

## Credit Based Semester System (2012-13 onwards)

### V SEMESTER B.SC. – COMPUTER SCIENCE

#### Paper V : CS301 - Microprocessor Architecture And 8086 Programming

#### Detailed Syllabus

| Topic   | Book   | Chapter   |
|---|--------|---|
| <b>UNIT –I</b>  |        |   |
| <b>Basic Computer Organization and design:</b> Instruction codes; Computer registers; Computer Instructions; Timing and Control; Instruction cycle; Memory reference instructions; I/O and Interrupt.   | Book 1 | 5.1, 5.2, 5.3 (exclude Table 5.2 & its explanations, <b>instruction set completeness</b> ), 5.4 ( <b>Exclude figure 5.7 and its related explanations</b> ), 5.5 (exclude <b>description of Register transfers for the fetch phase and the logic diagram, flow chart for instruction cycle</b> , Table 5.3 & its explanations), 5.6 (exclude <b>Description of individual instructions and control flowchart</b> ), 5.7 ( <b>exclude program interrupt and its flowchart</b> ) |
| <b>Memory Devices and Organization:</b> Memory Unit; Memory Hierarchy; Main Memory; Auxiliary Memory; Associative Memory; Cache Memory; Virtual Memory.   | Book 1 | 2.7( <b>Exclude fig 2.11 and its explanation</b> ), 12.1, 12.2( <b>Exclude Memory connection to CPU and Fig 12.4</b> ), 12.3, 12.4( <b>Exclude Match logic, Read operation, Write operation</b> ), 12.5, 12.6( <b>include Only Definition</b> )   |
| <b>UNIT –II</b>   |        |   |
| <b>Architecture of 8086:</b> Microprocessors; 8086: Internal Architecture; Memory Organization; Input and Output Structure; Programmable Hardware Registers; Addressing Modes; Levels of Programming.   | Book 2 | 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9  |
| <b>Assembler Directives:</b> Symbols, Variables and Constants; Data Definition and Storage Allocation Directives; Program Organization Directives; Alignment Directives; Program End Directive; Value-Returning Attribute Directives; Procedure Definition Directives; Macro Definition Directives; Data Control Directives; Branch Displacement Directives; Header File Inclusion Directives; Target Machine Code Generation Control Directives. | Book 2 | 2.1 to <b>2.12</b>  |
| <b>UNIT –III</b>  |        |   |
| <b>80x86 Instructions:</b> Introduction; Assembler Instruction Format; Data Transfer Instructions; Arithmetic and Logical Instructions; Branch Instructions; Processor Control Instructions; String Operation Instructions.   | Book 2 | 3.1, 3.2, 3.3, 3.4 (exclude IMUL, IDIV), 3.5 (exclude BOUND, ENTER, LEAVE), 3.6 (exclude WAIT, LOCK), 3.7 (exclude INS, INSB, INSW, OUTS, OUTSB, OUTSW)   |
| <b>Assembly Language Programming:</b> Introduction; Program Segments; Procedures; Program Structure;  | Book 2 | 4.1, 4.2(exclude example segment program), 4.3, 4.4, 4.5, 4.6, <b>4.7</b>   |

|   |        |   |
|---|--------|---|
| Programming with Macros; Input-Output Structure and Programming; Program Development Tools.   |        |   |
| <b>UNIT –IV</b>   |        |   |
| <b>Software Interrupts in C:</b> Introduction; Interrupt Interface Calls – Parameters to Interface Functions, Function: int86, Function: int86x, Function: intdos, Function: intdosx, Function: intr, Function: getinterrupt; Inline Assembly Language Programming; Mixed Language Programming – Procedure Calling Conventions: C Language Conventions. | Book 2 | 5.1, 5.2, 5.3, 5.4  |
| <b>Interrupts and Interrupt Service Routines:</b> Introduction; 8086 Interrupts and Interrupt actions; How does an Interrupt Work?; Interrupts and ROM-BIOS Services, Hardware or Exception Interrupts (INT 00H,INT 01H,INT 02H only); System Calls (Software Interrupts- DOS interrupts- INT 20H , INT21H only).                                       | Book 2 | 6.1, 6.2, 6.3, 6.4( <b>Include any two interrupts of table 6.1, table 6.2, table 6.3</b> ) , 6.5( exclude from INT 03H to INT 0EH), 6.6( exclude from INT10 H to INT 1Ch) |

**Text books:**

Book 1. M. Morris Mano, **Computer System Architecture**, PHI Publication (For Unit I: Chapters 2-7, 5-1 to 5-7, 12-1 to 12-6).

