MASTER OF COMPUTER APPLICATIONS (MCA)

MCA/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2016 & January - 2017)

MCS-021, MCS-022, MCS-023, MCS-024, MCSL-025

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068

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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.

2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to MCA Programme Guide.

3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the MCA Programme Guide.

4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	**MCS-021**
Course Title	:	**Data and File Structures**
Assignment Number	:	**MCA(2)/021/Assignment/16-17**
Maximum Marks	:	**100**
Weightage	:	**25%**
Last Dates for Submission	:	**15th October, 2016 (For July 2016 Session)**
		15th April, 2017 (For January 2017 Session)

This assignment has four questions which carry 80 marks. Answer all the questions. Each question carries 20 marks. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide. All the implementations should be in C language.

1. Write an algorithm for the implementation of a Tree.   *(20 Marks)*

2. Implement multiple stacks in a single dimensional array. Write   *(20 Marks)*
algorithms for various stack operations for them.

3. Write a note of not more than 5 pages summarizing the latest   *(20 Marks)*
research in the area of "Searching Techniques". Refer to various
journals and other online resources. Indicate them in your
assignment.

4. What is a B-Tree? Write a short note on its applications.   *(20 Marks)*

Course Code   **:**   **MCS-022**

Course Code   **:**   MCS-022
Course Title   **:**   **Operating System Concepts and Networking Management**
Assignment Number   **:**   **MCA(2)/022/Assignment/16-17**
Maximum Marks   **:**   **100**
Weightage   **:**   **25%**
Last Dates for Submission   **:**   **15ᵗʰ October, 2016 (For July 2016 Session)**
                                             15ᵗʰ April, 2017 (For January 2017 Session)

This assignment has eight questions. Answer all questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Answer of each part of the question should be confined to about 300 words. Make suitable assumption is necessary.

1. (a) Differentiate between Microkernel architecture and Kernel architecture?   *(5 Marks)*

     (b) Define Distributed File System? Explain how it is implemented in Windows 2000?   *(5 Marks)*

2. (a) Explain the differences between the following groups of Windows 2000 operating system: *(6 Marks)*

         (i)   Global groups
         (ii)   Domain Local groups
         (iii) Local groups
         (iv) System groups

     (b) Explain the role of NAME SERVERS and RESOLVERS in DNS Architecture.   *(4 Marks)*

3. (a) Explain the abstract model of Virtual Memory used in Linux operating system. Give a suitable diagram to explain its working.   *(6 Marks)*

     (b) Write a shell script in LINUX to count the number of words in a given file.   *(4 Marks)*

4. (a) Which application layer protocol is used by network management frameworks to manage and monitor network devices? Explain its architecture and working.   *(6 Marks)*

     (b) Explain drive mapping facility in Windows 2000 with suitable examples.   *(4 Marks)*

5. (a) Mention the usage of following LINUX commands with an example of each :   *(4 Marks)*

  - tail
  - grep
  - chmod
  - sort

   (b) Compare the individual fields of the IPV4 leader with the IPV6 header.   *(6 Marks)*

6. (a) Explain the Logical and Physical structure of active directory in Windows 2000.   *(5 Marks)*

   (b) Describe the concept of encrypting using EFS services.   *(5 Marks)*

7. (a) Assume you are server administrator of Linux lab. This lab is having two computers which are having some confidential data. We want to display a logon warning message, "unauthorized access to this system is punishable" if any user tries to log in these two computers with wrong user name or wrong password. Write the steps to create the above mentioned logon warning message.   *(6 Marks)*

   (b) Draw a diagram of SNMP architecture and show how it is used to manage network devices.   *(4 Marks)*

8. (a) How does the Remote Access Mechanism in Windows 2000 work and how can it be configured ?   *(6 Marks)*

   (b) Explain the following with reference to WINDOWS 2000:   *(4 Marks)*

     (i) File Replication service
     (ii) FAT 16 and FAT 32

Course Code	:	MCS-023
Course Title	:	**Introduction to Database Management Systems**
Assignment Number	:	**MCA(2)/023/Assignment/16-17**
Maximum Marks	:	**100**
Weightage	:	**25%**
Last Dates for Submission	:	**15ᵗʰ October, 2016 (For July 2016 Session)**
		15ᵗʰ April, 2017 (For January 2017 Session)

This assignment has five questions of 80 marks. Rest 20 marks are for viva voce. Answer all questions. You may use illustrations and diagrams to enhance your explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Answer to each part of the question should be confined to about 300 words.

1. List and describe briefly all the possible applications of a database management system in any IGNOU's Regional Centre? *(15 Marks)*

2. Identify all the associated entities for a ***Regional Centre Management System***, their corresponding attributes, relationships and cardinality and design an Entity-Relationship (ER) diagram for it. *(20 Marks)*

3. Consider the E-R diagram of ***Question 2*** and design the tables. Perform and show the Normalization till the required normal form. Implement the database using MS-Access and submit the screenshots along with your assignment response for this question. *(20 Marks)*

4. Consider a "Library Management System" which has the following tables**:** *(15 Marks)*

Book(isbn_no, book_title, author1, author2, author3, publisher, edition, year_of_copyright, cost)
Book_Accession(accession_no, isbn_no, date_of_purchase)
Member(m_id, m_name, m_address, m_phone)
Issue_return (accession_no, m_id, expected_date_of_return, actual_date_of_return)

Please note that a member can be issued a book for a period of 15 days. The actual_date_of_return is kept blank for the books that have not been returned. Write and run the following SQL queries on the tables:

(i) Find the m_id and m_name of the members who have got maximum number of un_returned books.

