

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM

COMPUTER TECHNOLOGY (66)

**SYLLABUS
(COURSE STRUCTURE-2010)**

FIFTH SEMESTER

6651 MICROPROCESSOR AND MICROCOMPUTER- I

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AIMS

- To be able to acquire the knowledge on microprocessor, microcomputer and computer language.
- To be able to develop the knowledge and skill on the architecture and assembly language programming of 8-bit Intel & Motorola μ p.
- To be able to acquire the knowledge and skill on memory and I/O interfacing.

SHORT DESCRIPTION

Operation of SAP-2, Architecture and addressing mode of Intel 8085 μ p; Instruction timing of Intel 8085 μ p; Assembly language programming of 8085 μ p; Memory and input /output interfacing of Intel 8085 μ p; Architecture and programming of MC6800.

DETAIL DESCRIPTION

Theory:

1 Understand the operation of SAP- 2 .

- 1.1 Define microprogramming.
- 1.2 Distinguish between Hardwired control and microprogramming for computer operation.
- 1.3 Describe the function of each block of SAP-2 computer.
- 1.4 Mention the type of instructions used in SAP-2(Memory reference instructions, Register instructions, JUMP and CALL instructions, Logic instructions and miscellaneous group instructions.)
- 1.5 Describe each type of SAP-2 instructions including their format and meaning.
- 1.6 Prepare source and Hand assemble program using each types of SAP-2 instructions for solving simple arithmetic, logic and delay problem.
- 1.7 Describe the addressing modes of SAP-2 instructions.
- 1.8 Describe the operation of the circuit diagram of SAP-2 for setting the Flags.
- 1.9 State the difference between SAP-1 and SAP-2 computer.

2 Understand the architecture of Intel 8085 microprocessor.

- 2.1 Define microprocessor and microcomputer.
- 2.2 Describe the evolution of microprocessor. (i.e. 4, 8,, 16 and 32 and 64 bit μ p).
- 2.3 Mention the important features of Intel 8085 microprocessor.
- 2.4 Describe the function of each block of Intel 8085 microprocessor.
- 2.5 Describe the bus organization of 8085 microprocessor.
- 2.6 Sketch the register architecture of 8085 microprocessor.
- 2.7 Describe the function of each register of 8085 microprocessor.
- 2.8 State the meaning of the signals of 8085 microprocessor.

3 Understand the instruction set and addressing mode of 8085-p.

- 3.1 Classify the instructions of 8085 microprocessor.
- 3.2 Mention the name of 8085 addressing modes.
- 3.3 Describe the 8085 addressing modes.
- 3.4 Define instruction set.
- 3.5 Describe the format and meaning of each instruction used in Intel 8085 microprocessor.

4 Understand the 8085 instruction timing and execution.

- 4.1 State the clock period and machine cycle of 8085.
- 4.2 Describe the basic system timing of 8085.
- 4.3 Describe the 8085-memory read write operation with timing diagram.

- 4.4 Describe the interrupt timing of 8085.
- 4.5 Describe the interrupt acknowledge machine cycle.
- 4.6 Describe the bus idle machine cycle.

5 Understand the programming concept of 8085~p.

- 5.1 Describe the programming process with flowchart.
- 5.2 State the meaning of assembler directives.
- 5.3 Describe the meaning of each field of assembly language program.
- 5.4 Describe the use of the assembler directives of 8085.
- 5.5 Write simple program using the 8085 instruction set for solving arithmetic, logic and delay problem.

6 Understand Intel 8085 input / output operation and interfacing.

- 6.1 Mention the basic input output techniques.
- 6.2 Describe the operation of 8085 programmed I/O, interrupt driven I/O, Direct Memory Access Controller (DMAC) and DMA.
- 6.3 Describe the I/O structure of a typical microcomputer.
- 6.4 Describe the function of coprocessors.
- 6.5 Describe the use of 8085 SID and SOD lines.

7 Understand memory and peripheral interfacing.

- 7.1 Describe the memory mapping techniques.
- 7.2 Sketch the diagram of memory chips with microprocessor to form a simple microcomputer system.
- 7.3 Describe the chip select scheme by decoding address lines.
- 7.4 Define support chips.
- 7.5 List the commonly used support chips (both dumb & smart).

8. Understand programmable peripheral devices.

- 8.1 Define programmable peripheral.
- 8.2 State the functions of PPI and PIC.
- 8.3 Describe the operation of PPI & PIC using block diagram .
- 8.4 Describe the control word format of PPI.
- 8.5 Configure the control word of the control register for simple I/O operations.
- 8.6 Write simple program for data transferring to and from microprocessor using PPI.

9. Understand the general aspects of Intel family of ~P.

- 9.1 Describe the evolution based on performance and device complexity of the Intel μ P architecture.
- 9.2 Mention the difference between a multi-chip and single chip microcomputer.
- 9.3 State the embedded microcontrollers and reprogrammable microprocessor.
- 9.4 Explain the basic architecture of the Intel family of μ P.
- 9.5 Mention the comparison of address & data bus and the clock speeds for the Intel family members.
- 9.6 Describe the memory map of the Intel family members and personal computer system.
- 9.7 Explain the internal register array (programming model) of all versions of the Intel family members.

10 Understand the architecture of MC 6800 microprocessor.

- 10.1 Mention the important features of MC 6800.
- 10.2 Describe the internal architecture of MC 6800.
- 10.3 Describe the pins and signals of MC 6800.
- 10.4 Describe the instruction set of MC 6800.
- 10.5 Explain the read and write timing diagram of MC 6800.

- 10.6 Mention the addressing mode of MC 6800.
- 10.7 Compare Intel 8085 with MC 6800.
- 10.8 Write simple program using the instruction set of MC 6800.

Practical:

1. Perform the task to develop and execute an assembly language program for solving arithmetic problems(Addition/Subtraction) using SAP/i8085 / MC 6800 μ p trainer.
2. Perform the task to develop and execute an assembly language program to compute 1's or 2's complement of binary number using SAP/i8085 / MC 6800 μ p trainer.
3. Perform the task to develop and execute an assembly language program for solving arithmetic problems(Multiplication / Division) using SAP/i8085 / MC 6800 μ p trainer
4. Perform the task to develop and execute an assembly language program for solving logic operation using SAP/i8085 / MC 6800 μ p trainer.
5. Perform the task to develop and execute an assembly language program/ Subroutine to produce time delays of different durations using SAP/i8085 / MC 6800 μ p trainer.
6. Perform the task to develop and execute an assembly language program that inputs a byte of data from a port using handshaking and store the byte into a register in a SAP/i8085 / MC 6800 μ p trainer.
7. Perform the task to develop and execute an assembly language program that inputs an 8 bit character in a serial data stream and store it in a specified memory location using a SAP/i8085 / MC 6800 μ p trainer
8. Perform the task to develop and execute assembly language programs that transfer data between I/O and memory with an available I/O techniques. using a SAP/i8085 / MC6800 μ p trainer.
9. Perform the task to develop and execute assembly language programs that implement the branching and looping structures using a SAP/i8085 / MC 6800 μ p trainer.

REFERENCE BOOKS

1. Digital Computer Electronics
-Malvino- Brown
2. Microprocessor and Microcomputer Based System Design
- Mohamed Rafiquzzaman.
3. Microprocessor Architecture, Programming and Applications with 8085
- Ramesh S. Gaonkar.

AIMS

- To able to familiarize with the fundamentals of computer architecture
- To able to understand the encoding procedure of instruction for computing.
- To able to develop knowledge and skill on designing Adder,subtractor, multiplier, divisor and ALU.
- To be able to develop knowledge and skill on the execution unit, control unit, memory organization and I/O systems.
- To be able to familiarize with parallel. and multi processing system.
- * To be able to familiarize with Dual Core and Core I processor.

SHORT DESCRIPTION

Computer architecture fundamentals; Computer instruction design; Arithmetic Logic and Control unit; Memory organization; Input/output operation and Parallel processing. Feature of Dual Core and Core I processor.

DETAIL DESCRIPTION

Theory:

- 1 Understand the basics of computer architecture.
 - 1.1 State the meaning of stored program computer.
 - 1.2 Distinguish between stored program computer and nonstored program
 - 1.3 Review the organization of SAP-1 as an stored program computer.
 - 1.4 State the operation of micro and macro instructions used in SAP-1 Computer.
 - 1.5 State the block diagram of Von Neumann and Harvard Architecture Computer System.
 - 1.6 Mention the basic features of Von Neumann and Harvard Architecture

- 2 Understand the operation of register and type of contemporary computers.
 - 2.1 Define General purpose register and dedicated register
 - 2.2 Describe the operation of a four bit General Purpose register/Universal shift register.
 - 2.3 State the types of contemporary computer (General register machines, accumulator based machines & stack machines)
 - 2.4 Describe the organization of each types of contemporary computer.
 - 2.5 State the difference of general register machines, accumulator based machine and stack machines.

- 3 Understand the instruction design process of a computer .
 - 3.1 State the types of instruction formats depending on the number of address with example.
 - 3.2 Mention the characteristics of good instructions.
 - 3.3 State the important points to be considered for designing instruction format.
 - 3.4 State the meaning of op-code encoding & decoding

- 3.5 Mention the types of op-code encoding techniques.
- 3.6 Describe block code op-code encoding technique
- 3.7 Mention the merits and demerits of the block code encoding technique.
- 3.8 Describe the expanding op-code encoding techniques.
- 3.9 Describe the Huffman op-code encoding techniques
- 3.10 Prove that Huffman op-code encoding scheme archives optimal result by keeping the redundancy to a minimum value.

4. Understand the design and implementation of arithmetic and logic units.

- 4.1 Describe the implementation of a 4 bit Ripple carry adder.
- 4.2 State the limitation of CPA
- 4.3 State the meaning of Carry generate functions and Carry propagate functions.
- 4.4 Describe the operation of a of 4-stage carry look-ahead circuit.
- 4.5 Prove that 16 bit CLA is faster than 16 bit CPA
- 4.6 State the steps to design a four function ALU.
- 4.7 Describe the organization of a of 4 bit 2 function arithmetic unit..
- 4.8 Describe the organization of a of 4 bit 2 function logic unit
- 4.9 Show the combining technique of arithmetic and logic unit.

5 Understand the operation of multiplier and divisor.

- 5.1 Define non-additive and additive multiplier.
- 5.2 Describe the algorithm to multiply two 4-bit unsigned numbers
- 5.3 Describe the operation of a 4×4 unsigned array multiplier.
- 5.4 Describe the operation of a 2's complement sequential Booth's multiplier using flowchart.
- 5.5 Describe the operation of a sequential n bit binary divisor.
- 5.6 State the algorithm of restoring & non restoring division process of two integer numbers

6 Understand the basic concepts of control unit.

- 6.1 . State the purposes of Control Unit.
- 6.2 Describe the Hardware implementation of data transfer operations of a register with enable input and conditional control signals such as
 - (a) $C_o : A \oplus B$ Where $C_o = G \oplus D[0]$ and $G = A \oplus B$
 - (b) if $X=0$ and $t=1$, then $C_o : A \oplus B$ else $A \oplus D$
- 6.3 State the meaning of hardware approach and microprogrammed approach to design a control unit.
- 6.4 State the steps of hardware approach for designing a control unit..
- 6.5 Describe the basic structure of a microprogrammed control unit and microinstruction format.

7 Understand the principle of memory organization .

- 7.1 Describe the memory hierarchy of a microcomputer system.
- 7.2 Mention the design goals of a memory system.
- 7.3 Describe the general features of centralized and distributed memory organization.
- 7.4 State the formula to calculate the number of RAM chips requirements to design higher capacity RAM.

- 7.5 Describe the design procedure of 1K×8 RAM and 4K×4 RAM using 1K×4 RAM chips.
- 7.6 Describe the conceptual organization of the bank switching and address extension scheme.
- 7.7 Describe the memory organization of a cache memory in a computer system
- 7.8 Calculate the average access time and efficiency of a system that employs a cache memory.

8 Understand the input / output techniques.

- 8.1 List the methods of data transferring techniques between computer and the I/O devices.
- 8.2 Describe the programmed I/O.
- 8.3 Distinguish between standard I/O vs. memory mapped I/O.
- 8.4 Describe the basic concepts of interrupt driven I/O.
- 8.5 Describe the principal of direct memory access(DMA) system.

9 Understand the concept of array and pipeline processing system .

- 9.1 Define parallel processing.
- 9.2 State the parallelism facilities in conventional computers.
- 9.3 Classify Computer architecture using Flynn's method with example
- 9.4 Describe the organization of an array processor.
- 9.5 Describe the basic concepts of pipe line processing.
- 9.6 Describe over lapped execution of instruction pipeline.
- 9.7 Describe the concept of arithmetic pipeline.

10 Understand the multiprocessor system.

- 10.1 Define multiprocessing and multitasking.
- 10.2 Mention the characteristics of a multiprocessor system
- 10.3 State the advantages of multiprocessor system.
- 10.4 Describe the conceptual view of a multiprocessor organization.
- 10.5 Describe the organization of crossbar multiprocessor system.

