THIRD SEMESTER

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

RELATIONAL DATABASE MANAGEMENT SYSTEM

BMCI301

Review of DBMS:

Section – A

Basic DBMS terminology; Architecture of a DBMS: Data Independence - Physical and Logical Independence, Degree of Data Abstraction, Initial Study of the Database, Database Design, Implementation and Loading, Testing and Evaluation, Operation, Maintenance and Evaluation.

Conceptual Model:

Entity Relationship Model, Importance of ERD, Symbols (Entity: Types of Entities, week Entity, Composite Entity, Strong Entity, Attribute: Types of Attribute, Relationship: Type of relationship, Connectivity, Cardinality).

Section – B

Database Models and Normalization:

Comparison of Network, Hierarchical and Relational Models, Object Oriented Database, Object Relational Database, Comparison of OOD & ORD; Normalization and its various forms, De-Normalization, Functional Dependencies, Multi-valued Dependencies, Database Integrity: Domain, Entity, Referential Integrity Constraints.

Transaction Management and Concurrency Control:

Client/ Server Architecture and implementation issues, Transaction: Properties, Transaction Management with SQL, Concurrency; Concurrency Control: Locking Methods: (Lock Granularity, Lock Types, Two Phase Locking, Deadlocks), Time Stamping Method, Optimistic Method, Database Recovery Management.

Section – C

Distributed Databases:
Centralized Verses Decentralized Design; Distributed Database Management Systems (DDBMS): Advantage and Disadvantages; Characteristics, Distributed Database Structure, Components, Distributed Database Design, Homogeneous and Heterogeneous DBMS.

Levels of Data and Process Distribution:
SPSD (Single–Site Processing, Single-Site Data), MPSD (Multiple-Site Processing, Single Site Data), MPMD (Multiple –Site Processing, Multiple-Site Data), Distributed Database Transaction Features, Transaction Transparency, Client/ Server Vs DDBMS.

Section – D

Business Intelligence and Decision Support System:
The need for Data Analysis, Business Intelligence, Operational Data vs. Decision Support Data, DSS Database properties and importance, DSS Database Requirements.

OLAP and Database Administration:
Introduction to Online Analytical Processing (OLAP), OLAP Architecture Relational, Star Schemas, Database Security, Database administration tools, Developing a Data Administration Strategy.

DATA STRUCTURES

BSBC302

SECTION-A

Introduction to Data Structures: Basic concept of data, Problem analysis, algorithm complexity, Big O notation and time space trade off, Types of data structures: arrays records, pointers, stack, queue, trees, linked list packet, blocks, tracks, sector(in storage devices).
Searching and Sorting: Use of various data structures for searching and sorting, linear and binary search, bubble sort, insertion sort, selection sort.

SECTION-B

Stacks & Queues: Basics of stacks and queues, Recursion, Polish notation, circular Queues, priority Queues.

SECTION-C

Linked Lists: Single linked list, Circular linked list, Doubly linked list and Dynamic storage management, generalized list, Garbage Collection.

SECTION-D

Trees: Definition & Concepts, Basic trees, Binary tree representations, Binary tree traversals and application of trees.

Punjab Technical University

Bachelor in Mobile Computing & Internet Batch 2014 onwards

COMPUTER GRAPHICS

BSBC 602

SECTION-A

Introduction to Active and Passive Graphics, Applications of Computer Graphics.

Input devices: light pens, Graphic tablets, Joysticks, Trackball, Data Glove, Digitizers, Image scanner,
Graphs and Types of Graphs.

Video Display Devices-- Refresh Cathode Ray Tube, Raster Scan displays, Random Scan displays, Architecture of Raster and Random Scan Monitors, Color CRT-monitors and Color generating techniques
(Shadow Mask, Beam Penetration) , Direct View Storage Tube, Flat-Panel Displays; 3-D Viewing Devices, Raster Scan Systems, Random Scan Systems, Graphics monitors and workstations, Color Models
(RGB and CMY), Lookup Table.

SECTION-B

Process and need of Scan Conversion, Scan conversion algorithms for Line, Circle and Ellipse, effect of
scan conversion, Bresenham's algorithms for line and circle along with their derivations, Midpoint Circle
Algorithm, Area filling techniques, flood fill techniques, character generation.

SECTION-C

2-Dimensional Graphics: Cartesian and need of Homogeneous co-ordinate system, Geometric transformations (Translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text), Cohen Sutherland, Sutherland Hodgeman and Liang
Barsky algorithm for clipping.

