SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

M.E-CSE-II SEMESTER

1912211 MOBILE AND PERVASIVE COMPUTING

Regulation – 2019

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SUBJECT :1912211 MOBILE AND PERVASIVE COMPUTING

SEM/ YEAR : M.E- CSE-II / I

UNIT I - INTRODUCTION			
History – Wireless communications: GSM – DECT – TETRA – UMTS – IMT – 2000 – Blue tooth, WiFi, WiMAX, 3G, WATM.- Mobile IP protocols -WAP push architecture-Wml scripts and applications. Data networks – SMS – GPRS – EDGE – Hybrid Wireless100 Networks – ATM – Wireless ATM.			
PART-A			
Q.No	**Questions**	**BT Level**	**Competence**
1	**Define** the main elements of the GSM system architecture.	Remember	BTL1
2	**Draw** the different generations of mobile telecommunication systems.	Analyze	BTL4
3	**List** the different services of GSM.	Remember	BTL1
4	**Define** all drop?	Remember	BTL1
5	**Differentiate** COMS and CLMS.	Analyze	BTL4
6	**What** are the two factors allow for the use of simple transmitter hardware?	Remember	BTL1
7	**Compare** two basic groups of logical channels.	Analyze	BTL4
8	**Differentiate** Transparent bearer services and non-Transparent bearer services.	Understand	BTL2
9	**What** are the four possible handover scenarios in GSM**?**	Remember	BTL1
10	**Justify** the main tasks of the physical layer.	Create	BTL6
11	How would you **classify** SMS vs EMS?	Apply	BTL3
12	**Illustrate** the approaches of 3G radio access technologies.	Apply	BTL3
13	**Show** the reference model for GSM services.	Understand	BTL2
14	**Define** traffic multiframe..	Remember	BTL1
15	**Give** some supplementary services..	Understand	BTL2
16	**Draw** the development of different generations of mobile telecommunication systems.	Evaluate	BTL5
17	How would you **develop** mobility management?	Create	BTL6
18	**Demonstrate** the main components of the UMTS.	Understand	BTL3
19	**Express** the security services offered by GSM..	Apply	BTL2
20	Can you **summarize** the algorithms specified to provide security services?	Evaluate	BTL5
PART B			
1	i) What are the available data rates for HSCSD in GSM (8) ii) What are the specific advantages of each system? (5)	Remember	BTL1
2	Which types of different services does GSM offer? **Give** some examples and reasons why these services have been separated.(13)	Understand	BTL2
3	**Illustrate** the following: i) What are the functions of authentication and encryption in GSM? (7) ii) How is system security maintained? (6)	Apply	BTL3
4	**Explain** in detail about main components of the UMTS reference architecture.(13)	Analyze	BTL4
5	**Explain** all protocol layers and components in more detail about	Evaluate	BTL5

	Bluetooth network in detail.(13)		
6	How much of the original GSM network does GPRS need? **Develop** the elements of the network perform the data transfer?	Create	BTL6
7	**Describe** the high-level view of the UMTS release 99 core network architecture together with a UTRAN RNS and a GSM BSS (13)	Remember	BTL1
8	**Discuss** the following in detail: i) How does UTRA-FDD counteract the near-far effect? (7) ii) Why is this not a problem in GSM? (6)	Understand	BTL2
9	**Illustrate** the functional architecture of a GSM system.(13)	Apply	BTL3
10	**Explain** GPRS architecture reference model.(13)	Analyze	BTL4
11	**Describe** DECT system architecture reference model(13)	Remember	BTL1
12	i) **Summarize** the main features of third generation mobile phone systems. How do they achieve higher capacities and higher data rates?(7) ii) How does UMTS implement asymmetrical communication and different data rates?(6)	Understand	BTL2
13	**i) Explain** in detail about the four possible handover scenarios in GSM.(7) **ii)** Why and when are different signaling channels needed? **Compare** the differences? (6)	Analyze	BTL4
14	i)Exhibit two different basic system architectures (infrastructure-based or ad-hoc).(7) ii)List the several reasons led to the development of WATM.(6)	Remember	BTL1