11. Understand the operation of Multi Core processor

- 11.1 State the meaning of Dual core and Core I processor.
- 11.2 Define cheapest
- 11.3 State the features of North bridge, South bridge and hub regarding cheapest.
- 11.4 State features of ISA, PCI-X, PCI-Xpress, AGP and Processor Bus (no pin description)
- 11.5 State the difference between PCI and PCI Express
- 11.6 State the concept of extended memory, Expanded memory (No memory map); Concept of cache memory : Internal cache, External cache (L1, L2, L3 cache);
- 11.7 State the features of SDRAM, DDR, DDR2, DDR3
- 11.8 Describe the general features of RISC and CISC .
- 11.9 Describe the concept of Core-I processing using block diagram.
- 11.10 State the basic technical feature of Core I7 processor.

Practical:

1. Perform the task to develop a 4 bit parallel in serial out shift register using D type Flip Flop
2. Perform the task to develop a basic cell to design a general purpose register using a 4 input multiplexer and a D type Flip Flop.
3. Perform the task to make a 4 bit General purpose register using the basic cell.
4. Perform the task to Implement an 8 bit adder using 4 bit adder as a building blocks.
5. Perform the task to Design and develop an 8 bit adder using 4-bit CLA.
6. Perform the task to Design and develop a 4-bit adder/subtractor circuit.
7. Perform the task to Design and develop a two function logic unit.
8. Perform the task to Design and develop a four function ALU.
9. Perform the task to transfer 8 bit data to/from an I/O device using programmed interfaces through the I/O port/ports.
10. Perform the task to Implement a 4×4 array multiplier using full adders.
11. Perform the task to Implement a $1k \times 8$ RAM chip using $1K \times 4$ RAM.
12. Perform the task to familiar the parts and components of a Dual core/Core-I processor based microcomputer.

REFERENCE BOOKS

1. Modern Computer Architecture by Mohamed Rafiqzaman.
2. Computer Architecture and Organization by John P Hayes

AIMS

To provides the students with an opportunity to acquire knowledge, skill & attitude in the field of visual programming with an special emphasis on:

- visual program environment
- design and development of visual programs
- modification of codes generated by Visual Basic Programs.

SHORT DESCRIPTION

Review the concepts of OOP; Visual Basic Fundamentals; Visual Basic variables , constants , operators and expressions; Visual Basic codes; Program flow & control statements; Visual Basic form and design; MDI application; Functionality of form with controls; Visual Basic debugging; Objects & classes in VBA; Printer object; Visual Basic data access & control methods.

DETAIL DESCRIPTION

Theory:

1 Review the concepts of OOP.

- 1.1 State object oriented programming and procedure oriented programming.
- 1.2 Describe object,class & attributes with example.
- 1.3 Describe encapsulation,inheritance,polymorphism,data abstraction & message passing in oop.

2 Understand the concepts of Visual Basic.

- 2.1 Define visual programming.
- 2.2 Distinguish between the character based systems and graphical user interface.
- 2.3 Describe the features of visual programming.
- 2.4 Describe the advantage and disadvantage of visual programming.
- 2.5 Mention the steps to prepare Visual Basic programs.
- 2.6 Describe Visual Interface components.

3 Understand Visual Basic Variables , Constants and Keywords.

- 3.1 Mention different variables and constants.
- 3.2 Mention the data types with important aspects in Visual Basic.
- 3.3 Mention the method of declaring variable with syntax in Visual Basic.
- 3.4 Mention the rules for naming variables in Visual Basic.
- 3.5 Describe the scope and life time of variables in Visual Basic.
- 3.6 Describe the syntax of fixed size and variable size array in Visual Basic.
- 3.7 State the meaning of special values like Null, Empty, Error, etc, of variant variables.
- 3.8 Describe the concept of passing variables to procedures.

- 3.9 Describe the importance of user defined data types.
- 3.10 Describe visual basic keywords.

4 Understand Visual Basic Operators and Expressions.

- 4.1 Define operators.
- 4.2 Describe the arithmetic, comparison, logical, assignment, concatenation , Mod,IMP and EQV operators.
- 4.3 State Expressions.
- 4.4 Write arithmetic expression & its implementation in VB.
- 4.5 Describe the precedence of arithmetic operators.
- 4.6 Mention operator precedence and associativity.

5 Understand VB Projects, codes, program flow and control statements.

- 5.1 Define projects.
- 5.2 Mention the project type with major features in Visual Basic.
- 5.3 State the file types with major features of Visual Basic project.
- 5.4 Mention the purpose of using general page, make page and compile page.
- 5.5 Describe modules and procedures in Visual Basic.
- 5.6 Mention the general rules for procedures of Visual Basic.
- 5.7 Describe the important aspects of each components of Visual Basic subroutines & functions.
- 5.8 Describe the important parts of Visual Basic code window/editor.
- 5.9 Describe the structure and format of program flow and control Statements

6 Understand Visual Basic form design.

- 6.1 Define form and application window.
- 6.2 List the most common properties with important features of Visual Basic form.
- 6.3 List the methods with important features in Visual Basic.
- 6.4 Define form events.
- 6.5 Describe form maintenance and form operation events.
- 6.6 Describe *form mouse* and *form key board* events.
- 6.7 Describe the important aspects of built-in-dialog boxes.

7 Understand MDI application.

- 7.1 Define MDI parent and MDI child form.
- 7.2 Mention the behavior of MDI child form.
- 7.3 Define Menu and Popup menus.
- 7.4 List the menu item property and their functions.

8 Understand the functionality of form with controls.

- 8.1 List the controls in Visual Basic form.
- 8.2 State the functions and name prefixes of Visual Basic controls.
- 8.3 Describe the unique properties, methods and events of common controls.
- 8.4 State the meaning of OLE container control.
- 8.5 State array and their classification.
- 8.6 Describe one and multidimensional arrays.

- 8.7 Define control array.
- 8.8 Mention the benefits of using control arrays.
- 8.9 State the meaning of control focus.

9 Understand the Visual Basic debugging.

- 9.1 Describe the errors of visual basic application (VBA)
- 9.2 List the important aspects of syntax, logical and runtime errors.
- 9.3 Mention the important point for avoiding errors.
- 9.4 Describe the debugging techniques.

10 Understand objects and classes in VBA.

- 10.1 List the visible and invisible objects in VBA.
- 10.2 Mention the advantages of using objects in Visual Basic.
- 10.3 State the principle of component object model (COM).
- 10.4 Mention the syntax of statements of using objects in VBA.
- 10.5 List the properties and methods of a typical class module.
- 10.6 Describe the property procedure in VBA.
- 10.7 Define collections.
- 10.8 State the operations supported by collections in VBA.

11 Understand the Printer Object.

- 11.1 Mention the print routine variables with their meaning.
- 11.2 Mention a sample print routine code.
- 11.3 Describe the printer objects properties.
- 11.4 Mention the code to search and display printer information.
- 11.5 Describe the important features and tools of crystal reports.

12 Understand Visual Basic data access and control methods.

- 12.1 Describe the formats encountered in text files.
- 12.2 Describe the syntax for reading text files.
- 12.3 Describe the Visual Basic file handling commands.
- 12.4 Describe the data control and its associated properties & methods.

Practical:

1 Demonstrate with the overall layout of the Visual Basic environment and development tools.

- 1.1 Invoke to the Visual Basic software.
- 1.2 Identify the components of the user interface.
- 1.3 Navigate each of the development tools.
- 1.4 Acquaint the integrated development environment of the package.
- 1.5 Write a report.

2 Perform the development of simple new application using Visual Basic which contain at least two controls such as textbox, command button, combo box etc.

- 2.1 Invoke to the Visual Basic.
- 2.2 Design the interface.

- 2.3 Write the code.
 - 2.4 Save the project.
 - 2.5 Run the application.
 - 2.6 Make and run an executable (.exe) files.
3. Write a VB program to add any two arbitrary numbers.
 4. Write a program to calculate the area of a triangle.
 5. Write a program to calculate the sum of the following series:
 - 5.1 $1+2+3+ \dots + N$
 - 5.2 $2+4+6+\dots+N$
 - 5.3 $1+3+5+\dots+N$
 - 5.4 $2^2+4^2+6^2+\dots+N^2$
 6. Write a program to find the roots of a quadratic equation.
 7. Write a program to calculate factorial of any integer using function.
 8. Write a program to find the prime number of any integer number N.
 9. Write a program to select and print the largest of the three numbers .
 10. Write a program to sort numbers in ascending or descending order using array.
 11. Write a program to convert the given temperature in fahrenheit to celcius and vice versa.
 12. Write a program to print odd or even numbers from 1 to 100.
 13. Write a program to find the Fibonacci series.
 14. Write a program to design & development of a Visual Basic Interface for displaying the grade of students using if...then...else statement.
 15. Write a program to design & development of a Visual Basic Interface to build a math calculator which will be able to perform addition, subtraction, multiplication and division.
 16. Create an database application with the data control using data combo, data list control, data grid, ADO, DAO data control and manipulate data.
 17. Create a Project for responding to keyboard and mouse Events.
 18. Create report using data report of VB with page setup.
 18. Create report using third party report designer such as crystal report.

REFERENCE BOOK

1. Visual Basic 6.0 by Md. Masud Reza
2. Visual Basic 6.0 by Mahbubur Rahman
3. Visual Basic 6.0 by Kamruzzaman Niton

AIMS

- To be able to acquire the knowledge and skill in the database system concept.
- To be able to familiarize with data models in database systems.
- To be able to acquire the knowledge and skill in the Relational databases
- To be able to acquire the knowledge and skill in the Integrity & security.
- To be able to acquire the knowledge and skill in the Data storage, Transactions & concurrency control and Database system architecture.

SHORT DESCRIPTION

Database system concept; Data models; Relational databases, Integrity & security, Data storage, Transactions & concurrency control and Database system architecture.

DETAIL DESCRIPTION**Theory:**

- 1. Understand the basic concept of database system.**
 - 1.1 Define database management system.
 - 1.2 Explain the purpose of database management system.
 - 1.3 Mention the different between conventional file system and database management system.
 - 1.4 Mention the advantages & disadvantages of database management system.
 - 1.5 Define data abstraction, instances and schemas.
 - 1.6 Mention the types of schema.
- 2. Understand the concepts of database languages, users, manager and administrator.**
 - 2.1 Describe the database languages with examples.
 - 2.2 Describe the basic operation of DDL, DML and data dictionary.
 - 2.3 Describe the different types of database system users.
 - 2.4 Example the different tasks of database manager.
 - 2.5 Describe the functions of a database administrator.
 - 2.6 Describe the functional components of a database system.
- 3. Understand the data models.**
 - 3.1 Define the entity and entity set.
 - 3.2 Define the data model.
 - 3.3 Mention the meaning of E-R diagram symbol.
 - 3.4 Describe the E-R diagram for different mapping constrains.
 - 3.5 State different types of attribute uses in E-R diagram.
 - 3.6 State the techniques to convert E-R diagram to table.
 - 3.7 Describe the different types of data models with examples.
 - 3.8 Describe the constraints in entity-relationship (mapping, cardinalities and existences) with diagrams.
 - 3.9 Define key in DBMS.

- 3.10 State the meaning of different types of keys in DBMS (super key, candidate key, primary key and foreign key).
- 3.11 Distinguish between strong and weak entity sets.
- 3.12 Describe the schema diagram with example.

4. Understand the relational database.

Query language.

- 4.1 Define query language.
- 4.2 Mention the different among SQL, QBE and Datalog.
- 4.3 Describe the fundamental operations of relational algebra(**select, project, union, set difference, cartesian product, rename, set intersection, natural joint, division and assignment**).

5. Understand the SQL.

- 5.1 Mention the several parts of SQL.
- 5.2 Explain three clauses of SQL expression (**select, from, and where**).
- 5.3 Describe the uses of SQL set operations (**union, intersect, and except**).
- 5.4 Describe the uses of SQL aggregate functions (**avg, min, max, sum and count**).
- 5.5 Describe the technique to add, remove and change information with SQL (**delete, insert, and update**).

6. Understand the integrity and security.

- 6.1 Define integrity constraint.
- 6.2 Describe the referential integrity in SQL.
- 6.3 Describe the assertions in DBMS.
- 6.4 Define the triggers and need for triggers in DBMS.
- 6.5 Define the security in DBMS.
- 6.6 Describe the protection of database.
- 6.7 Define encryption and authentication in database.
- 6.8 Mention the technique of encryption.

7. Understand the relational database design.

- 7.1 Define the normalization.
- 7.2 Mention the need for normalization.
- 7.3 Describe the term redundancy in DBMS.
- 7.4 Explain the three stages/rules of normalization in database management system (1NF, 2NF, and 3NF)
- 7.5 Describe the overall database design process.

8. Understand the data-storage media.

- 8.1 List the physical storage media.
- 8.2 Describe the storage-device hierarchy used for database storage.
- 8.3 Define the RAID.
- 8.4 Describe the different levels of RAID.
- 8.5 Describe the choice of RAID levels.