(ii) List the book details whose year_of_copyright is 2014.

(iii) Find the names of all those students who have got all the books issued to him of the author named "ABC" .

(iv) Find the books whose cost is less than Rs.500/- and date_of_purchase is 2014.

(v) Find those members who have not got any book issued to him/her during last six months.

Note: Make suitable assumptions, if any.

5. Consider the Relation R={A, B, C, D, E, F, G, H } and the set of functional dependencies. *(10 Marks)*

A→C   B→CG   AD→EH   C→DF   A→H

What is the key for R? Decompose R into 2NF, 3NF and finally in BCNF relation.

Course Code	:	MCS-024
Course Title	:	Object Oriented Technologies and Java
Assignment Number	:	MCA(2)/024/Assignment/16-17
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2016 (For July 2016 Session)
		15th April, 2017 (For January 2017 Session)

There are eight questions in this assignment which carried 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. Also in your programs give appropriate comments to increase understandability. Please go through the guidelines regarding assignments given in the Program Guide for the format of presentation.

1. (a) What is Object Oriented Programming? Explain basic components of Object Oriented Programming . *(6 Marks)*

   (b) Explain abstraction and encapsulation with the help of examples. *(2 Marks)*

   (c) Explain concept of java virtual machine. *(2 Marks)*

2. (a) Write a java program to demonstrate use of different operators available in java. *(4 Marks)*

   (b) Explain followings in context of java, with the help of examples. *(6 Marks)*

   (i) Access specifiers and Inheritance
   (ii) Application program and Applet program

3. (a) Create array of objects in a java program and pass it as an argument in a method. *(2 Marks)*

   (b) Write a java program to demonstrate different use of **final** variable. *(2 Marks)*

   (c) Write a java program to create Ticket class with proper constructor, to create a railway ticket. Define a method to display ticket details. *(6 Marks)*

4. (a) What is polymorphism? It provides flexibility in application development? Yes or No? Justify your answer with the help of an example. *(3 Marks)*

(b)   Explain the need of package in Java. Explain accessibility rules for package. Also explain how members of a package are imported. Write java program to create your own package for finding area of different shapes   *(7 Marks)*

5. (a)   What is abstract class? Explain need of abstract class with the help of an example.   *(2 Marks)*

(b)   What is an exception? Explain haw an exceptions are handled in Java. Write a java program to handle different arithmetic exceptions while managing a medical store billing process.   *(8 Marks)*

6. (a)   What is I/O stream in java? Write a program in java to create a file and count the number of words in it.   *(4 Marks)*

(b)   Create an Applet program to display details of a quiz competition. Insert a background image in this program.   *(4 Marks)*

(c)   Write and explain different constructors of String class.   *(2 Marks)*

7. (a)   What is layout manager? Explain different layouts available in java for GUI programming. What is default layout of an Applet? Explain how to set the layout of an applet.   *(4 Marks)*

(b)   What is multithreading? Explain how threads are synchronized in java.   *(3 Marks)*

(c)   Explain the need of JDBC? Explain steps involved in connecting a databases using JDBC.   *(3 Marks)*

8. (a)   What is socket? Explain stream sockets and datagram sockets.   *(3 Marks)*

(b)   What is RMI? Explain RMI architecture.   *(3 Marks)*

(c)   What is servlet ? Explain servlet life cycle.   *(4 Marks)*

Course Code	:	**MCSL-025**
Course Title	:	**Lab Course**
Assignment Number	:	**MCA(2)/L-025/Assignment/15-16**
Maximum Marks	:	**100**
Weightage	:	**25%**
Last Dates for Submission	:	**31st October, 2015 (For July 2015 Session)**
		30th April, 2016 (For January 2016 Session)

This assignment has four parts. Answer all questions of each part. Each part is of 10 marks. Lab records of each part will carry 10 marks. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

PART-1: MCS-021

1. Write a program in C language for multiplication of two sparse matrices using Pointers *(5 marks)*

2. Write a program in C language that will accept a Graph as input and will perform a Depth First Search on it. Make necessary assumptions. *(5 marks)*

PART-2: MCS-022

1. Write a shell script in Linux/Unix that accepts a text file as input and prints the number of sentences in the file. *(5 marks)*

2. Your PC is on a network. Make necessary settings in your PC so that it can Print to a Printer that is on the Network of PC but not directly connected. *(5 marks)*

PART-3: MCS-023

1. Create a database consisting of Name of Study Center, Code of Study Center, Programmes offered at Study Center, Number of Students enrolled Programme Wise.After creating the database, perform the following tasks: *(10 marks)*

   (i) List the number of Students who are enrolled for MCA across all Study Centers

PART-4: MCS-024

1. Write a program in Java for the addition of two matrices. *(5 marks)*

2. Write a program in Java that connects to a database and generates a report consisting of the Programmes study center wise where the student enrollment is less than 50. Make assumptions wherever necessary. *(5 marks)*

Note: You must execute the program and submit the program logic, sample inputs and outputs along with the necessary documentation for this question. Assumptions can be made wherever necessary.