PART-C

S.No	Questions	BT Level	Competence
1	Looking at the HLR/VLR database approach used in GSM – how does this architecture **limit** the scalability in terms of users, especially moving users. (15)	Analyze	BTL4
2	**Evaluate s**ome key features of the GSM, DECT, TETRA, and UMTS systems. Which features do the systems have in common? Why have the three older different systems been specified? In what scenarios could one system replace another? (15)	Evaluate	BTL5
3	**Develop** UTRA FDD (W-CDMA) frame structure and UTRA TDD (TD–CDMA) frame structure. (15)	Create	BTL6
4	**Evaluate** biggest difference between UMTS and GSM comes with the new radio interface (15)	Evaluate	BTL5

UNIT II OVERVIEW OF A MODERN 4G TELECOMMUNICATIONS SYSTEM

Introduction. LTE-A System Architecture. LTE RAN. OFDM Air Interface. Evolved Packet Core. LTE Requirements. LTE-Advanced. LTE-A in Release. OFDMA – Introduction. OFDM Principles. LTE Uplink—SC-FDMA.

PART A

1	**What** is Peak data rate?	Remember	BTL1
2	**Distinguish** Uplink vs Downlink.	Understand	BTL2
3	**Illustrate** LTE requirements.	Apply	BTL3
4	**Point out** the hard facts for a telecommunications engineer.	Analyze	BTL4
5	**Summarize** the new LTE-A features.	Evaluate	BTL5
6	**Draw** the high-level description of the LTE-A network architecture.	Create	BTL6
7	**Identify** the targets for average spectrum efficiency.	Remember	BTL1

8	**List** out the important LTE-A enhancement.	Remember	BTL1
9	**Give** the advantages and disadvantages of Control-plane latency vs User-plane latency.	Understand	BTL2
10	**Show** SC-FDMA signal processing chain..	Apply	BTL3
11	**What** are the advantages of SC-FDMA?	Remember	BTL1
12	Self-organizing networks? **Discuss** it.	Understand	BTL2
13	**Illustrate** Control-plane capacity.	Apply	BTL3
14	**Point out** the Radio resource management requirements.	Analyze	BTL4
15	**Summarize** E-UTRAN and UTRAN	Evaluate	BTL5
16	**Develop** the function point Mark II model of transaction.	Create	BTL6
17	**Wha**t is Orthogonal frequency division multiple access?	Remember	BTL1
18	**List** out the list of LTE-A enhancements.	Remember	BTL1
19	**Express** MBMS.	Understand	BTL2
20	**Analyze** guard interval.	Analyze	BTL4
PART B			
1	**Discuss** the high-level description of the LTE-A network architecture. (13)	Remember	BTL1
2	**Discuss** the following in detail: i) LTE-A System Architecture. ii) LTE RAN	Understand	BTL2
3	**Demonstrate** the main design principle in EPC with neat diagram.(13).	Apply	BTL3
4	i) D**iscuss** LTE requirements.(7) ii)**Analyze** the details about LTE (6)	Analyze	BTL4
5	**Identify** OFDM advantages over WCDMA.(13)	Remember	BTL1
6	**Discuss** the issues that make LTE-advanced different from the standard Release 8 LTE.(13)	Understand	BTL2
7	**Explain** the description of the LTE RAN network architecture in detail.(13)	Evaluate	BTL5
8	i) **Describe** the requirements of enhanced multimedia broadcast multicast service (MBMS). (13)	Remember	BTL1
9	**Illustrate** the list of requirements for the future LTE system.(13)	Understand	BTL2
10	**Demonstrate** the new enhancements and features that make LTE-A.(13)	Apply	BTL3
11	**Explain** the list of LTE-A in Release 11 enhancements and new features.(13)	Analyze	BTL4
12	**Describe** the single-carrier FDMA (SC-FDMA) in detail. (13)	Remember	BTL1
13	**Discuss** the principles of OFDMA.(13)	Analyze	BTL4
14	**Develop** the simplified OFDM signal processing chain.(13)	Create	BTL6
PART C			
1.	**Estimate** of the performance of the network, though it is good to remember that these numbers are also based on computer simulations and not on measurements in deployed networks. (15)	Evaluate	BTL5
2	**How** the mobility requirements are divided into three classes. (15)	Create	BTL6
3	**Calculate** the Latency improvement in LTE. How the peak data rate	Evaluate	BTL5