9. Understand the Transactions and concurrency controls.

- 9.1 Define transaction and concurrent execution in DBMS.

- 9.2 Mention the properties of the transaction.
- 9.3 Explain the transaction state with diagram.
- 9.4 Mention the reasons for allowing concurrency.

10. Understand the database system architecture.

- 10.1 Define centralized, parallel and distributed database system.
- 10.2 Explain the homogeneous and heterogeneous databases.
- 10.3 Explain the structure of server (Centralized and client server), parallel and distributed database system architecture.
- 10.4 Describe the advantages and disadvantages of server, parallel and distributed database system architecture.

PRACTICAL:

1. Arrange the necessary hardware and operating system for installing MS-Access, SQL server or Oracle.
2. Create a new database for the result process application using MS-Access, SQL server or Oracle.
3. Create tables such as Student Information, Department Information, Subject Information, Year information and Mark Information (including):
 - I. Create a new table
 - II. Define primary key
 - III. Save the table structure
 - IV. Edit a table structure
 - V. Insert a field
 - VI. Delete a field
 - VII. Move a field
 - VIII. Change or remove a key field
4. Create relationship among tables.
5. Sort the *Mark Information* table lookup fields.
6. Create data entry form for entering data in Student Information, Department Information, Subject Information, Year Information and Mark Information tables
7. Create a query involving only one table.
8. Query linked tables and create a form from a query.
9. Create a total query to find the GPA of each student of a particular year.
10. Apply Normalization (1NF, 2NF and 3NF) on result process database.
11. Use Auto Report to create a table reports of result process.
12. Use the report wizard to create a grade sheet /mark sheet/transcript.
13. Use the report wizard to create a merit list.
14. Use the report wizard to create a tabulation sheet.
15. Perform the task to install Oracle Database Language and Invoking SQL Plus.
16. Perform the task to manipulate data in data base management system (**select, project, union, set difference, cartesian product, rename, set intersection, natural joint, division and assignment**).
17. Perform the task to view, delete and update data into a table (**delete, insert, and update**).
18. Perform the task to modify the structure of a table.
19. Perform the task to Compute on Table Data including 'DUAL' and SYSDATE
20. Perform the task to work with Oracle functions and different Type of constraints.
21. Perform the task to work for grouping data from tables and manipulate dates in SQL
22. Perform the task to work with Sub queries and JOINS in SQL
23. Perform the task to work with Indexes in SQL

24. Perform the task to work with View, sequences and Security in SQL including user and administrative level.
25. Perform the task to work with oracle transaction, process and Parameterized cursor in PL/SQL
26. Perform the task to work with Concurrency Control (Implicit and explicit lock) and error handling in PL/SQL
27. Perform the task to work with Database object, Oracle package and database trigger in PL/SQL
28. Given basic salary, increment and date of joining of 25 employees. Create a database to perform an annual budget from July to June.

REFERENCE BOOK

1. Database System Concepts – Henry F. Korth.
2. Successful projects in ACCESS - P.M Heathcote
3. SQL, PL/SQL
The programming language of ORACLE- By-IVAN BAYROSS
4. Introduction To Oracle 10g SQL Volume-1
5. Introduction To Oracle 10g SQL Volume-2
6. Introduction To Oracle 10g PL/SQL Volume-1
7. Introduction To Oracle 10g PL/SQL Volume-2

References Web Site:-

www.java2s.com/Tutorial/Oracle/CatalogOracle.htm
www.docs.oracle.com

AIMS

- To be able to develop Knowledge, skill and attitude to design & create web page.
- To be able to apply the principles of website design,
- To be able to browse and use web sites
- To be able to link web pages and multimedia objects to the internet environment

SHORT DESCRIPTION

Design and development of web pages using XHTML/XML/CSS and Graphics software; Physical and logical character effects in XHTML/XML pages; Use of ordered and unordered list, table, forms, Radio button, Submit button and checkbox in web pages; Use of Validation check., Managing document spacing, linking image, sound and video to a page or other pages and multimedia objects and use of cascading style sheet in web page.

DETAIL DESCRIPTION**WEB BASIC**

1 Perform the task to understand the principles of website design.

1.1 Show skill to define web, web site and web page

1.2 Show skill to state the importance of information presentation.

1.3 Show skill to state the importance of an web site.

1.4 Show skill to State the principle of website design.

1.5 Navigate to an well organized existing web site and list the Common tab of the Home page.

2. Perform the task to familiar with the browsers and URLs.

2.1 List the web browsers to access the web.

2.2 Access to a popular web site using a web browser.

2.3 Move back and forth among web sites using more than one browser

2.4 Use URL to change the default home page.

2.5 Select a link to load the web page or file associated with the link.

2.6 Display the web site of a company/university or any other organization.

3 Perform the task to create a simple HTML text page.

3.1 Plan the architecture of the page to be display.

3.2 Select a favorite text editor.

3.3 Create a new file for the page.

3.4 Select a sample text statement for the page.

3.5 Type the document using different type of tags (HTML tag, HEAD tag and body tag.

3.6 Type the comment tag followed by a sample comment.

3.7 End the comment using appropriate sign character.

3.8 Use multiline comment in the document.

3.9 Save the HTML document.

3.10 Test the sample comments using an appropriate browser

4 Perform the task to create a simple HTML/ XHTML/ XML documents with paragraph and header elements.

4.1 Select the directories to develop a HTML/ XHTML/XML document.

4.2 Open a file in a text editor.

4.3 Type comments with appropriate Tag format

4.4 Use <HTML>/<XHTML>/<XML> start tag.

4.5 Include <Head> tag.

4.6 Use Title of the page using appropriate <TITLE> Tag.

4.7 Close </Head> tag.

4.8 Use <BODY> tag including paragraph and heading(H1 to H6)tags.

4.9 Use </BODY> and </HTML>/</XHTML>/</XML> End Tag.

4.10 Save the file with appropriate file extension.

4.11 View the page using available browser.

5 Perform the task to add physical and logical character effects in XHTML/XML page.

5.1 Include different type of attributes inside the body tag.

5.2 Use bold, italic and fixed width fonts.

5.3 Change font size and background & font color.

5.4 Underline text.

5.5 Specify strikethrough formatting.

5.6 Include superscripts and subscripts.

5.7 Use heading style.

5.8 Place emphasis and strong emphasis.

5.9 Use horizontal ruling line in the page

5.10 Specify a citation.

5.11 Emphasize a defined term.

5.12 Write a report.

6 Perform the task to create unodered and ordered list in web page.

- 6.1 Create a number list.
 - 6.2 Specify the style and sequence of number.
 - 6.3 Create a bulleted list.
 - 6.4 Modify the appearance of bullets.
 - 6.5 Create unmarked list, menu list, directory list and glossary list using appropriate tag and attribute.
 - 6.6 Test the document using an appropriate browser
- 7 Perform the task to maintain proper spacing in web page.**
- 7.1 Add horizontal rule(line) to an HTML document.
 - 7.2 Align text on a line using tables.
 - 7.3 Center the text on a page.
 - 7.4 Manage vertical space.
 - 7.5 Stop a browser from breaking a line at a critical point.
 - 7.6 Include preformatted text in the web page.
 - 7.7 Insert a block quotation.
 - 7.8 Create columnar text to span a table.
 - 7.9 Make space to the home pages.
 - 7.10 Test the web page by loading it into a browser.
- 8 Perform the task to create text hyperlinks**
- 8.1 Open the text editor to write source code of the web pages
 - 8.2 Use Title of the page using appropriate <TITLE> Tag
 - 8.3 Use the tag
 - 8.4 Specify the locations of the linked recourse using Appropriate anchor element(a) and attribute
 - 8.5 Test the web page by loading the page using a browser.
- 9 Perform the task to use and link of image as the background for the Web page.**
- 9.1 Locate or create a background image.
 - 9.2 List the popular image formats for use as webpage background.
 - 9.3 Open the web page in a text editor.
 - 9.4 Locate the opening tag of the body element for the page.
 - 9.5 Specify the location of the image file using img element and appropriate attributes.
 - 9.6 Specify the width and height of the image.
 - 9.7 Type the URL of the image as a background of the web page after the equal sign.
 - 9.8 Save the web page and Test the web page by loading it into a browser
- 10 Perform the task to establish the links to a web page.**
- 10.1 Identify various parts of URL.

- 10.2 Create relative URL.**
- 10.3 Add a base for relative URLs within the body of a document.**
- 10.4 Specify the relationship between a page and other resources.**
- 10.5 Create a link to a local page.**
- 10.6 Create a link to other pages.**
- 10.7 Send data to an http server via a URL.**
- 10.8 Create a link to a specific part of a page.**
- 10.9 Create a link to an FTP/Gopher/Telnet/WAIS Usenet Newsgroup.**
- 10.10 Create a link to electronic mail**

11 Perform the task to apply math and tables effectively in a web page.

- 11.1 Create a table in a web page.**
- 11.2 Place a caption in a table.**
- 11.3 Insert a table heading.**
- 11.4 Put data into cells or table element.**
- 11.5 Insert a blank cell into a table.**
- 11.6 Create a new row of data.**
- 11.7 Specify the width of a table relative to the browser window.**
- 11.8 Specify the distance between cells.**
- 11.9 Set the distance from the cell edge to the cell data.**
- 11.10 Put the table in the home page.**

12 Perform the task to create forms into a web page.

- 12.1 Open a text editor to create html pre tag and forms.**
- 12.2 Type the heading of the form using appropriate tag.**
- 12.3 Type an instruction for the user using paragraph tag.**
- 12.4 Specify the form method and action attributes.**
- 12.5 Specify the field name of the form using appropriate label tag.**
- 12.6 Specify the input type,size and length of the text box using appropriate attributes.**
- 12.7 Specify the input type and value to create Banner and button**
- 12.8 Use text area, checkbox, select and option tag element in a form of web page.**
- 12.9 Save the form documents with appropriate file name and Extension.**
- 12.10 Test the web page by loading it into a browser.**
- 12.11 Use html iframe/object/embed in the page.**
- 12.12 Use marquee tag in a xhtml page.**

13 Perform the task to create and use image map, metaelement, frameset element and nested framesets.

- 13.1 Open a text editor to create forms.**
- 13.2 Type the heading of the image map using appropriate tag.**
- 13.3 Designate areas of an image using map and area elements and appropriate attributes.**
- 13.4 Create a meta element and vector image**
- 13.5 Use text color and effect.**
- 13.6 Use frameset elements and attributes to allow the browser to display more than one documents simultaneously.**
- 13.7 Save the documents and Test the web page by loading it into a browser.**

14 Perform the task to apply externally linked multimedia objects in a web page.

- 14.1 Add links to multimedia in a home page.**
- 14.2 Add an external image.**
- 14.3 Convert among image formats.**
- 14.4 Show skill on image formatting**
- 14.5 Insert a video.**
- 14.6 Convert the video file formats.**
- 14.7 Insert a sound file.**
- 14.8 Convert the audio file formats.**
- 14.9 Install the document on the web site.**

15 Perform the task to create a simple style sheets using CSS.

- 15.1 Open the HTML document to edit in any favorite editing environment.**
- 15.2 Locate the position in which content to be added.**
- 15.3 Begin style sheet section using STYLE tag and TYPE attributes for specify the MIME type.**
- 15.4 Specify CSS rules inside the curly braces**
- 15.5 Specify property name followed by colon and property value.**
- 15.6 Specify properties separated by semicolon.**
- 15.7 Specify the background color of the element.**
- 15.8 Specify the font-family property.**
- 15.9 Apply class attribute styles.**
- 15.10 Save the document.**
- 15.11 Test the document using an appropriate browser(explorer).**

16 Perform the task to use Photoshop in HTML page

- 16.1 Create an interactive Button**
- 16.2 Make menu button using html code and Image**
- 16.3 Show skill to use HTML bdo tag**

16.4 Show skill to use span tag.

17. Perform the task to work with style sheet.

17.1 Use external style sheet

17.2 Use internal style sheet

17.3 Use inline style

17.4 Use multiple style sheet

18. Perform the task to apply further CSS in html page

18.1 Open the HTML document

18.2 Show skill to state Div concept.

18.3 Apply Div ID and Div class in html page

18.4 Show skill on Keywords, Float, position, clear

18.5 Apply padding and margin in html page.

19. Perform the task to show skill on further CSS property.

19.1 Show skill on letter spacing property

19.2 Show skill on word spacing property

19.3 Use text align and line height property

19.4 Use background position, URL, Repeat etc. properties

20. Perform the task to show skill on CSS box model.

20.1 Show skill to state the concept of Border.

20.2 Use border width, border style and border color in HTML page

20.3 Apply border radius

20.4 Use box shadow

21. Perform the task to show skill on CSS styling Table

21.1 Use Table caption

21.2 Use table columns

21.3 Apply other table style

21.4 Use background gradient color

21.5 Show skill on dropdown Menu design.

22 Perform the task to show the use of Java Script for web design

22.1 Show skill to state the concept of java script.

22.2 Use JS function and Event

22.3 Show the use of interactive Event, interactive link and JS slide show.

22.4 Show skill on Form validation/Input validation.

23 Perform the task to show skill on PSD to HTML and CSS convert.

24 Perform the task to check validity of a html documents.

24.1 Open the XHTML document to edit in any favorite editing environment.

23.2 Prepare a simple web page

23.3 Specify the Locate of the file or URL

23.4 Upload the file to the site at

“validator.w3.org/filename.html.”

