Himachal Pradesh Board Informatics Practices Syllabus for Class 12

UNIT 1 : Business Computing

Unit-1:
Introduction to Open Source based software:

Terminology: OSS, FLOSS, GNU, FSF, OSI, W3C.

Definitions: Open Source Software, Freeware, Shareware, Proprietary software, Localisation, UNICODE

Software: Linux, Mozilla web browser, Apache server, MySQL, Postgres, Pango, Open Office, Tomcat, PHP, Python.

Websites :www.sourceforge.net, www.openrdf.org, www.opensource.org, www.linux.com, www.linuxindia.net, www.gnu.org.

1. General concepts, User interfaces (Front End), Underlying Database (Back End), Integration of User Interface and Database

2. More application areas of Databases : Inventory control, Financial Accounting, Pay-Accounting System, Invoicing Management System, Personal Management System / HRD System, Fees Management System, Result Analysis System, Admission Management System, Income Tax Management System

3. Advanced Program Development Methodology; System Development Life Cycle, Relational Database Concept, Relational Database, Management System, Data Models (Entity Relationship Model), Entity and Entity Set, Attributes (Single, Composite and Multi-Valued), Relationship (One-to-One One-to-Many and Many-to-Many), Entity Relationship Modeling Conventions, Communicating with as RDBMS using SQL, Relational Database Management System, SQL Statements, About programming language in SQL.

4. Data Dictionary, Data Warehousing, Data Mining, Meta Data; Object Modeling; Introduction to object oriented modeling using Unified Modeling Language (Concepts only).

5.
Client Server Computing: Concept of Client Server Computing.

Unit 2 : Programming: Visual Basic

Review of Class XI

Programming Fundamentals:

(i) Modules: Modules in Visual Basic-Form Modules, Standard Modules and Class Modules

(ii) Procedures: Procedures (General, Event, Function, Property).

Control Structures:

(i) Revision of Decision Structure – IF, IF-THEN-ELSE, Select Case

(ii) Revision of Looping Structure-Do While...Loop, Do...Loop While, for....Next, For Each....Next

(iii) Functions: Concept of Functions, Defining and Use of User Defined Function, function to perform calculations, Parametrized Functions

(iv) Library Functions (System Functions)

String Function: Space( ), Str( ), Right( ), Left( ), Mid( ), InStr( ), Len( ), Ltrim( ), Rtrim( ), Ucase( ), Lcase( ), String( )

Numeric Function: Sgn( ), Val( ), Int( ).

Time-Related Function: Now( ), Time( ), Minute( ), Month( )

Miscellaneous Function: MsgBox ( ), InputBox ( )

Types of forms: Single Document Interface (SDI) and Multiple Document Interface (MDI)

MDI Applications: Creating MDI from and Child form, Arranging Child Forms

Accessing database from ORACLE using ODBC or ADO or OLEDB; to connect with database.

Data Control: Accessing Data with the Data Control, Using Data-Aware Controls, Using Data Control Properties – Database Name, Exclusive, Options, Read Only, Record Source, Data Control Methods – Refresh, Update Controls, Update Record.

Bound Controls: Adding Bound Text and Bound Label Controls. Data- Bound-list Boxes, Grids, and Sub-Forms.

ADO (Active X Data Objects): Connection Object, Command Object, and Record Set Object, Special ADO Properties – Connection String (using single table), Command Text, Command Types, Cursor Locations, Cursor Types, Lock Types, Mode Types.

ADO Data Control: Simple Data linking using ADO Data Control Methods. ADO Data Control Events.

Unit 3 : Relational Database Management System

Review of RDBMS from Class XI

Database Fundamentals

Concept of Database Transaction, Committing a Transaction, Concept of "All or None" in a Transaction, Network Protocols Required (TCP/IP) for Data Communication, Stored Procedures, Concept of Database Fragmentation and Distribution Databases.

PL/SQL (Programming language in SQL)

Importance of Writing Procedures, Declaring Variables : About PL/SQL, PL/SQL Block Structure, Program Constructs, Use of Variables, Handling Variables in PL/SQL, Types of Variables, Declaration, Naming Rules, Assigning Values to Variables. Initialization and Keywords, Scalar Data types, Base Scalar Data Types, Scalar Variable Declaration, % TYPE attribute: for variable declaration, Declaring Boolean Variables, PL/SQL Record Structure, Referencing Non-PL/SQL variables, DBMS_OUTPUT.PUT_LINE.

Writing Executable Statements : PL/SQL Block Syntax and Guidelines, SQL functions in Code, SQL Functions in PL/SQL, PL/SQL Functions, Data type Conversion, Nested Blocks and Variable Scope, Operators in PL/SQL, Using Bind Variables, Programming Guidelines, Determining Variable Scope, SQL Statements in PL/SQL, Retrieving data in PL/SQL. Manipulating Data using PL/SQL, Inserting Data, Updating Data, Deleting Data, Naming Conventions, Commit and Rollback Statements, SQL Cursor, and Cursor Attributes.

Writing Control Structures: Controlling PL/SQL Flow of Execution, IF statements, IF-THEN-ELSE Statement Execution Flow, IF-THEN-ELSEIF Statement Execution Flow, Building Logical Conditions, Logic Tables, Boolean Conditions, Iterative Control; LOOP Statement, Basic Loop, FOR Loop, While Loop.

Creating Procedures: Overview of Procedures, Syntax for Creating Procedures, Developing Stored Procedures and its Advantages, Creating a Stored Procedure, Procedure Parameter Modes, Creating Procedures with Parameters, IN and OUT parameters and Usage, DEFAULT Option for Parameters, Removing Stored Procedures.

