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Assignment : Cloud Computing Case Study – Online Learning Platform

Batch : B3

Section A: Understanding the Need for Cloud

Q1. Explain why cloud computing is suitable for the given startup.

- **Scalability for Fluctuating Traffic:** Cloud allows the platform to handle huge spikes during exam seasons without crashing and scale down during vacations
- **Cost Efficiency:** The "limited initial budget" is protected because there is no need to buy expensive physical servers upfront
- **Speed to Market:** Cloud provides ready-made tools for video streaming and authentication, enabling the "fast deployment" the startup requires
- **Resource Management:** The startup can focus on building the learning content rather than managing hardware

Section B: Cloud Deployment Model Analysis

Q2. Choosing the Cloud Type

- **a) Recommended Type: Public Cloud**
- **b) Justification:**
 - **Cost:** No upfront capital expenditure (CapEx); it follows a pay-as-you-go model which fits the limited budget
 - **Scalability:** Offers near-infinite resources that can be added instantly during traffic spikes
 - **Security:** High-level security is managed by the provider, which is helpful for a small startup team
 - **Operational Overhead:** The cloud provider handles all physical hardware and networking maintenance

Q3. Business Growth Scenario

- **a) Continue with same type?** No
- **b) Suggested Type & Why: Hybrid Cloud**
 - **Control:** Sensitive student data and university partner records can be kept on a Private Cloud for strict compliance
 - **Flexibility:** The platform can still use the Public Cloud to host video streaming and handle high exam traffic efficiently

Section C: Cloud Service Model Evaluation

Q4. Choosing the Service Model

- **a) Recommended Model: PaaS (Platform as a Service)**
- **b) Why others are less suitable:**
 - **IaaS:** Requires too much manual work to manage Operating Systems and networking, slowing down time-to-market
 - **SaaS:** Too restrictive; it wouldn't allow the startup to build their own unique features like custom quizzes and analytics

Q5. Shared Responsibility Model (for PaaS)

Component	Responsible Party
Infrastructure	Cloud Provider
Operating System	Cloud Provider
Application Code	User (Startup)
Scaling	Cloud Provider (Auto-scaling features)
Security Patches	Cloud Provider (for OS/Platform)

Section D: Scalability & Performance

Q6. Handling Fluctuating Traffic

- **Sudden Spikes:** Uses **Auto-scaling** to automatically add more server instances when traffic hits its peak during exams²².
 - **Reduced Traffic:** Uses **Elasticity** to shut down unused resources during off-peak times, ensuring the startup doesn't pay for idle power²³.
 - **Load Balancing:** Distributes incoming student traffic evenly across servers to prevent any single point of failure²⁴.
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Section E: Cost Optimization

Q7. Cost Management in Cloud

- **Pay-as-you-go Benefits:**
 - **No Waste:** The startup only pays for the exact amount of storage and bandwidth used each month²⁵.
 - **Low Entry Barrier:** Allows the startup to begin operations with almost zero "Initial Budget"²⁶²⁶²⁶.
 - **Operational Savings:** Eliminates the cost of electricity, cooling, and physical security for a data center²⁷.