25 Develop a website from first concept up to the final process of posting the actual site on the web.

26 Perform the task to design and develop a web page of your Department/ Institute or any other organization containing formatted text, table, forms ordered and unordered list items, image, video, sound and Style Sheets including some linked pages.

REFERENCE BOOK and site

1 HTML- IV - by John Zakour, Jeff Foust, David Kerven Course Platforms

<http://acaddb.hvcc.edu/~a.hurd/ciss220/web03/classnotes.htm>

<http://www.w3schools.com/html/default.asp>

•www.w3.org/TR/xhtml11

•www.xhtml.org

•validator.w3.org

5851	BOOK KEEPING & ACCOUNTING	T	P	C
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AIMS

- To be able to understand the principles and practices of book keeping and accounting.
- To be able to understand the procedures of general accounting, financial accounting and their applications.

SHORT DESCRIPTION

Concept of book keeping and accounting; Transactions; Entry systems; Accounts; Journal; Ledger; Cash book; Trial balance; Final accounts; Cost account & financial accounting; Depreciation; Public works accounts.

DETAIL DESCRIPTION

1 Understand the concept of book keeping and accounting.

- 1.1 Define book keeping and accountancy.
- 1.2 State the objectives of book keeping.
- 1.3 State the advantages of book keeping.
- 1.4 Differentiate between book keeping and accounting.
- 1.5 State the necessity and scope of book keeping and accounting.

2 Understand the transactions.

- 2.1 Define transactions and business transaction.
- 2.2 Explain the importance of transactions.
- 2.3 Describe the characteristic features of transactions.
- 2.4 Discuss the classification of transaction.
- 2.5 Identify the transaction from given statements stating reasons.

3 Understand the entry system.

- 3.1 State the aspects of transactions.
- 3.2 Define single entry system.
- 3.3 State the objectives of single entry system.
- 3.4 Discuss the disadvantages of single entry system.
- 3.5 Define double entry system.
- 3.6 Discuss the principles of double entry system.
- 3.7 Justify whether double entry system is an improvement over the single entry system.
- 3.8 Distinguish between single entry and double entry system of book keeping.

4 Understand the classification of accounts.

- 4.1 Define accounts.
- 4.2 State the objectives of accounts.
- 4.3 Illustrate different type of accounts with example.
- 4.4 Define "Golden rules of Book keeping".
- 4.5 State the rules for "Debit" and "Credit" in each class of accounts.
- 4.6 Determine Debtor (Dr) and Creditor (Cr.) from given transactions applying golden rules.
- 4.7 Define accounting cycle.
- 4.8 State the different steps of accounting cycle.

5 Understand the Journal.

- 5.1 Define Journal.
- 5.2 State the object of Journal.
- 5.3 State the functions of Journal.

- 5.4 Mention the various names of Journal.
- 5.5 Interpret the form of Journal.
- 5.6 Journalize from given transactions.

6 Understand the ledger.

- 6.1 Define ledger.
- 6.2 Interpret the form of ledger.
- 6.3 State the functions of ledger.
- 6.4 Distinguish between Journal and Ledger.
- 6.5 Prepare ledger from given transactions.
- 6.6 Explain why ledger is called the king of all books of accounts.

7 Understand the cash book.

- 7.1 Define cash book (single, double and triple column).
- 7.2 Explain cash book as both Journal and Ledger.
- 7.3 Prepare double column cash book from given transactions showing balances.
- 7.4 Prepare triple column cash book from given transaction and find out the balances.
- 7.5 Define petty cash book.
- 7.6 Prepare analytical and imprest system of cash book.
- 7.7 Define discount.
- 7.8 Explain the different types of discount.

8 Understand the trial balance.

- 8.1 Define trial balance.
- 8.2 State the object of a trial balance.
- 8.3 Discuss the methods of preparation of a trial balance.
- 8.4 Explain the limitations of a trial balance.
- 8.5 Prepare trial balance from given balance.

9 Understand the final accounts.

- 9.1 State the components of final account.
- 9.2 Distinguish between trial balance and balance sheet.
- 9.3 Identify the revenue expenditure and capital expenditure.
- 9.4 Select the items to be posted in the trading account, profit & loss account and the balance sheet.
- 9.5 State the adjustment to be made from the given information below or above the trial balance.
- 9.6 Prepare trading account, profit & loss account and balance sheet from the given trial balance & other information.

10 Understand the cost and financial accounting.

- 10.1 Define financial accounting.
- 10.2 State the objectives of financial accounting.
- 10.3 Define cost accounting.
- 10.4 Discuss the relationship between financial Accounting and cost accounting.
- 10.5 State the elements of direct cost and indirect cost.
- 10.6 Prepare cost sheet showing prime cost, factory cost, cost of production,

total cost and selling price.

10.7 Discuss the capital budgeting

10.8 Discuss the discounted cash flow method

10.9 Explain the following terms:

- a. Fixed cost b. Variable cost c. Factory cost d. Overhead cost e. Process cost
- f. Direct cost g. Operating cost h. Standard cost

11 Understand the depreciation

11.1 Define depreciation.

11.2 State the objects of depreciation.

11.3 Discuss the necessity for charging depreciation.

11.4 Describe the different methods of determining depreciation.

11.5 Explain the relative merits and demerits of different method of depreciation.

12 Understand the public works accounts.

12.1 State the important aspects of public works accounts.

12.2 Describe the main features of public works accounts.

12.3 Explain "Revenue and Grant".

12.4 Define Value Added Tax (VAT)

12.5 State the merits and demerits of VAT.

12.6 Define Bill and Voucher.

5840 ENVIRONMENTAL MANAGEMENT

T	P	C
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AIMS

- To be able to understand the basic concepts of environment and environmental pollution.
- To be able to understand the concepts of ecology, ecosystems, global environmental issues, air pollution, water pollution, soil pollution, radioactive pollution, sound pollution, etc.
- To be able to understand the methods of controlling air pollution, water pollution and sound pollution.
- To be able to understand the management of waste, soil and pesticide pollution and
- To be able to understand the major environmental issues and problems in Bangladesh.

SHORT DESCRIPTION

Basic concepts of environment; Ecology & eco-systems; global environmental issues Air and atmospheric layers; Air pollution sources & effects; climate change, green house effect and depletion of ozone layer; Control of air pollution; Water pollution sources & effects; Monitoring of water pollution; Waste water treatment; Sound pollution and its control; Soil pollution and its management; Radioactive pollution and its control; Solid waste management; Major environmental issues and disaster management- Arsenic pollution; Pesticides pollution and its management, Environmental legislations and guidelines frame work and policy in Bangladesh.

DETAIL DESCRIPTION

1. Understand the basic concepts of environment.

- 1.1 Define: environment, Marine environment, Freshwater environment, Nutrients, Mangrove forest, Photo-chemical oxidant, Pollutant, Receptor, Sink, Pathways of pollutant, Speciation.
- 1.2 Mention the main components of environment.
- 1.3 Mention the functions of environment.
- 1.4 Describe natural environment, man-made environment and social environment.

2. Understand ecology and eco-systems.

- 2.1 Define ecology and eco-system.
- 2.2 Mention the range of tolerance in eco-system.
- 2.3 Explain the biotic and abiotic components of eco-system.
- 2.4 Explain briefly how does eco-system work.
- 2.5 Explain the stability of eco-system.
- 2.6 Explain the following ecological terms:
Food chain, Food web, Biodiversity, Biomass, Ecological pyramid, Pyramid of biomass, Pyramid of energy, Bio-concentration, Bio-magnification, Restoration ecology.
- 2.7 Narrate the following bio-geochemical cycles of eco-system.
 - a) Carbon cycle
 - b) Nitrogen cycle
 - c) Phosphorus cycle
 - d) Sulphur cycle.
 - e) Hydrologic cycle
- 2.8 Describe the following global environmental issues: Global environment, Earth and other environmental summits, climate change and ozone layer depletion.

3. Understand the air and the atmospheric regions.

- 3.1 Mention different layers of atmosphere.
- 3.2 Mention the average composition of the atmosphere at sea level.
- 3.3 Describe the chemical species and particulates present in the atmosphere.

3.4 Describe the importance ozone layer.

4 Understand the air pollution and its sources & effects.

4.1 Define air pollution.

4.2 Mention the composition of clean dry atmospheric air.

4.3 List the air pollutants.

4.4 Identify the sources of air pollutions.

4.5 List the green house gases.

4.6 Mention the effects of air pollution on human health, animals, plants and non-living things.

4.7 Explain the formation of photo-chemical smog and its effect.

4.8 List the disasters of major air pollution in the world mentioning location, causes and effects.

4.9 Explain the causes of acid rain and its effect on eco-system.

5 Understand the control of air pollution at the sources.

5.1 Mention the methods of air pollution control.

5.2 Describe the following devices: gravitational settling chamber, cyclone separator, wet scrubber, centrifugal scrubber, fabric filter, catalytic converter.

6 Understand the sources of water pollution and its effects.

6.1 Define water pollution.

6.2 Mention the specification of ideal water as per recommendation of the World Health Organization (WHO).

6.3 List the different types of water pollutants.

6.4 Describe the sources of water pollution.

6.5 Describe the effects of water pollution on human health, animal, plants and environment.

7 Understand the monitoring of water pollution.

7.1 Define the following terms:

(i) Dissolved oxygen (DO).

(ii) Biochemical oxygen demand (BOD).

(iii) Chemical oxygen demand (COD).

(iv) Total organic carbon (TOC).

(v) Threshold limit value (TLV).

7.2 Mention the method of determination of pH value of water.

7.3 Mention the method of determination of dissolved oxygen (DO) in a sample of water.

7.4 Mention the method of determination of biochemical oxygen demand (BOD) in a sample of water.

7.5 Mention the method of determination of chemical oxygen demand (COD) in a sample of water.

8 Understand the waste water treatment.

8.1 Define the primary treatment, secondary treatment and tertiary treatment of waste water.

8.2 Define the following terms; ETP, Oxidation pond, waste stabilization pond, trickling filter, Activated slug.

8.3 Mention the methods of primary and secondary treatment of industrial waste water.

9 Understand the sound pollution and its control.

9.1 Define sound, sound wave and sound pollution.

9.2 Mention the scale of measuring sound intensity.

9.3 Mention the sources of sound pollution.

9.4 Describe the effect of sound pollution on human health.

9.5 Describe the methods of control of sound pollution.

10 Understand the soil pollution and its management.

- 10.1 Define soil pollution.
- 10.2 List the classification of soil pollution.
- 10.3 Mention the sources of soil pollution.
- 10.4 Describe the effect of soil pollution on human health.

11 Understand the radioactive pollution and its control.

- 11.1 Define radioactive pollution.
- 11.2 Mention the sources of radioactive pollution.
- 11.3 List the causes of radioactive pollution.
- 11.4 Explain the effect of radioactive pollution on human health.
- 11.5 Describe the method of control of radioactive pollution.

12 Understand the solid waste management.

- 12.1 Define solid waste.
- 12.2 List the sources of solid waste.
- 12.3 Mention the classification of solid waste.
- 12.4 Mention the methods of collection of solid waste.
- 12.5 Mention the waste management strategies in Bangladesh.
- 12.6 Describe the recycling of solid wastes.
- 12.7 Describe the potential method of disposal of solid waste.

13 Understand the major environmental issues in Bangladesh.

- 13.1 List the major environmental issues in Bangladesh.
- 13.2 Describe the following disaster management of Bangladesh flood, cyclone, tidal surge, Cyclone(SIDR, AILA, Nargis, Tsunami), landslide, earthquakes and salinity.

14 Understand the arsenic pollution in Bangladesh.

- 14.1 Mention the arsenic pollution of water in Bangladesh.
- 14.2 Explain the effects of arsenic pollution on human health.
- 14.3 Describe the causes of arsenic in ground water.

15 Understand the pesticide pollution in Bangladesh and its management.

- 15.1 Define pesticide.
- 15.2 Make a list of pesticides.
- 15.3 Mention the causes of pesticide pollution in Bangladesh.
- 15.4 Describe the effect of pesticide pollution in the environment.

16 Understand the national environmental legislations and guidelines environmental frame work and policy in Bangladesh.

- 16.1 Define, EA, EIA, IEA, NEMAP, DOE, BELA, GPS, GIS
- 16.2 Mention environmental act and legislations prescribed for air and water quality.
- 16.3 Describe environmental act prescribed for industries in Bangladesh.
- 16.4 Describe the guide lines of environment prescribed for industries in Bangladesh.
- 16.5 Describe the environmental frame work in Bangladesh.

