msc. CS Sem. III

2097766

Paper / Subject Code: 94814 / Computer Science:Ubiquitous Computing

(2 ½ Hours) [Total marks: 60

N. B.: (1) **All questions** are **compulsory**
(2) **Figures** to the **right** indicate **full marks**.
(3) **Assume additional data if necessary** but state the same clearly.
(4) **Symbols have their usual meanings** unless stated otherwise.

Q.1 Attempt **any two** of the following **(12)**

a) Compare between Implicit and Explicit Human–Computer Interaction. Explain the concept by giving suitable example. 6

b) Write a note on partitioning and distribution of service components with reference to smart devices and services. 6

c) Briefly explain how wearable smart devices and implants help in implementing and experiencing ubiquitous computing. 6

d) Explain the Abstraction and Virtualization approaches for reducing complexity of Ubiquitous System. 6

Q.2 Attempt **any two** of the following **(12)**

a) What is Mobile Code? What are the benefits and challenges of Code Mobility? Explain with suitable example. 6

b) What is a Smart Card? Briefly explain different types of smart cards. Also list salient features of smart card operating system. 6

c) Compare and contrast a micro-kernel operating system with a monolithic operating System. Which is better for use in hand-held mobile devices? 6

d) Write a note on use of multimodal interface in Ubiquitous system design. 6

Q.3 Attempt **any two** of the following **(12)**

a) What is the use of Tagging in Ubiquitous system interaction? Discuss any one application of Tagging in detail. 6

b) What are Sensor Net? List and explain various challenges in designing and deploying sensors. 6

c) What is MEMS? List and briefly explain any three applications of MEMS. 6

d) Differentiate between hard RTS and soft RTS. Give example of each type of RTS. 6

Q.4 Attempt **any two** of the following **(12)**

a) List and explain benefits to using wireless networks for UbiCom Systems. 6

b) What is Ubiquitous Networks? Give examples. Also list various characteristics of such network. 6

c) List and explain important Network Design Issues when designing and operating Ubiquitous systems. 6

d) Briefly describe the network models that can provide universal access to heterogeneous services. 6

Q.5 Attempt **any two** of the following **(12)**

a) Describe the Holistic Framework for UbiCom Systems. 6

b) Write a note on Hidden UI Via Basic Smart Devices. 6

c) Explain how control systems are important as any other component in designing Ubiquitous systems. List various type of Feedback Control. 6

d) Write a note on Audio and Video (AV) broadcast Content Based Networkss. 6

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(5) Use of **calculators** and statistical tables are **allowed**.

Q.1	Attempt **any two** of the following	(12)
a)	How method implemented on other computer can be used? Why remote methods are required in cloud computing?	6
b)	Explain two reference models for achieving the communication among processes in Cloud computing.	6
c)	Explain reference architecture of Cloud computing Distributed system.	6
d)	How load balancing is achieved in cloud computing?	6
Q.2	Attempt **any two** of the following	(12)
a)	Discuss various types of clouds along with their applications.	6
b)	Describe Web services and mashup architectures for integration over the Internet.	6
c)	What are enterprise components used in Cloud computing? Explain the component view of enterprise architecture.	6
d)	What is a middleware? Explain platform as a service reference model.	6
Q.3	Attempt **any two** of the following	(12)
a)	Why thread programming is necessary in developing clouds?	6
b)	When to use SOAP/WSDL Web service or REST Web service in Cloud based applications?	6
c)	Explain virtualization as a mechanism to achieve multi-tenancy at the system level.	6
d)	What is a task? How it is represented? Explain different categories of task computing.	6
Q.4	Attempt **any two** of the following	(12)
a)	With neat figure explain how InstantApps is deployed and used on the Amazon infrastructure cloud as compared to traditional SaaS-based Dev 2.0.	6
b)	What is Dev 2.0 paradigm? What are its advantages in Cloud computing?	6
c)	How the layered architecture is implemented in practice? Give an example.	6
d)	Explain user interface patterns and basic transactions used in developing enterprise applications.	6
Q.5	Attempt **any two** of the following	(12)
a)	How fault tolerance is useful in cloud computing?	6
b)	Differentiate between computation and communication with context to Cloud computing.	6

c) What is data-intensive computing? Explain different technologies used for data-intensive computing. 6

d) What is NoSQL systems? List various implementation of NoSQL. Explain any one in detail. 6