	will easily exceed the requirements both in the uplink and in the downlink (15)		
4	**Identify** the various issues that aim to assist network operators in managing LTE networks. (15)	Create	BTL6
UNIT III PERVASIVE CONCEPTS AND ELEMENTS			
Technology Trend Overview - Pervasive Computing - Human–Computer Interaction - Pervasive Transaction Processing - Infrastructure and Devices - Wireless Networks - Middleware for Pervasive Computing Systems - Resource Management - User Tracking Context Management -Service Management - Data Management - Security Management – Pervasive Computing Environments.			
PART A			
1	**List** the pervasive computing electronic devises in market.	Remember	BTL1
2	**Compare** physical and virtual contexts.	Evaluate	BTL5
3	**Differentiate** ubiquitous computing vs mobile computing	Analyze	BTL4
4	**Show** the definition for ubiquitious computing.	Apply	BTL3
5	**How** location information is the most important context in pervasive Computing.	Create	BTL6
6	Pervasive computing projects? **Discuss** it.	Understand	BTL2
7	**What** are the several principles of pervasive computing?	Remember	BTL1
8	**Develop** several types of emerging wireless networks.	Create	BTL6
9	**Define** Collaborative filtering?	Remember	BTL1
10	**Illustrate** structure of a pervasive computing system.	Apply	BTL3
11	**List** out the benefits of pervasive computing.	Understand	BTL2
12	**Analyze** the large variety of challenge faced by application Programmers.	Analyze	BTL4
13	**Define** 'Context management'.	Remember	BTL1
14	**Compare '**exact context reasoning and fuzzy context reasoning'	Evaluate	BTL5
15	**List** out the Key functions of resource management.	Remember	BTL1
16	**Identify** the Roles of ACMS..	Understand	BTL2
17	**Analyze** the middleware often supports mechanisms for efficient Service management.	Analyze	BTL4
18	What do you understand by risk transfer? **Give** an example.	Understand	BTL2
19	**Define** ScudWare.	Remember	BTL1
20	**Classify the** pervasive computing environments.	Apply	BTL3
PART B			
1	**Examine** the two hypothetical scenarios to convey the look and feel of Perspectives of Pervasive Computing.(13)	Remember	BTL1
2	**Illustrate** the various state-of-the-art technology of pervasive Computing. (13)	Apply	BTL3
3	i) **Explain** Pervasive Computing: Concepts. (6) ii) **List and explain the** pervasive computing enablers. (7)	Analyze	BTL4
4	**Classify** the devices in the infrastructure layer on pervasive Computing. (13)	Evaluate	BTL5
5	**Develop** an architecture of pervasive computing systems.(13)	Create	BTL6
6	**Describe** the different functionality of the middleware layer in developing pervasive applications. (13)	Understand	BTL2

7	**Explain** the difficulty in developing pervasive applications lies in several aspects	Analyze	BTL4
8	**Why** pervasive applications need an efficient user tracking method that can identify user positions and trails.(13)	Remember	BTL1
9	Define the term Resource Management and list the Key functions of resource management.(13)	Understand	BTL2
10	**How** Pervasive applications need to adapt their behavior to moving users.(13)	Apply	BTL3
11	**Describe** in detail i) Context management.(7) ii) Service Management.(6)	Remember	BTL1
12	i) **Discuss** about the Data Management in detail. (7) ii) **Discuss** the factors to be considered in Security Management. (6)	Understand	BTL2
13	Draw and **explain** an illustration of iCampus.(13)	Analyze	BTL4
14	i) **What** is ScudWare. (4) ii) **Describe** the features of ScudWare.(9)	Remember	BTL1
	PART C		
1	**Identify and Illustrate** the security challenges in pervasive computing.(15)	Evaluate	BTL5
2	In **what way** middleware's provide different abstractions and system support for applications.(15)	Create	BTL6
3	**Explain** the computers in the Human Interaction Loop (CHIL) project. (15)	Evaluate	BTL5
4	**Create** the comprehensive illustration of existing pervasive middleware. An in-depth analysis of services provided by middleware systems is carried out, and some open research issues are discussed. (15)	Create	BTL6
	UNIT IV HCI IN PERVASIVE COMPUTING		
	Prototype for Application Migration - Prototype for Multimodalities - Human–Computer Interface in Pervasive Environments - HCI Service and Interaction Migration - Context-Driven HCI Service Selection - Interaction Service Selection Overview - User Devices - Service-Oriented Middleware Support - User History and Preference - Context Manager - Local Service Matching - Global Combination - Effective Region - User Active Scope - Service Combination Selection Algorithm		
	PART A		
1	**Give** the requirements for HCI within a pervasive environment.	Understand	BTL2
2	**List** out the item types and denotations used in the TruckRace program.	Remember	BTL1
3	**List** the Interaction migration can be achieved at different levels.	Remember	BTL1
4	**Predict** the ontology-based service-matching methods.	Understand	BTL2
5	**Identify** the language descriptions for Web services.	Remember	BTL1
6	**What** is Web service matching?	Remember	BTL1
7	**Examine** how to address the issue of service selection.	Apply	BTL3
8	**Illustrate** good example of collaborative Web browsing.	Apply	BTL3
9	**Differentiate** two major types of context information.	Understand	BTL2