REFERENCE BOOKS

১. পরিবেশ দূষণ (১ম ও ২য় খণ্ড)
— আবদুল মালেক ভূইয়া — গৌতম পাল
২. বিপন্ন পরিবেশ ও বাংলাদেশ
— ডঃ এফ এম মনিরুজ্জামান
৩. বায়ু ও পানি দূষণ এবং প্রতিকার

8. পরিবেশ বিজ্ঞান – মুহাম্মদ কাউছার হাবিব ভূইয়া
৫. শব্দ ও তেজস্ক্রিয় দূষণ এবং প্রতিকার – মুহাম্মদ কাউছার হাবিব ভূইয়া
৬. মাটি ও তেজস্ক্রিয় দূষণ এবং প্রতিকার – মুহাম্মদ কাউছার হাবিব ভূইয়া
7. Pollution control in process industries – S. P. Mahajan
8. Environmental Engineering – Peavy, Rowe and Techobanglous
9. Air pollution – V. P. Kudesia
10. Industrial Noise Control – Bruce Fader
11. Pesticide Pollution – Kudecsia and Charaya
12. Water Pollution – V. P. Kudesia
13. Peoples Report on Bangladesh Environment 2001
Atia Rahman, M. Ashraf Ali and Farooque Choudhury

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM

COMPUTER TECHNOLOGY (66)

**SYLLABUS
(COURSE STRUCTURE-2010)**

SIXTH SEMESTER

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM
COMPUTER TECHNOLOGY
SYLLABUS

SIXTH SEMESTER

6661 MICROPROCESSOR AND MICROCOMPUTER -II

T P C
3 3 4

AIMS

- To be able to develop the knowledge on the architecture and programming model of 8086 microprocessors.
- To be enable of writing program using 8086 & microprocessors.
- To be able to develop the knowledge and skill on memory, I/O and interrupt interface of 8086 microprocessor.

SHORT DESCRIPTION

Intel family of microprocessor fundamentals, Architecture and assembly language programming of 8086 microprocessor, Memory, I/O & interrupt interface of 8086 and multicore microprocessor fundamentals.

DETAIL DESCRIPTION

Theory:

1. Understand the architecture of Intel 8086 / 8088 microprocessor.
 - 1.1Mention the general features and electrical characteristics of 8086 / 8088 microprocessor.
 - 1.2State the pin signals of 8086 / 8088microprocessor.
 - 1.3Describe the minimum & maximum mode signals of 8086 / 8088 microprocessor.
 - 1.4Describe the function of each block of 8086 microprocessor architecture.
 - 1.5Describe the register structure of the 8086 microprocessor.
 - 1.6Explain the minimum / maximum system mode interface of 8086 microprocessor.
 - 1.7Explain the instruction execution sequence of 8086 microprocessor.
2. Understand the 8086 addressing mode and programming concept.
 - 2.1Mention the addressing mode of 8086 microprocessor.

- 2.2 Describe the addressing mode of 8086 microprocessor for accessing immediate and register data, data in memory, I/O ports, etc.
 - 2.3 Describe the software model of the 8086 microprocessor.
 - 2.4 Describe the software functions of the internal registers.
 - 2.5 Explain the effect in registers before and after the instruction execution for different addressing modes of 8086 microprocessor.
 - 2.6 Describe the 8086 instruction set.
 - 2.7 Explain the instruction format of 8086 microprocessor.
3. Understand the assembly language programming of 8086 family.
 - 3.1 Define the assembler pseudo instructions.
 - 3.2 Describe the use of assembler directives (i. e. SEGMENT, ENDS, ASSUME, DUP, etc.)
 - 3.3 Describe the use of program development tools (i.e. editor, assembler, linker, locator debugger and emulator.)
 - 3.4 Explain the sequential, IF-THEN-ELSE, WHILE-DO and REPEAT-UNTILL structure in 8086 assembly language with pseudo code and flow chart.
 - 3.5 Write assembly language programs.
4. Understand the memory interface of the 8086 microprocessor.
 - 4.1 Sketch the 8086 system memory interface.
 - 4.2 State the meaning of even & odd address boundaries.
 - 4.3 Describe the organization of IBM address space of 8086 microprocessor.
 - 4.4 Define the active non-overlapping/overlapping memory segments.
 - 4.5 State the dedicated & general use of memory in 8086 microprocessor.
 - 4.6 Explain the generation of physical memory address showing the relationship between logical segment address & offset and physical memory address.

- 4.7 Describe the hardware organization of the memory address space of 8086.
 - 4.8 Describe the functions or use of memory control signals of 8086 microprocessor.
 - 4.9 Describe the memory read and write bus cycle of 8086 microprocessor.
 - 4.10 Explain the technique to de-multiplex the system bus.
5. Understand the input / output interface of the 8086 microprocessor.
 - 5.1 Describe the 8086 system I/O interface.
 - 5.2 Describe the I/O address space of the 8086 system.
 - 5.3 Describe the operations of I/O instructions in 8086 microprocessor.
 - 5.4 Describe the I/O read and I/O write bus cycle of 8086 microprocessor.
 - 5.5 Describe the operation of the circuit to implement the parallel output ports in 8086 systems.
 6. Understand the interrupt interface of the 8086 microprocessor.
 - 6.1 Mention the types of interrupts.
 - 6.2 Describe the common features of different types of interrupts.
 - 6.3 Sketch the map of interrupt vector table.
 - 6.4 State the function and use of each address pointer or vector.
 - 6.5 Describe the function, format and operation of interrupt instructions.
 - 6.6 Describe the external hardware interrupt interface of the 8086 microprocessor.
 7. Understand the memory and I/O system of a microprocessor based PC.
 - 7.1 Describe the memory map of a personal computer.
 - 7.2 State the meaning of TPA and XMA.
 - 7.3 Describe the memory map of the TPA in a PC.

- 7.4 Explain the system area of a typical PC.
 - 7.5 Describe the I/O map of a PC.
 - 7.6 Describe the physical memory system of a Pentium microprocessor.
8. Understand the bus interface system of a microcomputer.
- 8.1 State the meaning of bus interface.
 - 8.2 Mention the names of different bus interface.
 - 8.3 Draw the structure of PCI bus.
 - 8.4 State the advantages of PCI bus.
 - 8.5 Draw the structure of AGP.
 - 8.6 State the main features of AGP.
 - 8.7 Describe the structure of different memory interfaces.
9. Understand the new features of 16 and 32 bit microprocessor.
- 9.1 List some 16 bit microprocessor of different company with specification.
 - 9.2 Describe the operation of each functional unit of Intel 80286 microprocessor.
 - 9.3 State the function of each bit of an EFLAG.
 - 9.4 State the meaning of real mode and protected mode operation.
 - 9.5 Describe the real mode memory addressing scheme using a segment address plus an offset.
 - 9.6 Mention the functions of selectors and descriptors .
 - 9.7 Draw the descriptor format of Intel 80286.
 - 9.8 Describe the protected mode memory addressing technique.
10. Understand the operation of the Pentium microprocessors.
- 10.1 List the names of Pentium processors.

- 10.2 State the detail specification of each types of Pentium processors.
- 10.3 Define superscalar architecture of Pentium processor.
- 10.4 State the function of BIST in Pentium processor.
- 10.5 Describe the new features and recent development of Pentium series processors (Intel Pentium I, II, III & IV)

11 Understand the feature of multicore microprocessors.

- 11.1 State multiprocessing and parallel processing.
- 11.2 Define multicore microprocessors (i.e. Dual core, Quad core, core ix).
- 11.3 List the name various type of multicore microprocessors.
- 11.4 Write down the advantages of multicore microprocessors.

Practical:

1. Perform the task to transmit 8 bit data from a microprocessor to an I/O module through a PPI using Intel 8086/8088 based microprocessor trainer
2. Perform the task to receive 8 bit data from an I/O module to the microprocessor through a PPI using Intel 8086/8088 based microprocessor trainer
3. Perform the task to detect and display the number of pulses through a PPI using Intel 8086/8088 based microprocessor trainer.
4. Perform the task to transmit 8 bit data from a microprocessor to an I/O module through a PPI using handshaking technique in a Intel 8086/8088 based microprocessor trainer
5. Perform the task to Receive 8 bit data from an I/O module to the microprocessor through a PPI using handshaking technique in a Intel 8086/8088 based microprocessor trainer
6. Perform the task for controlling LED matrix to Flash and shift LEDs using Intel 8086/8088 based microprocessor trainer.
7. Perform the task to display a character in a LED matrix using Intel 8086/8088 based microprocessor trainer.
8. Perform the task to shift and change the character in a LED matrix using Intel 8086/8088 based microprocessor trainer
9. Perform the task for controlling the steps of a stepper motor using Intel 8086/8088 based microprocessor trainer
10. Perform the task for controlling the start stop and direction using Intel 8086/8088 based microprocessor trainer
11. Perform the task for controlling the rotational speed of an DC motor using Intel 8086/8088 based microprocessor trainer

12. Perform the task to generate a triangular / square wave voltage using Intel 8086/8088 based microprocessor trainer
13. Perform the task to convert digital signal to analog form using Intel 8086/8088 based microprocessor trainer
14. Perform the task to convert analog signal to digital form using Intel 8086/8088 based microprocessor trainer
15. Perform the task to control the traffic light using Intel 8086/8088 based microprocessor trainer

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1. Microprocessor and Microcomputer Based System Design
- Mohamed Rafiquzzaman
2. The 8086 and 80286 Microprocessor
- Avtar Singh
3. The Intel Microprocessor
- Barry

6662 COMPUTER PERIPHERALS

T	P	C
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AIMS

- To be able to develop the knowledge & skill in peripherals & their interface.
- To be able to acquire the knowledge and to develop the skill on working principle & operation of peripheral devices.

SHORT DESCRIPTION

Peripheral interface and peripherals; Input-Output devices; Display devices; Special I/O devices; Disk, disk drives and controllers.

DETAIL DESCRIPTION

Theory:

PERIPHERAL INTERFACE

1. Understand the basics of interfacing.

- 1.1 Define peripheral and interfacing with example
- 1.2 State the functions and necessity of interfacing .
- 1.3 State the Categories of interface(Memory interface, I/O port/latch interface, peripheral interface ,Inter system communication interface, System overhead interface, Control interface)
- 1.4 State the function of each category of interface with example.
- 1.5 Mention the methods of peripheral interfacing.
- 1.6 State the steps of analog and digital interfacing in a computer system.
- 1.7 State the elements of interface.
- 1.8 Describe the function of a general purpose parallel interface with block diagram.

2. Understand the operation of serial interfaces.

- 2.1 State the necessity of serial interfacing.
- 2.2 Mention the asynchronous character and synchronous block data format for a serial interface.
- 2.3 Describe the operation of asynchronous serial interface with block diagram (UART).
- 2.4 Describe the operation of synchronous serial interface with block diagram.
- 2.5 Distinguish the Characteristics of asynchronous and synchronous serial interface.
- 2.6 Describe the operation of an USART with block diagram.
- 2.7 Describe the operation of RS 232.C/v.24 standard serial interface with block diagram.

INPUT-OUTPUT DEVICES

3 Understand the operation of keyboard and mouse.

- 3.1 Describe the construction and operation of mechanical, membrane, capacitive and Hall effect key switches.
- 3.2 Mention the desirable quality of key switches.
- 3.3 Describe the operation of keyboard encoder with block diagram.
- 3.4 State the terms: bouncing, n-key rollover and n-key lockout.
- 3.5 Explain the flowchart for scanning the keyboard.
- 3.6 Describe the principle of hardware de-bouncing.

- 3.7 Describe the operation of an opto-mechanical mouse.
- 3.8 Describe the working principle of an optical mouse.
- 3.9 Describe the operation of wireless keyboard
- 3.10 Describe the operation of wireless mouse

4 Understand the basic operation of displays and adapters.

- 4.1 Classify the display devices.
- 4.2 Describe the operation of a CRT.
- 4.3 State the meaning of the terms-pixel,scanning,Horizontal and Vertical scanning,interlace and non interlace scanning,composite video signal raster and VRAM.
- 4.4 Describe the principle of producing a character on a CRT display.
- 4.5 Describe the function of each block of the circuitry to produce one page dot-matrix character on CRT.
- 4.6 Describe the principle of producing color pixel on CRT screen.
- 4.7 Describe the operation of a color monitor using block diagram.
- 4.8 Describe the principle of LCD .
- 4.9 Describe the general structure of a modern graphics adapter.
- .10 Prepare the specification of a CRT/LCD monitor.

5 Understand the constructional and operational feature of dot matrix printers and plotter

- 5.1 Classify printers.
- 5.2 State the feature of a dot-matrix printer.
- 5.3 Describe the operation of a dot matrix printer.
- 5.4 List the Major parts and components of a dot matrix printer.
- 5.5 State the function of each parts and components used in printing mechanism.
- 5.6 Describe the operation of the head driving circuit in a dot matrix printer.
- 5.7 Mention the advantages and disadvantages of dot matrix printers.
- 5.8 Prepare the specification of a dot matrix printer.
- 5.9 State the features of plotter.
- 5.10 Describe the operation of plotter.