Book 2. K. R. Venugopal, Rajkumar, **Microprocessor x 86 Programming**, BPB Publications. (For Units II, III, and IV: Chapters 1.3 to 1.9, 2, 3, 4, 5, 6).

**Reference books:**

1. Yu-Cheng Liu, Glenn A. Gibson, **Microcomputer Systems: The 8086/8088 Family**, PHI Publication.

2. Udaya Kumar, Umashankar, **Advanced Microprocessor and Assembly Language Programming**, BPB Publication.

## Credit Based Semester System (2012-13 onwards)

### Paper VI : CS302 - Database Concepts and Oracle

#### Detailed Syllabus

| Topic   | Book   | Chapter  |
|---|--------|--|
| <b>UNIT –I</b>  |        |  |
| <b>Database System Concepts</b> and Architecture, History of Database Systems, Database Systems versus File Systems. Data Abstraction, Data independence, Schemas and Instances, Data models, Database Languages, Database Users, DBA. Structure of Database Systems.   | Book 1 | Chapter 1  |
| The database system environment, Centralized and Client/Server Architecture for DBMSs, Classification of DBMSs  | Book 2 | Chapter 2.4, 2.4.1 to 2.4.3, 2.5.1 to 2.5.4, 2.6 |
| Entity types, attributes, keys, relationships, Relationship types, roles and structural constraints, Weak entity sets. Data Modeling using E-R Models.  | Book 2 | Chapter 3.1 to 3.7                               |
| <b>UNIT –II</b>   |        |  |
| <b>Relational model:</b> Basic Concepts of relational data model<br>Relational Algebra, Basic and additional operations of relational algebra.<br>Simple queries using relational algebra.  | Book 2 | Chapter 5<br>Chapter 6.1 to 6.3.2,<br>6.4.1 ,6.5 |
| <b>Design theory of Relational Database:</b> Introduction to Relational database design, Functional dependency, and Normal forms based on Primary Keys. Normal forms (1NF, 2NF, 3NF and BCNF), Armstrong Inference rules.   | Book 2 | Chapter 10.1to 10.5                              |
| <b>Recovery Techniques:</b> Recovery Concepts.  | Book 2 | Chapter 17.1 to 17.3,<br>19.1.1                  |
| <b>UNIT –III</b>  |        |  |
| <b>Introduction to Oracle: Creation of Database:</b> Creating, changing and dropping the tables. Integrity Constraints specification, maintaining reference integrity constraints, Data insertion, deletion and modification.   | Book 3 | Chapters 1 & 2                                   |
| <b>Querying the database:</b> Information retrieval using SELECT statement, Various features of SELECT statement, Aggregate functions, ORDER BY clause, Working with expressions and sub queries, Handling of multiple tables.  |        |  |
| <b>UNIT –IV</b>   |        |  |
| <b>PL/SQL Basics:</b> Introduction, PL/SQL execution environment, PL/SQL syntax, Block structure, Conditional statements, iterative statements, Oracle transactions.<br><b>Cursors-</b> Definition, use, declaring, opening, fetching and closing of cursor, cursor attributes implicit and explicit cursor.<br><b>Functions:</b> Definition, creation, execution and syntax of function, an application using a function.<br><b>Procedures:</b> Definition, creation, execution and syntax of procedures, an application using a procedure, deleting a procedure.<br><b>Database triggers:</b> Definition, uses, comparison with procedures, constraints, parts of triggers, types of triggers, syntax, deleting a trigger, applications using triggers. | Book 3 | Chapters 3, 4, 5, 6                              |

|  |                  |                  |
|--|------------------|------------------|
| <b>Packages:</b> Creation and use of packages. | Ref<br>Book<br>1 | Page No. 413-419 |
|--|------------------|------------------|

**Text Books :**

Book 1. Silberschatz and Korth, **Database System Concepts**, McGraw Hill Publication. (Chapter 1).