Writing Cursors: Introduction to Cursors (Implicit and Explicit), Explicit Cursor Functions, Controlling Explicit Cursors, Declaring, Opening and Closing the Cursor, Fetching data from the Cursor, Explicit Cursor Attributes (%ISOPEN, %NOTFOUND, %ROWCOUNT), controlling multiple fetches, Cursors and Records, Cursor FOR Loops, Cursor FOR Loops using Sub Queries.

Triggers: Types of Triggers: Row-Level Triggers, Statement Level Triggers, BEFORE and AFTER Triggers, INSTEAD of Triggers, Valid Trigger Type, Trigger Syntax, Combining Trigger Types, Enabling and Disabling Trigger, Replacing Trigger, Dropping a Trigger.

Development of Data Base Applications (Application Domain): Student database for School, Employee database for a company, Library Database for Library Student database management system for school, Employee database management system for a company, Library Database management system for Library, Railway Reservation System, Hotel Reservation, Inventory Control System,

Practical

Time Duration: 3 hours

Total Marks: (25 marks)

1. Hands On Experience: (13 marks)

A problem should be given covering the following features.

1. Start a Standard Exe Project and it should contain MDI form with Menu Bar and Tool Bar (with Images).

2. Table structure in the database for the application with Constraints (Primary Key, Foreign Key, Check, and Unique).

3. A New Form to place an ADO component on it, for accessing data in table Stored Procedure to perform transactions/conditional update.

4. Trigger (any).

5. Making executable files of project.

2. Records (4 marks)

1. Create an Application using Visual Basic for Students Information System Having a Student Table in Relational Database and a Student Data Form in Visual basic to enter data into the database.

2. Create an Application using Visual Basic for Criminals Information System Having a Criminal Table in Relational Database and a Criminals Data Entry Form in Visual Basic to enter data into the database. The Data entry form should contain form level and Field level checks using procedures.

3. Create an Application using Visual Basic for Nursing Home Automation System having Linked tables (for example : Patient, Employee, Bill) in Relational Database and a required Data Entry Forms in Visual Basic to enter data into the database. The Data entry form should contain form level and Field level checks using procedure. Use of Bound Controls and Sub-Forms are to be encouraged in this application.

4. Create a database handling application for Student Expert System. Following features are to be incorporated in the application:

(a) Create following linked tables of Student in the Relational Database.

(i) Student Master: containing general information about the student.

(ii) Student Detail : Table to store data having details such as Class, Section, Marks and other relevant information.

(iii) Student Fee Detail : Should contain details like Financial Year, Class, Fee, Fee Status (such as Paid and unpaid).

(iv) Accounts: General Accounts table to store fee collection details such as received from, date, cheque no. and other relevant information.

(b) The database should have Procedures to update data, Insert data and to perform other database transactions.

(c) Database triggers should also be defined wherever automatic data modification is required.

(d) Visual basic forms for data entry.

(e) Procedures in Visual Basic to perform Database Transactions and Commit changes made.

(f) Reporting tool to make the MIS reports, required to analyze data entry.

3. Project (4 marks)

The following case study is to be adopted for the development of project.

A book publishing company BR Publishing Group is in existence since 1950. They were untouched with latest technological inventions. They are still using a traditional approach of book keeping and accounts maintenance.

A company, Nova technology, introduced themselves as system integrator and developers who can change existing working system into the latest concept of paper less office. They wanted few details from the company about its working. The details are as under:

- Name of the company is BR Publishing Group.

- The company is having 20 employees. One Managing Director, Two Managers (Work manager and marketing Manager) and 17 employees who work as a team for book publishing.

- The company publishes book in different Indian languages and different topics.

- Every book involves an Author and its detail.

- The book is sold in the market at a variable discount options.

    Book Seller : 30%

    Schools: 20%

    Customer: 15%

- The company is maintaining information about Author and all its details such as Personal Information, Royalty etc.

- The company manages information about the book such as Book Name, Author, Quantity Sold, Quantity in Stock, etc.

- The company maintains Customer (Book Sellers) information, Books Sold, Subject, Language, and Amount Pending etc.

- Reports are required at different levels, such as Customer Listing, Book Listing, Language Wise Book Listing, Topic Wise Book Listing, Pending Amount Listing (Customer Wise, Book Wise), Author Royalty Detail, Bill Generation etc.

As a developer you are required to design the project and develop it as per customer needs (Developer can also visit a publishing company to collect customer details and live data). Suitable assumptions can be made during implementation. A proper normalized database is to be maintained in the RDBMS and the front end is to be developed using advanced interface controls. User-friendly interface is to be generated.

Note :— This is a sample case study. Similar type of cases can be developed on different application areas such as Library, Hospital, Transport Authority, Transporters, Wholesale Merchants, and Chemist Shops etc. The cases to be developed should preferably be obtained from live situations.

4. Viva Voce: Five questions from topics covered in the syllabus.

Reference Books:

- Mastering Visual Basic 6 – Petroutsos (BPB).

- Programming with Visual Basic 6 - Bay Ross (BPB).

- Visual Basic 6 Complete - Sybex (BPB).

- Successful Projects in Visual Basic – Christopher (BPB).

- Oracle 8 : The Complete Reference – George Koch, Kevin Loney (TMHP).

- Visual Basic Black Book (IDG).

- Programming in Visual Basic - McBride (BPB)

- Learn Oracle 8i - Ramalho (BPB).

- TEACH YOURSELF SQL / PL SQL USING ORACLE 8i & 9i with SQL

  J – BAYROSS (BPB).

- Visual Basic and ORACLE SSI Press.

- Oracle Programming with Visual Basic – Snowdon (BPB).

- Quan Book 'O' Level all Vol. – DOEACC (BPB).