THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

JANUARY – APRIL 2019 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE

REGULAR PROGRAMME

CMT 308: DISTRIBUTED SYSTEMS

Date: APRIL 2019	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

Q1. a) Describe the following concepts as used in distributed Information systems. **(6 marks)**

i) Clusters
ii) Grid computing
iii) Cloud computing

b) With the advent of PCs, the processing could be distributed between clients and servers. Identify and describe the **FOUR** tiers in the client/server architectures. **(8 marks)**

c) Catholic University wants to implement a distributed Information system. Advice the university on a specific middleware to choose to be used in their distributed system. Justify the choice of your middleware. **(6 marks)**

d) Discuss the concept of pervasive computing, clearly identifying the principles of pervasive computing as identified by Mark D. Weiser. **(6 marks)**

e) What is 'transparency' as used in distributed systems and what role does it play in distributed information systems. **(4 marks)**

Q2. a) List ANY **THREE** types of transparency **(3 marks)**

b) Most modern distributed DBMS available in the market today address the concept of concurrency. Define concurrency and describe the **ACID** property of transaction with respect to concurrency. **(8 marks)**

c) A distributed system is one in which components located at networked computers communicate and coordinate their actions only by passing messages. Discuss **THREE** characteristics of distributed information system based on this definition. **(9 marks)**

Q3. a) Identify and describe ANY TWO types of standards that are of relevance to distributed information systems development. **(8 marks)**

b) Describe ANY THREE security attacks that distributed information systems could be faced with. **(6 marks)**

c) Discuss how fault tolerance may be achieved in distributed systems. **(6 marks)**

Q4. a) Describe the concept of openness as used in distributed information systems. **(6 marks)**

b) Scalability is an importance component of distributed systems. Identify and describe THREE dimensions that may scale **(9 marks)**

c) Describe interoperability as used in distributed systems. **(5 marks)**

Q5. a) There are THREE service models from which you can choose a cloud solution. Discuss these models. **(9 marks)**

b) Describe the importance of a service level agreement between a provider and a consumer of cloud services **(5 marks)**

c) Describe the features of Elasticity Cloud compute (EC2) service. **(6 marks)**

END