Book 2. Elmasri and Navathe , **Fundamentals of Database Systems**, Pearson Education Asia Publication, 4<sup>th</sup> edition. (Chapter 2, 3.1 to 3.7,5,6,10, 17.1 to 17.3 19.1)

Book 3. Ivan Bayross, **Commercial Application Development using Oracle D2K**, BPB Publications (Chapters 1, 2, 3, 4, 5, 6)

**Reference Books :**

1. Ivan Bayross, **SQL, PL/SQL The programming Language**, BPB Publications

2. Scott Urman, **Oracle 8 PL/SQL Programming**, Tata McGraw Hill Edition

**V SEMESTER B.Sc. COMPUTER SCIENCE**  
**REVISED SCHEME OF PRACTICAL EXAMINATION**  
**(2 CREDITS)**

**From 2014-15 onwards**

**Examination duration: 4 Hours**

**Max. Marks: 80**

**Qn. No. 1:** Part A- 8086 numerical program

**OR**

Part A- Oracle Table Creation and SQL queries -20 marks

**Qn. No. 2:** Part B 8086 – String Manipulation program -25 marks

**Qn. No. 3:** Part C PL/SQL program -25 marks

**Record:** PART A- 8086 Numerical Programs & Part A Oracle SQL queries

PART B: 8086 String Manipulation Programs

PART C: PL/SQL Programs -10 marks

**INTERNAL ASSESSMENT – 20 MARKS**

(Based on the marks obtained in one Internal Practical Examination and Continuous Evaluation)

**III B.Sc. (V SEMESTER)**  
**CS-303: Microprocessor and Oracle Practical**  
**MICROPROCESSOR 8086 PROGRAMMING**

**PART A – NUMERICAL PROGRAMS**  
**(20 marks)**

1. Write an ALP to count the number of logical 1's & 0's in a given byte.
2. Write an ALP to find the factorial of a number (byte).
3. Write an ALP to add two BCD numbers.
4. Write an ALP to find the smallest and largest in an array of bytes.

**PART B – STRING MANIPULATION PROGRAMS**  
**(25 marks)**

5. Write an ALP to Reverse a string and check whether it is a palindrome.
6. Write an ALP to Search a character in a string and display relevant result.

7. Write an ALP to Compare two strings and check whether they are identical or not.
8. Write an ALP to Convert uppercase characters to lower case and vice versa in a given string containing upper and lower case characters, as well as some special characters.

## ORACLE PRACTICAL EXERCISES

### PART A – Table Creation & SQL queries (20 marks)

1. Create a table EMPLOYEE with the following columns :

| Column | data type | Constraint                                    |
|--------|-----------|---|
| ENO    | number    | Constraint NOT NULL and PRIMARY KEY           |
| ENAME  | varchar2  | Constraint NOT NULL                           |
| DEPT   | varchar2  | Constraint NOT NULL                           |
| BASIC  | number    | Constraint Basic $\geq 5000$ and $\leq 45000$ |

Insert 5 records to the table.

Alter the table to add the columns DA, HRA, GrossPay, PF, PT and Netpay and calculate the DA, HRA, GrossPay, PF, PT and Netpay as follows:

DA = 80% of BASIC if BASIC <20000

= 70% of BASIC otherwise

HRA= 10% of BASIC,

GrossPay= BASIC+DA+HRA

PF = 2 % of BASIC and PT=5% of BASIC

Netpay = GrossPay-(PF+PT)

Write the SQL statements for the following:

- a) Display the details of all the Employees.
- b) Display the names of employees of Finance department.
- c) Display the names of all the employees in alphabetical order.
- d) Display the Department name, name of employees who are getting maximum and minimum Netpay in each department.
- e) Display the name and Netpay of all the employees in decreasing order of their Netpay.
- f) Display the details of the all employees whose Netpay is in between 15000 and 35000.
- g) Display the name and basic of the employees whose name contains KUMAR.
- h) Display the name and basic of the employees whose name ends with 'th'.
- i) Count the number of employees in each department.
- j) Delete all the employees of Accounts department.

**While inserting records note the following:**

: Enter department names such as Accounts, Finance, Education, etc.

