

Exam.	Back		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Enterprise Computing (Elective I) (CT72507)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.

1. What is enterprise computing? Briefly explain about the information systems that are used by function units of an enterprise. [8]
2. The paradigm for computing has drastically changed over the years. Discuss what has happened compared to the past and give retrospective for future of computing. [8]
3. The department of transport management wants to make a choice between monolithic, SOA, and microservices-based architecture for its system development. Make a comparison between these architecture and give an appropriate recommendation. [4+4]
4. What is cloud computing? Why should Enterprises consider using cloud services? Describe about IaaS, PaaS and SaaS including their use case examples. [1+2+4+3]
5. Why global cloud infrastructure is required? Discuss about it for AWS, Azure and GCP by focusing the application domain. Also, discuss about the pillars of the Well-Architected Framework. [2+3+3]
6. What are the different types of storage services available in the cloud? Explain each storage type with its use case. [2+3]
7. A national healthcare management system provides online services such as patient record access, appointment booking, and digital prescriptions. The platform experiences heavy traffic during vaccination drives and seasonal outbreaks. To ensure reliability and scalability, the system must incorporate effective domain name resolution, distribution of traffic across multiple servers, continuous monitoring, and automated alerting in case of failures.

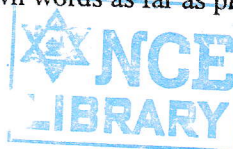
As a solution architect design a robust architecture for this healthcare platform that ensures high availability and performance. Your design should describe the role of DNS management, load balancing, system monitoring, and anomaly detection with notification mechanisms. Illustrate the essential components required for successful deployment. [2+3]
8. In the context of modern enterprise systems, how can a company effectively integrate Enterprise analytics and search functionalities to enhance decision-making and operational efficiency? [8]
9. IoE is considering hosting its MIS system in the cloud. [5+3]
 - a) Make an estimation of monthly/yearly cost if the following on demand services with utilization 16 hours/day are used from the cloud service provider.

SN	Service	Charge Unit	On-Demand cost NPR
1	Virtual Server (4 vCPUs, 32 GiB Memory, and Up to 10 Gigabit)	Hourly	12
2	100 GB SSD Block Storage	Monthly	20
3	SQL Server instances on virtual server 4 vCPUs and 32 GiB Memory	Hourly	60
4	500GB Storage for Database	Monthly	25

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BEX, BCT	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Enterprise Computing (Elective I) (CT72507)

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- ✓ Attempt All questions.
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1. Compare the key characteristics Mainframe Architecture to Client-Server Architecture. How has the shift from Mainframe to current computing paradigm impacted enterprise IT environments? [3+5]
2. What is Grid Computing and how does it differ from Cluster Computing? Justify your explanations with appropriate use cases, diagrams and explanations. [8]
3. Has Nepalese Government made a structured framework for developing and managing the government's IT assets and services? Explain with reference to the documents published the government. [8]
4. What is Cloud computing? Why Should Enterprises consider using cloud services? Describe about IaaS, PaaS and SaaS including their use case examples. [2+2+4]
5. Why Global Cloud Infrastructure is required? Discuss about it for AWS, Azure and GCP by focusing the application domain. Also, discuss about the pillars of the Well-Architected Framework. [2+2+4]
6. File Storage, Block Storage and Object Storage are essential components in almost all scalable infrastructure designs with few alternative available. Describe each of these storage options and list the cases where we use these storage options. [6]
7. An integrated government e-services portal offers citizens access to a range of online services, including tax filing, driver's license renewals, and public records searches. The portal must handle high volumes of user traffic, particularly during peak periods such as tax season or application deadlines. As a solution architect, design a system that incorporates effective DNS management, load balancing, and monitoring, with capabilities for sending notifications in the event of anomalies. Propose an architecture for this system, highlighting the essential components required for its deployment. [8]
8. In the context of modern enterprise systems, how can a company effectively integrate Enterprise Analytics and Search functionalities to enhance decision-making and operational efficiency? [6]
9. A financial institution is considering hosting its core banking system in the cloud.
 - a) Make an estimation of Monthly/Yearly cost if the following On Demand services with utilization 16hours/day are used from the cloud service provider. [4+4]

SN	Service	Charge Unit	On-Demand cost NPR
1	Virtual Server (6 vCPUs, 48 GiB Memory, and Up to 15 Gigabit)	Hourly	18
2	40 GB SSD Block Storage	Monthly	14
3	SQL Server instances on virtual server 6 vCPUs and 48 GiB Memory	Hourly	90
4	750GB Storage for Database	Monthly	35

- b) If the pricing model for the virtual server is adjusted to a 1-year reserved instance plan costing NRs 80,000 with no upfront payment, will this change the hourly cost for the server? Justify your answer with appropriate calculations.

10. Write short notes on:

[3×4]

- a) Authentication Vs Authorization in Scalable Architecture
- b) Autoscaling and its use cases
- c) Future of Enterprise Computing
