SQL database. This fragmentation leads to conflicting sales figures and manual, inconsistent data consolidation processes.
- Furthermore, customer support access sensitive customer data using generic logins and a recent security incident involved an unmonitored marketing database being breached, leading to customer phishing. The company lacks sufficient IT staff and formal data governance. This current data chaos prevents NewTrends from effectively leveraging data for strategic decision-making, such as predictive analytics for demand forecasting.
- Required:**
- (a) Identify and explain any THREE specific inadequacies in 'NewTrends' current systems and processes for collecting, storing and reporting data and information. For each inadequacy, refer to relevant data concepts and their implications. **07**
- (b) Suggest ONE distinct Technological Control or IT General Control (ITGC) that 'NewTrends' could implement to address each inadequacy identified in Part (a). Explain how each proposed control would enhance 'NewTrends' ability to make better decisions and improve overall operational efficiency. **08**