SECTION-D

Introduction to 3-dimensional Graphics: Geometric Transformations (Translation, Scaling, Rotation,
Reflection, Shearing), Mathematics of Projections (parallel & perspective). Introduction to 3-D viewing
transformations and clipping.

Punjab Technical University
Bachelor in Mobile Computing & Internet Batch 2014 onwards

FUNDAMENTALS OF INTERNET TECHNOLOGY

BMCI302

SECTION-A

Introduction to Web Development:
Website, Webpage, Static Website, Dynamic Website, web, web 2.0 ,WWW, Web Server, Browser basics

Introduction to HTML/DHTML:
HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes, Headings, Paragraphs, Formatting, Links, Images, Tables, Lists, Forms, Frames, Tables creation & Storage, Lists, Images, Forms, CSS in DHTML, Implementation of WebPages using CSS.

SECTION-B

Introduction to XML:
XML Basics, XML Syntax and Editors, Elements, Attributes, Document Type Definitions (DTD), XML Schemas (XSD), XML Namespaces, XML Document Object Model, XSLT, Use of XSLT with XML.

Introduction to Ajax:
Ajax Basics, Use of Ajax in Website, Ajax browser support, Ajax technology, Ajax Security, Issues with Ajax.

SECTION-C

Introduction to JavaScript:
How & Where to put the JavaScript Code, JavaScript Statements, Comments, Variables, Operators, Control Statements, Loops, Popup Boxes, Functions.

The JavaScript Document Object Model :
Introduction (Instance, Hierarchy); The JavaScript Assisted Style Sheets DOM (JSSS DOM); Understanding Objects in HTML (Properties of HTML objects, Methods of HTML objects); Browser Objects (The Web Page HTML Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated); Handling (WEB PAGE) Events Using JavaScript (Named JavaScript Event handlers).Forms Used by a Web Site

SECTION-D

Purchasing a Domain Name & Web Space:
Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server.

Cookies : What are Cookies; Setting a Cookie.

COMPUTER NETWORKS

BSBC603

SECTION- A

Data communications concepts: Digital and analog transmissions-Modem, parallel and serial, synchronous and asynchronous, Modes of communication: Simplex, half duplex, full duplex, Concept of
multiplexing, De-multiplexing.

Types of Networks: LAN, MAN, WAN

Network Topologies: Bus, Star, Ring, Mesh, Tree, Hybrid

Communication Channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial
cables-base band, broadband, optical fiber transmission.

SECTION- B

Wireless Transmission: (Standards and Specification) Microwave transmission, Infrared transmission,
Laser transmission, Radio transmission and Satellite transmission and Blue Tooth, Frequency Spectrum.

Communication Switching Techniques: Circuit Switching, Message Switching, Packet Switching.

Network Reference Models: OSI Reference Model, TCP/IP Reference Model, Comparison of OSI andnTCP/IP Reference Models.

SECTION- C

Data Link Layer Design Issues: Services provided to the Network Layer, Framing, Error Control (error
detection and correction code), Flow Control, Data Link Layer in the Internet (SLIP, PPP).

Types of Multiplexing: FDM, TDM, CDMA

SECTION- D

MAC sub layer: CSMA/CD/CA, IEEE standards (IEEE802.3 Ethernet, Gigabit Ethernet, IEEE 802.4
Token Bus, IEEE 802.5 Token Ring)

The Network Layer: Design Issues, Routing Algorithms: Optimality Principle, Shortest Path Routing,
Congestion Control Policies, Concept of Internetworking.

SOFTWARE LAB-V(Computer Graphics)
BSBC 605

Implement the Following Algorithms using C/C++:-

Use of basic functions of graphic available in C++ like circle, putpixel, rectangle, arc, ellipse, floodfill,
setcolor etc.
Use of basic primitive functions to show some animations.
Line Drawing Algorithm like Direct method, DDA and Bresenham's line algorithms.
Draw a circle using polynomial, trigonometry method and Bresenham's Algorithm.
Draw an ellipse using Bresenham's Algorithm.
To move a character along circle.
To show 2D Clipping and Window

SOFTWARE LAB-VI (Internet Technology)

BMCI 303

Internal Assessment-60 Marks **External Assessment-40 Marks**

Implementation of all the practical Concepts related to theory concepts studied in FUNDAMENTALS OF INTERNET TECHNOLOGY [BSBC 304].

1. HTML Basics, HTML Elements (Tags), Structure of HTML Program
2. CSS in DHTML, Implementation of WebPages using CSS.
3. XML Basics, XML Syntax and Editors, Document Object Model, Use of XSLT with XML.
4. Ajax Basics, Ajax technology
5. Javascript Programs
6. Domain Name Server