: Enter Designation like Manager, Supervisor, Clerk, Attendeder, etc.

: Also enter some employee names ending with 'Kumar', 'th', etc.

2. Create the following tables by identifying primary and foreign keys. Specify the **not null** property for mandatory keys.

SUPPLIERS ( Supplier\_no, Sname, Saddress Scity)

COMPUTER\_ITEMS (Item\_No, Supplier\_no, Item\_name, Iquantity)

Insert 5 Records into both the tables and execute the following queries.

- a. List item and supplier details.
- b. List the names of the suppliers who are supplying the Keyboard.
- c. Display the items supplied by Microtech.
- d. List the items supplied by the suppliers Cats and Electrotech.
- e. List the name of the suppliers and items whose quantity is more than 10.

3. Create table Department with fields Deptno Varchar2(3) must begin with 'D', Dname Varchar2(20). Dname must be Accounts, Purchase, Sales or Service. Impose Primary Key on Deptno.

Create another table Emp with fields Eno Number(5), Ename Varchar2(15) Not Null, Deptno Varchar2(3) referencing the Department table, Salary Number(10,2). Impose Primary Key on Eno.

Insert 5 records each to both the tables and execute the following queries.

- a. Update the salary of employees by 20% in the department of Sales and Service.
- b. Display the name of employees working in the departments of Accounts, Purchase and Sales.
- c. Display the name of employees working in the department of Purchase or Sales having salary>20000.
- d. Display the name of the departments which are not having any employees.

4. Create Item\_Master table with the fields Itemno having Primary key and must begin with letter 'I', Item\_Name(HDD, MONITOR, CDROM, KEYBOARD, UPS), Stock defined as Not Null and Price which is greater than 10000 and less than 30000.

Create another table Item\_Trans with the fields Itemno referencing the Item\_Master table, Quantity greater than 25 and Trans\_Date.

Insert 5 records to each of the tables and execute the following queries.

- a. Display all the records from the Item\_Master table.
- b. List the Item\_Name whose Stock is less than 100
- c. List the Item\_Name and the Stock where Price lies between 2500 and 25000.
- d. Display the Itemno, Item\_Name and the Quantity where Quantity>=100
- e. Display the amount where amount=Price\*Quantity with Amount as new column heading.
- f. Display the Itemno, Item\_Name, Quantity, Trans\_date where the transaction date greater than March 2008.

**(Note: Minimum of 5 records must be inserted in each table.**

**Any five queries to be asked in the examination)**

## PART C – PL/SQL Exercises

(25 marks)

5. Write a PL/SQL program to accept the students rollno, name and their marks in 3 subjects from a base table Student (having RollNo, Sname, Marks in three subjects) and declare the result based on the following rules:

- i). If student has scored below 35 in any subject he/she is declared as FAIL.
- ii). If the Total  $\geq 180$  then declare the result as I CLASS
- iii). If the Total  $\geq 150$  but  $< 180$  then declare the result as II CLASS
- iv). If the Total  $< 120$  then declare the result as III CLASS.

Assume the records of 5 students. Create an output which contains the roll number, name of the student, marks in 3 subjects, total mark and result in the following format.

```
=====
ROLLNO  NAME           MARK1  MARK2  MARK3  TOTAL  RESULT
=====
.....  .....          ....   ...    ....   ....   .....
=====
```

6. Given the following tables

ITEM\_MASTER (Item\_No, Item\_Name, Stock, Unit\_Price)

ITEM\_TRANS (Item\_No, Qty, Trans\_Date)

Write a function to check whether the item exists in ITEM\_MASTER. Write a main program such that if the function returns a value 1, add a record to ITEM\_TRANS with a given Item\_No, Qty and today's date as Trans\_Date, otherwise display an appropriate error message.

7. Create a package which includes a function to compute the factorial of a number, a procedure to compute the value of  $nCr$ , and another procedure to compute  $nPr$  both uses the factorial function. Execute the package program for the required calculation.

8. Create a trigger to update the MASTER table when a record is inserted into SALES table and create another trigger to update the MASTER table when a record is inserted or updated or deleted in NEWSTOCK table. Assume the suitable columns for all the tables.

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