Exam. Code : 107203
Subject Code : 1789

Bachelor of Computer Application (BCA)

3rd Semester

COMPUTER ARCHITECTURE

Paper—I

Time Allowed—3 Hours] [Maximum Marks—75

Note :— (1) The candidates are required to attempt **five** questions, selecting at least **one** question from each Section. The **fifth** question may be attempted from any Section.

(2) All questions carry **15** marks each.

(3) The students can use only non-programmable non-storage type calculator.

SECTION—A

1. (a) Explain implementing Common Bus with Multiplexers using Logical, Arithmetic and Shift micro operations. 7.5

(b) Draw the block diagram of dual 4 to 1 line multiplexers and explain its operation by means of a functional table. 7.5

2. (a) Draw and explain the flowchart of floating point addition process. 7.5

(b) State the Non-restoring division technique. 7.5

SECTION—B

3. (a) Explain the different addressing modes in detail. An instruction is stored at location 300 with its address field at location 301. The address field has the value 400. A processor registers R1 contains the number 200. Evaluate the effective address for the different addressing modes. 7.5

(b) A relative mode branch type of instruction is stored in memory at an address equivalent to decimal 750. The branch is made to an address equivalent to decimal 500.

(i) What should be the value of the relative address field of the instruction (in decimal) ? Determine the relative address value in binary using 12 bits. (Why must the number be in 2's complement ?)

(ii) Determine the binary value in PC after the fetch phase and calculate the binary value 500. Then show that the binary value in PC plus the relative address calculated in part (a) is equal to the binary value of 500. 7.5

4. (a) What is microprocessor ? Is it possible to design a microprocessor without a micro-programmed ? Also discuss the classification of microprocessor in detail. 7.5

(b) Explain Stack Organization in detail. 7.5

SECTION—C

5. (a) What do you mean by virtual memory ? Discuss how paging helps in implementing virtual memory. 7.5

(b) Explain the cache memory and its accessing methods in detail. And how these methods are used to improve cache performance. How many total bits are required for a direct mapped cache with 16 KB of data and 4 word blocks, assuming a 32 bit address ? 7.5

6. What is Memory Interleaving ? Explain the addressing of multiple module memory system. 15

SECTION—D

7. Explain with the block diagram the DMA transfer in a computer system. 15

8. Explain how the instruction pipeline works. What are the various situations where an instruction pipeline can stall? What can be its resolution ? In certain scientific computations it is necessary to perform the arithmetic operation $(A_i + B_i)(C_i + D_i)$ with a stream of numbers. Specify a pipeline configuration to carry out this task. List the contents of all registers in the pipeline for i = 1 through 6. 15

Exam. Code : 107203
Subject Code : 1790

Bachelor of Computer Application (BCA)
3rd Semester
DATABASE MANAGEMENT SYSTEM
Paper—II

Time Allowed—3 Hours] [Maximum Marks—75

Note :— Attempt ***five*** questions, selecting at least ***one*** question from each Part. The **fifth** question may be attempted from any part.

PART—A

1. (a) List five responsibilities of the database manager for each responsibility, explain the problems that would arise if the responsibility were not discharged. 8
   (b) Compare the features of Network, Hierarchical and Relational model. 7
2. (a) Discuss the three level architecture of database management system. Explain the various types of different levels of database architecture. Explain. 8
   (b) Discuss about the components of ER Model. Give an example. 7

PART—B

3. (a) What is Normalization ? Explain the various types of normal forms with example. 8
   (b) What do you mean by recovery of database ? Discuss the various mechanisms used for the recovery of database. 7

4. (a) What are various methods of concurrency control ? Explain in detail two phase locking protocol. 8

(b) Explain the five main responsibilities of database administrator. 7

PART—C

5. (a) Discuss the use of selection and join operators on SQL based queries. 8

(b) What are triggers ? Also explain the use of triggers in database. 7

6. (a) How would you use the features of nested queries in SQL to develop complex queries ? Give examples. 8

(b) Write short notes on the following terms :

(i) DDL

(ii) DCL. 7

PART—D

7. (a) What is Big Data ? List down various applications of Big Data. 8

(b) Explain the five V's of Big Data. 7

8. Write detailed notes on the following :

(a) No SQL

(b) Data Analytics. 15

Exam. Code : 107203
Subject Code : 8143

Bachelor of Computer Application (BCA) 3rd Semester
(Old Sylb 2018)

COMPUTATIONAL PROBLEM SOLVING USING PYTHON

Paper—III

Time Allowed—3 Hours] [Maximum Marks—75

Note :— Attempt any **FIVE** questions. All questions carry equal marks.

1. (a) Discuss any five application areas of Python. 5
   (b) Differentiate Variables and Identifiers. 5
   (c) Discuss the use of logical operator by taking suitable example. 5
2. (a) Write a program to find smallest among three integers. 7.5
   (b) What are different steps involved in Python debugging ? Explain. 7.5
3. (a) What are different list sequences ? Explain by taking suitable example. 7.5
   (b) Write a program to find count of even and odd numbers from a list of numbers. 7.5
4. Discuss the flow of execution of a Python function. Write a program to find factorial of a number using function. 15

5. (a) Write a program to perform matrix multiplication. 7.5

(b) How Python carries out Advanced Text Parsing ? Explain. 7.5

6. Explain the following concepts :

(a) Exception Handling 5

(b) Object Orientation 5

(c) Modular Design 5

7. (a) Differentiate top-down and bottom-up approach of modular programming. 7.5

(b) What is meant by package in Python ? Explain. 7.5

8. Explain the following concepts with respect to SQLite :

(a) Connecting to a Database 5

(b) Creating a table 5

(c) Inserting a record. 5

Exam. Code : 107203
Subject Code : 1791

Bachelor of Computer Application (BCA) 3rd Semester

INTRODUCTION TO PYTHON PROGRAMMING

Paper—III

Time Allowed—Three Hours] [Maximum Marks—75

Note :—Attempt **FIVE** questions, selecting at least **ONE** question from each section. The **fifth** question may be attempted from any section.

SECTION—A

1. Python is a powerful language. Which features of the language make it powerful ? 15

2. List the operators that Python supports. Explain the relational and logical operators along with their precedence while evaluating an expression. 5,10

SECTION—B

3. Describe the structure of a conditional statement. Write a program using conditional statements to find out discounted price for an item depending upon its category such as (a) seasonal-food-items with expiry date in a month at 10%, and otherwise 5%; (b) seasonal-clothes with sizes extra-small, or extra-extra-large at 20%, and otherwise 5%. 5,10

4. Write down the different ways to create the List sequence type. 15

SECTION—C

5. Write short notes on (a) debugging, (b) exception handling. 7.5,7.5

6. (a) What is a class ? How it different from an object ? Give examples. 8

   (b) Describe the role of constructors and destructors. 7

SECTION—D

7. Why is using a database better than using files ? Create a database to store information about employees of an organization working in different departments (located in different cities) who draw weekly salary as per their designation and experience. Indicate the primary and foreign keys. 5,10

8. What is a module ? Why are modules used ? How are they used ? 15