10	**Compare** Service property matching vs User preference matching.	Analyze	BTL4
11	**Define** human behavior modeling.	Remember	BTL1
12	**Give** the main obstacle to designing a framework for general application user interfaces.	Create	BTL6
13	**Explain** the general properties of audio and video services?	Analyze	BTL4
14	**Explain** how would you rate the levels to monitor the project?	Evaluate	BTL5
15	**Evaluate** the categorize APIs into several interaction service types.	Evaluate	BTL5
16	**List** the different issues of user interfaces.	Remember	BTL1
17	**Explain** the algorithm of service combination selection.	Analyze	BTL4
18	**Analyse** IRD parts**,**	Understand	BTL2
19	**Illustrate** the overall description of the interaction service selection.	Apply	BTL3
20	How to represent HCI effectiveness?	Create	BTL6
	PART B		
1	**Describe** in details about the various possible scenarios for multimodal and multiplatform HCI under a pervasive computing circumstance (13).	Remember	BTL1
2	**i) Discuss** why the concept of interaction migration has not been implemented in practical applications. (7) **ii)** How to solve the above problem. (6)	Understand	BTL2
3	**Propose** a structure for interaction service selection to achieve multimodal and multiplatform migration.(13)	Apply	BTL3
4	**Develop** a global combination selection algorithm.(13)	Analyze	BTL4
5	i) **Explain** the idea of interaction migration. (7) ii) Explain how it meet this demand in which HCI can be migrated across different platforms and modalities to provide better user experiences.(6)	Evaluate	BTL5
6	**i) Draw** the overall description of the selection process in our framework.(6) **ii) What** are the three main components comprise the interaction environment.(7)	Create	BTL6
7	**Examine** in detail about the two assumptions made in order to achieve better accuracy.(13)	Remember	BTL1
8	**Discuss** the two simple scenarios and illustrate the following requirements for HCI within a pervasive environment. (13)	Understand	BTL2
9	i) **Illustrate** the salient features of each interaction device that receives migration requests from the context manager.(7) ii) Explain the service matching procedure.(6)	Apply	BTL3
10	i) **What** is HCI migration request? (5) ii) **Illustrate** the Structure of service migration request in video call scenario(8)	Analyze	BTL4
11	i) Explain Semantic matching in detail. (5) ii) **Construct** the migration process. (8)	Remember	BTL1
12	**Summarize** and demonstrates the composition of an application .(13)	Understand	BTL2
13	**Draw and explain** the framework of HCI migration support environment. (13)	Analyze	BTL4