6 Understand the operation of inkjet printers.

- 6.1 State the principle of inkjet and bubble jet formation for printing.
- 6.2 Describe the operation of an inkjet printer.
- 6.3 List the Major parts and components of an inkjet printer..
- 6.4 Mention the advantages and disadvantages of an inkjet printer..
- 6.5 Prepare the specification of an inkjet printer.

7 Understand the operation of LASER printers.

- 7.1 State the meaning of LASER.
- 7.2 Describe the operation of a LASER printer.
- 7.3 List the Major parts and components of a LASER printer.
- 7.4 State the function of each part and components of a LASER printer
- 7.5 Mention the advantages and disadvantages of an inkjet printer.
- 7.6 Prepare the specification of a LASER printer.

7.7 Mention the steps of data exchange via parallel interface.

SPECIAL I/O DEVICES

8 Understand the characteristics of special type I/O devices.

- 8.1 List the special types of I/O devices.
- 8.2 State the characteristics of joy-stick and digitizer.
- 8.3 Describe the working principle of light pen.
- 8.4 Classify and define different type of scanner.
- 8.5 Describe the operation of a flat bed scanner.
- 8.6 State the use of hand held scanner.
- 8.7 Define OMR, OCR, ICR and MICR.
- 8.8 Describe the characteristics of OMR, OCR, ICR and MICR.
- 8.9 Describe the advantages and limitations of MICR.

DISK, DISK DRIVES AND CONTROLLERS

9 Understand the operation of Hard disk, CD ROM drives and DVD drives .

- 9.1 State the methods of data recording (punch card/paper tape, magnetic tape, magnetic disk and optical)
for μ C systems with example.
- 9.2 State the features of a flash memory as a secondary storage device.
- 9.3 Mention the data storage layout of a disk.
- 9.4 Describe the operation of a hard disk controller with block diagram.
- 9.5 Describe the operation hard disk drive.
- 9.6 Describe the recording principle in a CD and DVD.
- 9.7 Describe the operation of a optical disk drive (CD drive) and DVD drives.
- 9.8 State the features of a re-writable optical disk.
- 9.9 Describe the operation of USB devices

Practical:

1. Identify the external and internal over view with major features and components of a keyboard.
2. Identify the controls (external & internal) and major components of a color CRT.
3. Identify the mechanical assembly and the electronic part of a LCD monitor
4. Identify the mechanical assembly and the electronic part of a dot-matrix printer.
5. Identify the mechanical assembly and the electronic part of a LASER printer.
6. Identify the parts and components of an Inkjet printer.
7. Identify the major parts of a display adapter.
8. Identify the external and internal parts and components of a mouse
9. Identify the external and internal parts and components of a scanner.
10. Identify the external and internal parts and components of a plotter.
11. Identify the parts and components of a Hard Disk Drive.
12. Identify the parts and components of a DVD drive.
13. Install driver software of various peripheral devices

REFERENCE BOOKS

1. Computer Peripherals – Barry wilkinson and David Horocks.
2. Microprocessors and Interfacing – Douglas V Hall

3. Microprocessors –K.C. SHET & K.M. HEBBAR
4. The Indispensable PC hardware – Hans Peter Messner.
5. *en.wikipedia.org/wiki/Apple_Wireless_Keyboard*
6. *en.wikipedia.org/wiki/Mouse_(computing)*
7. *en.wikipedia.org/wiki/DVD_player*

6663 DATA COMMUNICATION AND COMPUTER NETWORKS-1	T	P	C
	2	6	4

AIMS

- To be able to acquire the knowledge on communication Basics.
- To be able to provide the knowledge and to develop skill on signal and data transmission systems and transmission media.
- To be able to acquire the knowledge on Digital communication and computer networks
- To be able to provide the knowledge and to develop skill on network topologies and protocols
- To be able to provide the knowledge and to develop skill on MODEM, Hub, Switch, NIC and Repeater.
- To be able to establish / implement a LAN to provide Network services.

SHORT DESCRIPTION

communication Basics, Analog and digital Modulation and demodulation , Analog and digital communication, Transmission media and connectors. Network fundamentals; Topologies and protocols, NIC, Network Addressing .and LAN.

DETAILS DESCRIPTION

Theory:

1 Understand communication basics.

- 1.1 Define Electronic Communication.
- 1.2 Mention the basic elements of a communication system.
- 1.3 Describe communication system with a simple block diagram.
- 1.4 State the terms :Frequency, Wavelength, Spectrum, Bandwidth, Throughput, propagation speed, propagation time, Noise figure & SNR
- 1.5 Mention the difference between bandwidth and data rate.
- 1.6 Describe simplex, half-duplex and full duplex modes of communication.
- 1.7 Describe synchronous and asynchronous communication techniques.

2 Understand Analog communication system

- 2.1 Define Modulation and Demodulation.
- 2.2 State the necessity of modulation.
- 2.3 Mention the types of modulation.
- 2.4 Describe amplitude, Frequency and Phase modulation with necessary waveform.
- 2.5 State the meaning of modulation index and percentage of modulation.
- 2.6 State the comparison of amplitude, Frequency and Phase modulation.
- 2.7 State the difference between analog and digital modulation
- 2.8 Describe ASK, FSK, PSK and QPSK with necessary waveform and bandwidth.
- 2.9 State the advantage and disadvantages of ASK, FSK and PSK (BPSK)

3 Understand Digital communication system

- 3.1 Define digital modulation.
- 3.2 Describe Digital communication system with block diagram.
- 3.3 Define linecoding.
- 3.4 Mention the categories of Line coding
- 3.5 State Unipolar Linecoding with timing diagram and its drawbacks.
- 3.6 Describe different types of polar encoding with necessary timing diagram.

4 Understand transmission media and connectors.

- 4.1 Mention the categories of. transmission media
- 4.2 Describe the construction of Twisted-pair (STP, UTP) Co-axial and fiberoptic cable.
- 4.3 State the characteristics of Twisted-pair (STP, UTP), Co-axial and fiber optic cable including their connectors.

- 4.5 State difference between baseband and broadband cables.
- 4.6 State the advantage and disadvantages of each types of cables.
- 4.7 Describe the method of Radio,microwave and infrared communication system.
- 4.8 State the characteristics of Radio,microwave and infra red communication system.

5 Understand multiplexing techniques

- 5.1 Define multiplexing and Demultiplexing process of communication system.
- 5.2 State the necessity of multiplexing.
- 5.3 Mention the categories of multiplexing.
- 5.4 Define Frequency division multiplexing.
- 5.5 Describe Frequency division multiplexing and demultiplexing technique with block diagram
- 5.6 Describe the Wave division multiplexing and Demultiplexing technique with block diagram
- 5.7. Define Time division Multiplexing.
- 5.8. Describe the process of synchronous Time division Multiplexing.
- 5.9. Describe the principle of Code division multiplexing system.

6 Understand computer network basics.

- 6.1 Define Computer Network
- 6.2. State the concept of computer Network.
- 6.3 Mention elements of computer network.
- 6.4 Describe the advantages of Computer network.
- 6.5 Describe the application of computer network.
- 6.6 Describe client / server and peer-to-peer network.
- 6.7 Describe the general features of LAN, MANs and WANs.

7 Understand the network topologies.

- 7.1 Define topology.
- 7.2 Mention the difference between physical and logical topology.
- 7.3 Describe the physical connection of bus, ring, star and hybrid topologies.
- 7.4 Mention the advantages and disadvantages of bus, ring, star and hybrid topologies.
- 7.5 Describe the factors to select a particular topology.
- 7.6 Describe the logical topologies of a token ring network.

8 Understand network protocols.

- 8.1 Define network protocol.
- 8.2 Describe the main elements of protocol.
- 8.3 Describe the characteristics of protocol.
- 8.4 Describe the functions of protocol.
- 8.5 List different types of network protocols.
- 8.6 State the function of TCP/IP protocol.

8 Understand IP addressing.

- 9.1 Define Network Addressing.
- 9.2 State the format of physical address of a NIC.
- 9.3 Define IP.
- 9.4 Describe the IP address Formats of Class A,B,C,D,E with example.
- 9.5. Describe subnet and subnet masks.
- 9.6 Define IPv6.

10 Understand Network Interface Cards (NIC)

- 10.1 State the role of NIC.
- 10.2 Describe the network address.
- 10.3 Mention the points that agree both the sending and receiving NICs.
- 10.4 State the importance of base memory address for NIC.
- 10.5 Mention the important points to maintain the compatibility among NIC, bus and cables.
- 10.6 Describe the NIC related factors that enhanced the performance of network.

11 Understand the connectivity devices.

- 11.1 List the connectivity devices used in networking.
- 11.2 Describe function of MODEM..
- 11.3 Describe MODEM types and Standard.
- 11.4 Describe the features of ADSL and Digital MODEM.
- 11.5 Describe the functions of Hubs, Repeaters and switches in network.
- 11.6 Mention the types of Hubs.
- 11.7 Describe the important features of passive, active and intelligent Hubs.
- 11.8 Describe the important features of Repeaters and switches.

Practical:

1. Identify different types of guided communication media (UTP,STP,Co-axial and fiber-optic cable) and observe their constructional features.
2. Identify different types of connectors and accessories used with UTP,STP,Coaxial and fiber-optic cable and observe their constructional features.
3. Identify the Network Cards,Tools,Tester and Accessories(modems, Hub/Switch,Repeater ,switch etc.)
4. Connect RJ45 Connector with UTP Cable in the form of straight through /Cross Over.
- 5 Establish a Peer to Peer/Workgroup LAN
 - (a) Install NIC into the PC
 - (b)Check the MAC address of the NIC
 - (c) Connect cable connector with PC & Hub/Switch
 - (d) Configure the TCP/IP in each PC
 - (e) Test the connectivity of the PCs
- 6 Perform the task to Work with a Peer/Workgroup LAN environment for simple data communication.
 - (a) Share the folders / secondary memory.
 - (b) Share a printer or any other resources.
7. Extend a LAN using Hub/Switch/Repeater.
8. Establish a Client–Server Local Area Network
 - (a). Install Windows server into a server PC
 - (b).Configure TCP/IP to server and client PCs
 - (c).Perform the task to configure the Active Directory
 - (d) Perform the task to configure The DNS.
 - (e) Perform the task to configure the DHCP
9. Perform the task to Work with a Client–Server LAN environment for simple data communication and Administrative functions.

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1. Data communications and Networking – Behrouz A. Forouzan.
2. Fundamentals of communication-M. Shamim Kaiser and associates
- 3 Data communications and Networking – Behrouz A. Forouzan
- 4 Data and Computer Communications-William Stallings

5 Local Area Networking – S. K Basandra.
6 MCSE Windows & Networking Essential – Joe Casad

6664

COMPUTER SYSTEM SOFTWARE

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AIMS

- To be able to develop the skill and attitude to direct, control and manage of computer using operating system
- To be able to install the Windows Operating system
- To be able to install the LINUX Operating system
- To be able to develop skills to configure Windows Operating System.
- To be able to develop skills to configure and customize LINUX Operating

SHORT DESCRIPTION

Basic concepts of operating system; Process Management; CPU Scheduling, Deadlocks; I/O systems; Memory management; File system and Linux fundamentals; windows and Linux commands and utilities.

1 Understand the general features of operating system.

- 1.1 Define operating system, Kernel and monitor program.
- 1.2 Describe the functions(of kernel) and services of operating system
- 1.3 Describe the abstract view of the components of computer system.
- 1.4 Describe the evolution (history) of operating system.
- 1.5 Explain the role of operating system as an extended machine and as a resource manager.
- 1.6 Mention the important features of DOS, Windows, UNIX and LINUX.
- 1.7 Define the terms-Multiuser, Multitasking and GUI.

2 Understand the terms related to operating system.

- 2.1 Define batch processing system
- 2.2 Describe the method of batch processing system.
- 2.3 State the disadvantages of batch processing.
- 2.4 Describe the uses of job control language for operating system.
- 2.5 Describe the process of spooling.

3 Understand the basics of process management.

- 3.1 Define Process.
- 3.2 Describe the process state with diagram.

- 3.3 Mention the difference between process and program.
- 3.4 Describe the importance of process control.
- 3.5 Describe the function of Scheduler and traffic controller.
- 3.6 Explain the process Scheduling and scheduling queues.
- 3.7 Explain the race conditions and stalemate.
- 3.8 Describe the manner in which multiple processor may be used for multiprogramming.

4 Understand the concept of CPU Scheduling.

- 4.1 Define Scheduling.
- 4.2 State the types of Scheduling
- 4.3 Describe the Scheduling criteria.
- 4.4 State the terms CPU and I/O burst cycle, CPU Scheduler, Dispatcher.
- 4.5 Describe Scheduling Algorithms.(FCFS – First come first serve , SJF – Shortest job first , RR- Round Robin, Priority)

5 Understand the concepts of deadlock.

- 5.1 Define Deadlock, Preempt able and Non-Preempt table resources.
- 5.2 Mention the Necessary conditions of Deadlocks.
- 5.3 Describe the Deadlock Prevention.
- 5.4 Explain the Deadlock avoidance and their algorithm.
- 5.5 Describe the Deadlock detection algorithm
- 5.6 Explain the way of recovery from Deadlock.

