Bachelor of Computer Applications

Syllabus for the Students admitted in Session 2019-20

SEMESTER – III:

Paper No.	Paper	M. Marks
Paper–I	Computer Architecture	75
Paper–II	Database Management System	75
Paper–III	Introduction to Python Programming	75
Paper–IV	Programming Lab – Python	50
Paper–V	Programming Lab – Oracle	25

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Paper – I: COMPUTER ARCHITECTURE

Time: 3 Hours **M. Marks: 75**

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A

Information Representation: Register Transfer Language, Various Registers, Implementing Common Bus Using Multiplexers: Logical; Arithmetic & Shift Micro – operations.

Basic Computer Design Instruction Codes, Computer Instructions, Timing Signals, Instruction Cycle, Design of a Basic Computer.

Section B

CPU Design General Register Organization, Stack Organized CPU, Instruction Formats, Addressing Modes, Program Control, Hardwired & Microprogrammed (Wilhe's Design) Control Unit, RISC and CISC Characteristics.

Section C

Memory Organization Memory Hierarchy, Designs & Concepts of Main Memory, Auxiliary Memory, Associative Memory, Cache and Virtual Memory.

Section D

I/O Organization I/O Interface, Modes of Transfer, Program Interrupt, DMA & I/O Processor.

Pipeline & Vector Processing Introduction to Parallel Processing and Pipelining, SISD, SIMD & MISD, MIMD Machines.

References:

Computer System Architecture: M.M. Mano (PHI)
Computer Architecture: J.P. Hayes.
Computer Architecture: Patterson & Hemessy.

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Paper – II: DATABASE MANAGEMENT SYSTEM

Time: 3 Hours **M. Marks: 75**

Instructions for the Paper Setters:-

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Section A

Introduction to Data, Field, Record, File, Database, Database management system. Structure of database system, Advantage and disadvantage, levels of database system, Relational model, hierarchical model, network model, comparison of these models, E–R diagram, different keys used in a relational system, SQL.

Section B

DBA, responsibilities of DBA, Relational form like INF, 2NF, 3NF, BCNF, 4^{th} NF, 5^{th} NF, DBTG, concurrency control and its management, protection, security, recovery of database.

Section C

SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Built in Functions, Views, Security amongst users, Sequences, Indexing Cursors– Implicit & Explicit, Functions & Packages Database Triggers.

Section D

Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL

Books and References:

1. Introduction to Database System by C.J. Date.
2. Database Management System by B.C. Desai.
3. Database Concept by Korth.
4. Simplified Approach to DBMS– Kalyani Publishers
5. Oracle – Developer – 2000 by Ivan Bayross.
6. Database System Concepts & Oracle (SQL/PLSQ) – AP Publishers.
7. https://www.mongodb.com/nosql-explained
8. Introduction to NoSQL (Ebook), NoSQL Seminar 2012 @ TUT, Arto Salminen

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Paper III: Introduction to PYTHON Programming

Time: 3 Hrs. **M. Marks: 75**

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section A

Introduction to Python: Python's Technical Strengths, Execution Model, Process of Computational Problem Solving, Different ways to run Python Programs.

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Strings, Statements and Data Types, Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging

Lists & Dictionaries: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python, Dictionaries and Files, Looping and dictionaries, Advanced text parsing

Section B

Control Structures: Conditional blocks using if, else and elif,While statement, Definite loops using For, Loop Patterns,

Functions, Packages and Modules: Fundamental Concepts, Program Routines, Flow of Execution, Parameters &Arguments, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion, Understanding Packages, Modules, Top-Down Design, Python Modules Importing own module as well as external modules and packages.

Section C

Files: Opening Files, Using Text Files, Reading files, Writing files, Understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Manipulating file pointer using seek, String Processing, Exception Handling

Objects and Their Use: Introduction to Object Oriented Programming, Concept of class, object and instances, Constructor, class attributes and destructors, Real time use of class in live projects, Inheritance, overlapping and overloading operators, Adding and retrieving dynamic attributes of classes, Programming using Oops support

Section D

Using Databases and SQL: Database Concepts, SQL basic summary, SQL Database connection using python, creating and searching tables, Programming using database connections, Basic Data modelling, Programming with multiple tables

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Paper – IV

(Programming Lab-I)

Lab – I: Based on Python Programming Language : 50 Marks

Paper – V

(Programming Lab-II)

Lab – II: Practical in Oracle : 25 Marks