14	**Describe** the following in detail: i) Framework position between application and OS system. (8) ii) General compositions of applications (5)	Remember	BTL1
	PART C		
1	**Design** a framework using Web service technologies to support HCI migration in environments. (15)	Create	BTL6
2	**Give** examples of how to develop a service-coverage model and corresponding search algorithm. (15)	Evaluate	BTL5
3	Suppose a specific scenario, having video calls with a customer at a smart office, to **illustrate how** our context-aware service selection framework works to provide better user experiences. (15)	Create	BTL6
4	**Evaluate** the simulation results of our context-aware HCI service selection algorithm applying to the smart office scenario and compare our results. (15)	Evaluate	BTL5
	UNIT V PERVASIVE MOBILE TRANSACTIONS		
	Pervasive Mobile Transactions - Introduction to Pervasive Transactions - Pervasive Transaction Processing Framework - Context-Aware Pervasive Transaction Model - Context Model for Pervasive Transaction Processing - Dynamic Transaction Management - Context-Aware Transaction Coordination Mechanism - Coordination Algorithm for Pervasive Transactions - Participant Discovery - Formal Transaction Verification - Petri Net with Selective Transition.		
	PART A		
1	**Point out** the features of pervasive environments.	Analyze	BTL4
2	**Define** pervasive transaction**.**	Remember	BTL1
3	**Classify** MUD and MUDD.	Analyze	BTL4
4	**Draw** the scenario of pervasive transactions.	Create	BTL6
5	**Describe** different execution models in Pervasive Transaction Processing.	Understand	BTL2
6	**Analyze** a framework for evaluating pervasive systems with an example.(13)	Analyze	BTL4
7	**Develop** the stages of team formation model.	Create	BTL6
8	**Illustrate** the example for Context Details of Pervasive Transactions.	Apply	BTL3
9	Will you draw dynamic Transaction State Description.	Understand	BTL2
10	**Give** the three layers of networks in Pervasive Transaction Processing..	Understand	BTL2
11	**Define** two kinds of intradependencies.	Remember	BTL1
12	**Recommend** the formula for Calculating the minimal number of hops.	Evaluate	BTL5
13	**Illustrate** the states of global transactions.	Apply	BTL3
14	**What** you understand by Initiator and executors?	Remember	BTL1
15	**List** the context details of pervasive transactions.	Remember	BTL1
16	**Quote**: Selective transition.	Remember	BTL1
17	**Compare** Global commit vs Global abort.	Understand	BTL2
18	**Recommend** the steps how initiator coordinates a pervasive transaction.	Evaluate	BTL5
19	**Identify** the dimensions for pervasive transaction context.	Remember	BTL1

20	**How** coordinator and a participant execute the transaction coordination mechanism	Apply	BTL3
	PART B		
1	**Describe and how** pervasive transaction management has adaptively adjust execution policies during transaction processing.(13)	Remember	BTL1
2	i) Draw and **explain** the scenario of pervasive transactions.(7) ii) Different execution models of pervasive transaction. (6)	Understand	BTL2
3	**Demonstrate** the characteristic that distinguishes pervasive systems from traditional distributed environments. (13)	Apply	BTL3
4	Explain in detail about Pervasive Transaction Processing Framework?(13)	Analyze	BTL4
5	**Explain** and exhibit the following features of pervasive environments.(13)	Evaluate	BTL5
6	i) **List** the context details of pervasive transactions. (7) ii) **Explain** the Context aware model for pervasive transactions. (6)	Create	BTL6
7	**Discuss** and explain about the pervasive transaction processing framework. (13)	Remember	BTL1
8	i) **Discuss** the states of global transactions.(8) ii) Explain its three types.(5)	Understand	BTL2
9	Draw and **Illustrate** the conversion diagram of transactions. (13)	Apply	BTL3
10	**Explain** the different types of Context Details in pervasive transactions.(13)	Analyze	BTL4
11	**Describe** the Query and response messages for participant discovery.(13)	Remember	BTL1
12	**Describe** in detail i) Conditional activity.(7) ii) Selective transition.(6)	Understand	BTL2
13	**Analyze** and Illustrate the execution flow process of the pervasive transaction coordination.(13)	Analyze	BTL4
14	As a developer, **express** the characteristics Petri net of the coordination algorithm. (13)	Remember	BTL1
	PART C		
1	**Create** a model for the medical treatment reservation scenario. (15)	Evaluate	BTL5
2	**Construct** the reachability of the Petri net and then validate the correctness of the coordination algorithm by the reachable tree analysis technology of Petri nets.(15)	Evaluate	BTL5
3	**Model** the aforementioned coordination algorithm through Petri nets and then validate the algorithm's correctness using the Petri nets' reachable tree analysis technology.(15)	Create	BTL6
4	**Evaluates** the performance of the coordination algorithm through a simulation system.(15)	Create	BTL6