6 Understand the concept of I/O system.

- 6.1 State the Characteristics and principle of I/O hardware.
- 6.2 Describe the role of Operating system in I/O operation.
- 6.3 Describe the I/O aspects of Operating System.
- 6.4 Describe the goals of I/O software.
- 6.5 Describe the function of each layer of I/O system.

7 Understand the technique of memory management.

- 7.1 Mention the function of memory management.
- 7.2 Describe the Single / Multiple partition scheme.
- 7.3 Explain fixed memory partition with separate / single input queue.
- 7.4 Explain the external and internal fragmentation.
- 7.5 Describe relocatable and dynamically relocatable partitioned allocation.
- 7.6 Describe Swapping.

- 7.7 Describe the segmented allocation and segmented page.
- 7.8 Describe the concept of virtual memory and demand paging.

8 Understand the concept of file system .

- 8.1 Mention the concept and attributes of file.
- 8.2 Describe the basic file operation.
- 8.3 State the terms : the file pointer, file open count, disk location of file.
- 8.4 Mention the file types with common features.
- 8.5 Define file system.
- 8.6 Describe the organization of file system.
- 8.7 Describe the features of general file system.
- 8.8 Describe the free space management of disk space.
- 8.9 Describe the allocation methods of disk space.

9 Understand the feature of Linux Operating system

- 9.1 State the background and importance of Linux.
- 9.2 Describe the features of Linux Kernel.
- 9.3 State the advantages of Linux Operating system.
- 9.4 State the features of GNOME and KDE desktop
- 9.5 Define Shell
- 9.6 Mention the name of different shell for different user.
- 9.7 State the function of Linux Shell.

Practical

1 Perform the task to install Linux operating system.

- 1.1 Arrange the necessary hardware for installing Linux network operating system
- 1.2 Insert the First CD/DVD in the appropriate installation drive.
- 1.3 Start the boot procedure.
- 1.4 Check the installation media.
- 1.5 Choose a Language
- 1.6 Choose a Keyboard.
- 1.7 Select monitor Configuration
- 1.8 Choose install type
- 1.9 Choose Partitioning strategy
- 1.10 Choose Partitioning options
- 1.11 Configure boot loader.
- 1.12 Configure advance boot loader
- 1.13 Configure networking

- 1.14 Choose firewall configuration.
- 1.15 Choose additional language support.
- 1.16 Choose a time zone.
- 1.17 Set root password.
- 1.18 Select packages.
- 1.19 Configure the monitor.
- 1.20 Finish installation.

2. Perform the task to Make partition to a Hard disk with disk Druid.

- 2.1 Delete the partition in disk druid.
- 2.2 Add a partitions in disk druid.
- 2.3 Edit a partitions in disk druid.
- 2.4 Write a reports.

3. Perform the task to Make partition to a Hard disk with fdisk .

3.1 Use fdisk command to list all partition,to see each partition is being used

and to change the partition.

- 3.2 Delete the partition.
- 3.3 Create partitions.
- 3.4 Change the partition type.
- 3.5 Display the partition table and exit.
- 3.6 Write a reports.

4. Perform the task to Use the FIPS utility.

- 4.1 Check windows /DOS partition.
- 4.2 Create a bootable FIPS Floppy.
- 4.3 Defragment the Harddisk.
- 4.4 Reboot(FIPS boot disk) and test.
- 4.5 Run FIPS
- 4.6 Reboot(FIPS boot disk) and test.
- 4.7 Restart the computer.
- 4.8 Write a reports.

5. Perform the task to Use GRUD boot loader.

- 5.1 Boot the computer with GRUD.
- 5.2 Change or Add boot options(Temporarily or Permanently).
- 5.3 Add a new GRUD boot image.
- 5.4 Write a reports

6. Perform the task to Use LILO boot loader.

- 6.1 Boot the computer with LILO.
- 6.2 Use the LILO .
- 6.3 Set the /etc /lilo.conf.file.
- 6.4 Change the boot loader.
- 6.5 Write a report.

7. Perform the task to work with Linux Desktop.

- 7.1 Log on into the Linux.

- 7.2 Familiar with the Desktop.
 - 7.2.1 Check the home folder.
 - 7.2.2 Change the preferences.
 - 7.2.3 Configure the panel/desktop.
- 7.3 Use the GNOME desktop.
- 7.4 Use the Metacity window manager
- 7.5 Use the GNOME Panel
- 7.6 Use Red Hat menu
- 7.7 Add applet,application launcher and drawer.
- 7.8 Change panel properties.
- 7.9 Choose and use KDE desktop.
- 7.10 Write a report.

8. Perform the task to manage files with the conqueror file manager.

- 8.1 Open a file.
- 8.2 Choose an application.
- 8.3 Delete,copy, paste,move and link files.
- 8.4 View quick file information,hiddenfiles,file system tree.
- 8.5 Display the system users with *who*.
- 8.6 Change icon size
- 8.7 Search for files
- 8.8 Create new file and folders.
- 8.9 Write a report.

9 Apply basic Linux commands and utilities.

- 9.1 Use the command options to modify the basic function of linux commands.
- 9.2 Use two or more linux commands in tandem by using input and output redirection.
- 9.3 Use the parameters with linux commands.
- 9.4 Select and use the notational shorthand used in linux documentation.
- 9.5 Use the linux online man pages and help facilities.
- 9.6 Use the wildcards.
- 9.7 Check the environmental variables.
- 9.8 List the processes running on the linux system.
- 9.9 Kill the processes.
- 9.10 Write a reports.

10. Work with the linux file system.

- 10.1 List the type of files and directories.
- 10.2 Move one directory to another.
- 10.3 Make a new file and directory.
- 10.4 Move and copy files.
- 10.5 Remove the files and directories.
- 10.6 Use *chown* and *chgrp* to change file and directory ownership.
- 10.7 Use *chmod* to change the file and directory permissions.

10.8 Use *gunzip* command to uncompress .gz files compressed by gzip.

10.9 Write a reports.

11. Work with bash (Bourne Again shell).

11.1 Select the most common shells used in linux.

11.2 Enter commands into bash.

11.3 Use wildcards that bash shell supports.

11.4 Use the history command with or without options.

11.5 Use the aliases command.

11.6 Use the input/output redirection command.

11.7 Show the use of pipeline.

11.8 Modify the bash shell.

11.9 Write a report.

12 Use file systems, disks and other derives.

12.1 Mount the flash / optical drives

12.2 Make a new file system.

12.3 Unmount the flash / optical drives.

12.4 Use tar and gzip.

12.5 Use tar command to backup files in flash / optical drives

12.6 Write a report.

13 Manage the users account.

13.1 Make the root (superuser) suppresser accounts.

13.2 Make the user accounts.

13.3 Add and delete users.

13.4 Delete groups.

13.5 Write a report.

14 Work with text editors.

14.1 Select the text editor in linux.

14.2 Use vi editor to enter & edit text.

14.3 Use emacs to enter & edit text.

14.4 Write a report.

15 Work with the printer in linux.

15.1 Select the printer to support in linux.

15.2 Configure the printer.

15.3 Use the commands lpr, lpq, lprm and lpc for printing documents under Linux.

15.4 Write a report.

16. Manage Data Using NTFS

16.1 Compress Data on an NTFS Partitions.

16.2 Configure Disk quotas on NTFS Partitions.

16.3 Secure flies by using EFS.

17. Monitor and Optimize Performance and implement security in Windows XP windows 2003 server /Windows 7 / windows 10.

17.1 Using Task Manager to Monitor system recourse.

17.2 Using system monitor to monitor system Performance.

17.3 Optimizing Performance.

17.4 Secure services using security policies.

17.5 Audite Access to system Resources.

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2. Operating Systems
By - Achyut S. Godbole
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3. Modern Operating Systems
By - Andrew S. Tanenbaum
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4. Computer Fundamentals
By- P.K.Sinha
5. Red Hat Fedora Linux 2 bible
By – Christopher Negus
6. Learning Red Hat Linux
By – Bill Mc Carty

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- 2) www.tatamcgrawhill.com
- 3) www.phindia.com
- 4) ww.wiley.com/college/silberschatz6e/0471417432/slides/ppt
- 5) www.en.wikipedia.org
- 6) www.computerworld.com
- 7) www.computer.howstuffworks.com
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AIMS

- To be able to identify the external features and the electrical connections of different units of a microcomputer system.
- To be able to develop the knowledge, skill and attitude in PC assembling and servicing.
- To be able to perform the maintenance of PC.
- To be able to develop the skill in error detection or correction.
- To be able to develop the skill in PC servicing.
- To be able to develop expertise in board/components level troubleshooting of power supply, monitor, printer and I/O devices.
- To be able to develop the skill in PC maintenance (hardware and software).
- To be able to develop the skill in network maintenance and troubleshooting.

SHORT DESCRIPTION

Identification of parts and their connections; Disassembling & assembling of PC; Software installation; Fault identification and correction, handling tools; Setting the PC for best operating environment; Software, hardware and special maintenance of PC

DETAIL DESCRIPTION**IDENTIFICATION OF NECESSARY EQUIPMENTS & CONNECTIONS FOR COMPUTER SERVICING**

- 1 Identify the internal & external controls and connectors of a microcomputer specially system unit.**
 - 1.1 Identify the proper tools, equipment and manuals.
 - 1.2 Trace the connections among different units.
 - 1.3 Unplug the power cord and disconnect the electrical connections among different units.
 - 1.4 Seek & draw the rare and front panel terminals, connectors & control knobs of system unit, monitor and other support equipment.
 - 1.5 Trace & draw the connection diagram among different units.
 - 1.6 Make a report.

DISASSEMBLING & ASSEMBLING OF PC

- 2 Disassemble the old working PC.**
 - 2.1 Select the required tools and equipment.
 - 2.2 Turn off the power.
 - 2.3 Unplug the power cord and disconnect the electrical connections among different units.

- 2.4 Unscrew and remove the cover of the system unit
- 2.5 Disconnect the cables and other connections with special paper pencil note of the connections.
- 2.6 Seek and remove the attached screw of the drives.
- 2.7 Seek and remove all the attached screws of different units connected with chassis.
- 2.8 Remove the individual units and put them in safe place.
- 2.9 Make a report.

3 Assemble a new PC.

- 3.1 Select the tools, manuals and individual hardware units for a new PC.
- 3.2 Unscrew the cover of the casing.
- 3.3 Set the assemble main board into the casing.
- 3.4 Fit the display card into the respective slot of the MB.
- 3.5 Connect the power connector into the MB.
- 3.6 Connect the monitor into the video terminal.
- 3.7 Connect the power cord(s) to the main line.
- 3.8 Check the display.
- 3.9 Place all other devices into the respective location of the casing.
- 3.10 Connect all the cables, power terminals, ports and other LED wires among the different units.
- 3.11 Check the display again.
- 3.12 Mount the cover and make a report.

4 Identify the main board components and layout.

- 4.1 Select the required tools, a new motherboard and manuals.
- 4.2 Seek the major chips, BIOS, socket, slots, connectors, jumpers etc. of the motherboard.
- 4.3 Draw the layout of a motherboard.
- 4.4 Make a report.

5 PARTITIONING & FORMATING HDD (USING DOS & THIRD PARTY SOFTWARE)

- 5.1 Connect a new HDD to PC
- 5.2 Format the HDD
- 5.3 Partitioned (Primary & Secondary) the HDD
- 5.4 Create more partition of Secondary partition
- 5.4 Make a report

6 CONFIGURING BIOS

- 6.1 Select the system unit, keyboard, mouse and monitor.
- 6.2 Connect the I/O units, other cables and cords with system unit.

- 6.3 Connect the power cord(s) to the main line
- 6.4 Turn on the power and then press the respective key to enter into the BIOS.
- 6.5 Set up the BIOS as required
- 6.6 Setup the supervisory & user password.
- 6.7 Save & exit from the BIOS.

7 INSTALLING OPERATING SYSTEM.

- 7.1 Select the new assembled PC, boot up disk or start up CD with operating system.
- 7.2 Insert the start up disk or CD into the respective drive.
- 7.3 Turn on the PC.
- 7.4 Take action according to the messages of POST routine and on-screen message.
- 7.5 Make the partitions into the hard disk. Using fdisk and modem windows Operating system.
- 7.6 Format the hard disk and transfer the system file.
- 7.7 Run the setup file and follow the on-screen message(s) to complete the installation procedures.

8 INSTALL DRIVER SOFTWARE SUCH AS SOUND CARD/ GRAPHICS CARD ETC.

- 8.1 Select the required software CDs.
- 8.2 Run the PC and open the system options from control panel.
- 8.3 Select the appropriate device driver options.
- 8.4 Remove the conflict-device-driver and reboot the system if required.
- 8.5 Follow the on-screen message to install the driver or follow the instructions of the manufacturer's manual.