Computer Science

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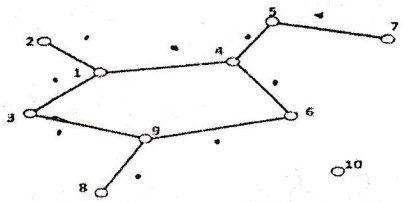
Q.1	Attempt **any two** of the following	(12)
a)	What is DFS? Explain its use in social network analysis.	6
b)	Differentiate between Conventional and social data.	6
c)	Explain different types of relations in a social network.	6
d)	Explain the following with example. i. Path and Walk ii. Egocentric Network.	6
Q.2	Attempt **any two** of the following	(12)
a)	Explain Link analysis in social network with example.	6
b)	Define centrality. Explain Closeness and Betweeness Centrality with example.	6
c)	The given graph represents synthetic social network, For this network define and compute following: i. Density ii. Degree of centrality iii. Connectedness	6
		
d)	What is cliques? Explain following terms with respect to cliques: a) N cliques b) N-clans c) K-cores	6
Q.3	Attempt **any two** of the following	(12)
a)	Explain the concept of equivalence. And explain structural equivalence with example.	6
b)	Explain how to find Manhattan and Euclidean distance with example.	6
c)	How to measure the similarity and dissimilarity of binary relation?	6
d)	Write a short note on Structure hole.	6

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Q.4 Attempt **any two** of the following (12)

a) Explain two-mode factor analysis with example. 6

b) Explain two-mode SVD analysis with example. 6

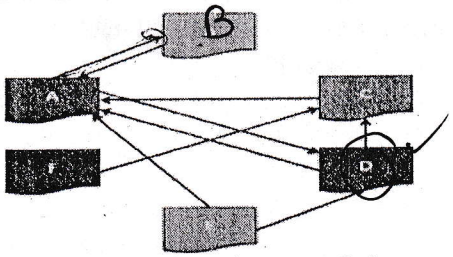
c) Explain Bi-partite data structure use to store two-mode network information. 6

d) Explain Two mode Core-periphery Analysis. 6

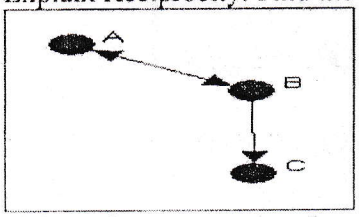
Q.5 Attempt **any two** of the following (12)

a) How adjacency List and Edge List are used to find the relation between the different actors in a social network. 6

b) Find the goggle page rank of A for given graph. If the value of d=0.20, PR(B)=0.65 , PR(C)=1.25 6



c) Explain Reciprocity. Find the reciprocity rate of given graph. 6



d) Write a short note on two mode faction analysis. 6

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Q.1	Attempt **any two** of the following	(12)
a)	Discuss the concept of prediction error. Also explain how it is used.	6
b)	Differentiate between sampling and resampling with an example.	6
c)	Write short note on : 1. Rule induction 2. Nonlinear Dynamics	6
d)	Explain the working of Fuzzy Decision Trees.	
Q.2	Attempt **any two** of the following	(12)
a)	What are key-value pairs? How do they help in Map-reduce implementation?	6
b)	What is recursion? Explain recursive extension to Map-Reduce.	6
c)	How does Grouping by key Works?	6
d)	Explain Matrix-Vector Multiplication using Map reduce.	6
Q.3	Attempt **any two** of the following	(12)
a)	Define the concept of near neighbor search?	6
b)	What is the concept of hashing? Explain hashing shingle with an example.	6
c)	How shingle is built from different words? Explain with an example.	6
d)	How one can find similarity of documents? Discuss the basic method which is used by mirror pages and plagiarism.	6
Q.4	Attempt **any two** of the following	(12)
a)	What do you mean by combining estimate? Explain with an example.	6
b)	Write a short note on : 1. Bloom filter. 2. Real Time Analytics Platform.	6
c)	How does estimating moments helps in stream processing?	6
d)	How does data stream management works.	
Q.5	Attempt **any two** of the following	(12)
a)	How regression modeling works?	6
b)	Discuss any one common Map Reduce Algorithm.	6
c)	Write short note on : 1. LSH of documents 2. Locality sensitive functions	6
d)	Explain Alon-matias-szegedy algorithm for second moments.	

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