9 INSTALL APPLICATION SOFTWARE SUCH AS MS OFFICE ETC.

- 9.1 Select the required elements or software CDs.
- 9.2 Start the PC to run the OS.
- 9.3 Insert the application software CD.
- 9.4 Run the setup file of the application and or follow the on screen messages to complete the installation procedures.

10 INSTALL UTILITY SOFTWARE SUCH AS ANTIVIRUS, MODEM ETC.

- 10.1 Select the required elements or software CDs.
- 10.2 Start the PC to run the OS.
- 10.3 Insert the software CD.
- 10.4 Run the setup file of the application and or follow the on screen messages to complete the installation procedures.

FAULT IDENTIFICATION AND CORRECTION

- 11 Perform the tasks to diagnosis the faults and repair the power supply of a PC.**
 - 11.1 Select required tools, equipment, manuals, etc.
 - 11.2 Note and record the nominal power connector voltages.
 - 11.3 Measure the voltages at different pins and check it with recorded tabulated voltages.
 - 11.4 Measure the power good signal.
 - 11.5 Write down the steps to check the power supply problems (e.g. for completely dead, momentarily work and fails after period of operation.
 - 11.6 Repair or replace the faulty PS with a good one.

- 12 Perform the tasks to identify the faults of motherboard and remedy the problems.**
 - 12.1 Select the required elements.
 - 12.2 Record the symptoms that are not attributable to a specific device.
 - 12.3 Check the systems basic physical conditions ensure that all internal cables are connected, expansion cards are seated, ICs are socketed properly.
 - 12.4 Disconnect the above mentioned elements and reinstall those to the appropriate location properly.
 - 12.5 Run the diagnostic (if the machine can boots) to seek the causes of faults.
 - 12.6 Check the memory errors and test both the base extended memory using advanced diagnostics or a third party product.
 - 12.7 List the system faults for motherboard problems.
 - 12.8 Write down the steps to replace a motherboard.

- 13 Perform the tasks to locate the faulty parts/components of a Laser printer and replace/repair the faulty parts/components.**
 - 13.1 Select the required tools, equipment and manuals.
 - 13.2 Open/Disassemble the printer using appropriate tools.
 - 13.3 Name the parts and components
 - 13.4 Locate the mechanical assembly and its parts, power supply section, main circuit board and their components.
 - 13.5 Check the condition of the scanning assembly, drum, fuser unit, head assembly, toner, gears etc.
 - 13.6 Detach the mechanical assembly and its parts, power supply section and main circuit board.
 - 13.7 Locate the faulty parts/components
 - 13.8 Replace the faulty parts/components
 - 13.9 Reassemble the parts and components using appropriate tools.

- 14 Perform the tasks to apply setup and optimization the PC performance.**
 - 14.1 List the name of the files that runs during booting.
 - 14.2 List the common device drivers that loaded at boot time.

- 14.3 Partition the hard disk for best performance.
- 14.4 Run the defragmenter to speed up the disk access.
- 14.5 Solve the most common configuration problems.
- 14.6 List the symptoms of virus affected machine.
- 14.7 List the name of virus detection software.
- 14.8 Load the anti-virus software into the machine.
- 14.9 Run the anti-virus to remove the virus.
- 14.10 List the preventive cares from virus infection.
- 14.11 Update the anti-virus software using offline/Online process.

15 Perform the tasks to provide careful preventive maintenance of PC.

- 15.1 Back up of all data.
- 15.2 Clean the PC, monitor, keyboard and other devices.
- 15.3 Check that all leads and cables are fully secured.
- 15.4 Clean the diskette drives using a commercial head cleaner.
- 15.5 Disconnect all cables and remove the system unit cover.
- 15.6 Clean out the deposited dirt.
- 15.7 Undo the retaining screws of each expansion card and remove it, reseal the socketed IC chips and replace it.
- 15.8 Check the all internal cables are fully secured.
- 15.9 Re-place the system unit cover, leads and cables and then test the machine.

REFERENCE BOOKS

- 1. Upgrading, Maintaining & servicing IBM PCs & Compatibles
by Julian Moss.
- 2. IBM PC AND CLONES
by B Govindarajalu.

AIMS

To be able to develop knowledge, skills and attitude to create a dynamic website
To be able to develop knowledge, skills and attitude about PHP and MySQL

SHORT DESCRIPTION

Development of a dynamic website using PHP and MySQL. In PHP, various topics are discussed and practiced such as variable, operators, conditional statements, looping, functions and objects. In MySQL, connect with PHP form, create and modify database, tables, insert data into table and retrieve, update, delete data from table are practiced.

DETAIL DESCRIPTION**1. Web Basic**

- 1.1 Difference between Web Design and Web Development
- 1.2 Difference between Static webpage and dynamic webpage
- 1.3 Define PHP.
- 1.4 *Define PHP File*
- 1.5 *Need of PHP*

2. Install PHP

- 2.1 *Need of PHP Installation*
- 2.2 *Use a Web Host with PHP Support*
- 2.3 *Set up PHP on Your Own PC*
- 2.4 *Practice Basic PHP Syntax*
- 2.5 *Use Comments in PHP*

3. PHP Variables

- 3.1 *Types of PHP Variables*
- 3.2 *Create (Declare) PHP Variables*
- 3.3 *Cause of Loosely Typed Language as a PHP*
- 3.4 *Scopes of PHP Variable*
 - 3.4.1 *Local Scope*
 - 3.4.2 *Global Scope*
 - 3.4.3 *Static Scope*
 - 3.4.4 *Parameter Scope*
- 3.5 *Use String Variables in PHP*
- 3.6 *Practice PHP Concatenation Operator*
- 3.7 *Practice PHP strlen() and strpos() function*
- 3.8 *Use & Practice different types of Operators*

4. PHP Conditional Statements & Looping

- 4.1 *Conditional Statements*

- 4.1.1 Write a program using *if* statement
- 4.1.2 Write a program using *if...else* statement
- 4.1.3 Write a program using *if...else if...else* statement
- 4.1.4 Write a program using *switch* statement

4.2 *PHP Loops*

- 4.2.1 Write a program using *while*
- 4.2.2 Write a program using *do...while*
- 4.2.3 Write a program using *for*
- 4.2.4 Write a program using *foreach*

5. PHP Arrays

- 5.1 Declare Array*
- 5.2 Work with Numeric Arrays*
- 5.3 Work with Associative Arrays*
- 5.4 Work with Multidimensional Arrays*

6. PHP Functions

- 6.1 Use different types of Built-in Functions*
- 6.2 Know about PHP Functions*
- 6.3 Create a PHP Function*
- 6.4 Add parameters in function*
- 6.5 Return values from function*

7. Objects

- 7.1 Create Classes and objects in PHP*
- 7.2 Create and use properties*
- 7.3 Work with method*
- 7.4 Practice Object Overloading with `_get()`, `_set()`, and `_call()`*
- 7.5 Use inheritance to extend the power of objects*
- 7.6 Use Constructors and destructors*

8. Demonstrate PHP Forms and User Input

- 8.1 Handle PHP Form*
- 8.2 Validate Form*
- 8.3 Use `$_GET` Variable & `method="get"`?*
- 8.4 Use `$_POST` Variable & `method="post"`.*
- 8.5 Use `$_REQUEST` Variable*

9. PHP MySQL Introduction

- 9.1 Define MySQL?*
- 9.2 Create relation between PHP and MySQL*
- 9.3 Know about Database, Tables and Queries*

10. PHP MySQL Connect to a Database

- 10.1 Create a Connection to a MySQL Database*
- 10.2 Closing a Connection*
- 10.3 Create a Database*
- 10.4 Create a Table*
- 10.5 Practice Primary Keys and Auto Increment Fields*

11. PHP MySQL Insert, Retrieve, Update, Delete

- 11.1 Insert Data Into a Database Table*
- 11.2 Insert Data From a Form Into a Database*
- 11.3 Select Data From a Database Table*
- 11.4 Display the Result in an HTML Table*
- 11.5 Fetch data using WHERE clause*
- 11.6 Use ORDER BY Keyword*
- 11.7 Update Data In a Database*
- 11.8 Delete Data In a Database*

Reference books and websites

1. www.w3schools.com
2. *Beginning PHP* – Matt Doyle

5841 BUSINESS ORGANIZATION & COMMUNICATION

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AIMS

- To be able to understand the basic concepts and principles of business organization.
- To be able to understand the banking system.
- To be able to understand the trade system and stock exchange activities in Bangladesh.
- To be able to understand the basic concepts of communication and its types, methods.
- to be able to perform in writing , application for job, complain letter & tender notice.

SHORT DESCRIPTION

Principles and objects of business organization; Formation of business organization; Banking system and its operation; Negotiable instrument; Stock Exchange; Home trade and foreign trade.

Basic concepts of communication Communication model& feedback; Types of communication; Methods of communication; Formal & informal communication; Essentials of communication; Report writing; Office management; Communication through correspondence; Official and semi- official letters.

DETAIL DESCRIPTION

1 Understand business organization.

- 1.1 Define business.
- 1.2 Mention the objects of business.
- 1.3 Define business organization.
- 1.4 State the function of business organization.

2 Understand the formation of business organization.

- 2.1 Define sole proprietorship, partnership, joint stock company. and co-operative
- 2.2 Describe the formation of sole proprietorship, partnership , joint stock company, & co operative.
- 2.3 Mention the advantages and disadvantages of proprietorship, partnership and joint stock company.
- 2.4 State the principles of Co operative & various types of Co operative.
- 2.5 Discuss the role of co-operative society in Bangladesh.

3 Understand the banking system and negotiable instrument.

- 3.1 Define bank.
- 3.2 State the service rendered by bank.
- 3.3 Describe the classification of bank in Bangladesh.
- 3.4 State the functions of Bangladesh Bank in controlling money market.
- 3.5 State the functions of commercial Bank in Bangladesh
- 3.6 Mention different types of account operated in a bank.
- 3.7 Mention how different types of bank accounts are opened and operated.
- 3.8 Define negotiable instrument.
- 3.9 Discuss various types of negotiable instrument.

- 3.10 Describe different types of cheque.
- 3.11 Define letter of credit.

4 Understand the home & foreign trade

- 4.1 Define home trade & foreign trade.
- 4.2 Describe types of home trade.
- 4.3 Differentiate between whole sale trade and retail trade.
- 4.4 Define foreign trade.
- 4.5 Mention the advantages and disadvantages of foreign trade.
- 4.6 Mention the classification of foreign trade.
- 4.7 Discuss the import procedure & exporting procedure.
- 4.8 Discuss the importance of foreign trade in the economy of Bangladesh.

5 Understand the basic concepts of communication

- 5.1 Define communication & business communication.
- 5.2 Describe the scope of business communication.
- 5.3 State the objectives of business communication.
- 5.4 Discuss the essential elements of communication process.

6 Understand the communication model and feedback.

- 6.1 Define communication model.
- 6.2 State the business functions of communication model.
- 6.3 Define feedback .
- 6.4 State the basic principles of effective feedback.
- 6.5 Explain the essential feedback to complete communication process.

7 Understand the types of communication.

- 7.1 Explain the different types of communication.
- 7.2 Distinguish between upward and downward communication.
- 7.3 Define two-way communication.
- 7.4 Describe the advantages and disadvantages of two-way communication.
- 7.5 Define formal & informal communication.
- 7.6 Describe the advantages and disadvantages of formal & informal communication.
- 7.7 Distinguish between formal and informal communication.

8 Understand the methods of communication.

- 8.1 Define communication method.
- 8.2 Discuss the various methods of communication.
- 8.3 Describe the advantages and disadvantages of oral communication.
- 8.4 Describe the advantages and disadvantages of written communication.
- 8.5 Distinguish between oral and written communication.

9 Understand the essentials of communication.

- 9.1 Discuss the essential feature of good communication.
- 9.2 Describe the barriers of communication.
- 9.3 Discuss the means for overcoming barriers to good communication.

10 Understand the report writing.

- 10.1 Define report , business report & technical report.
- 10.2 State the essential qualities of a good report.
- 10.3 Describe the factors to be considered while drafting a report.
- 10.4 Explain the components of a technical report.
- 10.5 Distinguish between a technical report and general report.
- 10.6 Prepare a technical report.

11 Understand the office management.

- 11.1 Define office and office work.
- 11.2 State the characteristics of office work.
- 11.3 Define filing and indexing.
- 11.4 Discuss the methods of filing.
- 11.5 Discuss the methods of indexing.
- 11.6 Distinguish between filing and indexing.

12 Understand the official and semi-official letters.

- 12.1 State the types of correspondence.
- 12.2 State the different parts of a commercial letter.
- 12.3 Define official letter and semi-official letter.
- 12.4 Distinguish between official letter and semi-official letters.
- 12.5 Prepare the following letters: Interview letter, appointment letter, joining letter and application for recruitment. Complain letters, tender notice.