

MASTER OF COMPUTER APPLICATIONS (MCA)

MCA/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2015 & January - 2016)

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(II)/021/Assignment/15-16**
Maximum Marks : **100**
Weightage : **25%**
Last Dates for Submission : **15th October, 2015 (For July 2015 Session)**
15th April, 2016 (For January 2016 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 Dequeue. *(20 Marks)*

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

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

4. What are AVL trees? What are Red-Black trees? What are the differences between them? *(20 Marks)*

Course Code	:	MCS-022
Course Title	:	Operating System Concepts and Networking Management
Assignment Number	:	MCA(II)/022/Assignment/15-16
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2015 (For July 2015 Session) 15th April, 2016 (For January 2016 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 the significance of VPN? Name some VPN technologies supported by Windows 2000. *(5 Marks)*
- (b) Write step by step procedure to configure a Linux machine to work with a network file system. *(5 Marks)*

2. (a) List any two existing virus protection tools available today in the Market for Windows. Describe and compare its features. *(5 Marks)*
- (b) Describe the process of sharing network in Linux and Windows 2000. *(5 Marks)*

3. (a) What are the strategies followed in Windows 2000 for backup? *(5 Marks)*
- (b) What are the contents of Password files and where are they located in Windows? Also, explain the concept of Shadow passwords? *(5 Marks)*

4. (a) Name the various methods of authentication available in the Windows 2000 operating system. *(5 Marks)*
- (b) How would you set the IP address of a LAN card in LINUX? *(5 Marks)*

5. (a) Write a shell script that searches the file contents in a directory and its sub-directories for a text string given by the user. It list all such file names having that given string and store in a temp file "search_temp". It should have user friendly messages e.g. "File does not exist" , "Do you want to search again", etc. *(10 Marks)*

6. (a) How Linux and Windows 2000 manage the domains? Also, explain how trust relationship is created and managed between domains in Windows 2000? *(10 Marks)*
7. (a) Compare FAT 16 and FAT 32 file systems. *(5 Marks)*
(b) Discuss the features of GNOME configuration tool. *(5 Marks)*
8. (a) Explain the role and importance of following tools for quota management in Linux. *(5 Marks)*
(b) List and describe the various security features in Linux. *(5 Marks)*

Course Code : **MCS-023**
Course Title : **Introduction to Database Management Systems**
Assignment Number : **MCA(II)/023/Assignment/15-16**
Maximum Marks : **100**
Weightage : **25%**
Last Dates for Submission : **15th October, 2015 (For July 2015 Session)**
15th April, 2016 (For January 2016 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. Construct an ER diagram for an Event Management System. *(20 Marks)*
Clearly indicate the entities, relationships, cardinality and the key constraints. Also, derive the unnormalized relational database tables with the help of this diagram.

2. Normalize the tables designed in Q1 till its requirements are satisfied. *(20 Marks)*

3. Consider the following EMP table: *(1 x 15 = 15 Marks)*

ENAME	DEPT-NAME	DESIGNATION	SALARY	DATE-OF-JOIN
KARAN	ACCOUNTING	DIRECTOR	50000	Nov 17, 2012
FARAH	RESEARCH	ANALYST	30000	Dec 03, 1991
SCINDIA	RESEARCH	ANALYST	30000	Dec 09, 2002
JOY	RESEARCH	MANAGER	29750	Apr 02, 2011
BHASKAR	SALES	MANAGER	28500	May 01, 1999
CHANDER	ACCOUNTING	MANAGER	24500	Jun 09, 2000
ANIL	SALES	SALESMAN	16000	Feb 20, 1991
TOMAR	SALES	SALESMAN	15000	Sep 08, 2001
MILIND	ACCOUNTING	CLERK	13000	Jan 23, 2002
SAXENA	SALES	SALESMAN	12500	Sep 28, 1999
TOMAR	SALES	SALESMAN	14500	Feb 22, 1997
ANAND	RESEARCH	CLERK	11000	Jan 12, 1993
GEORGE	SALES	CLERK	9500	Dec 03, 1990
SURESH	RESEARCH	CLERK	8000	Dec 17, 1992

Answer the following queries in SQL.

- (i) Find all the ENAME's whose salary is < Rs.20000
 - (ii) Find all the employees working with SALES Department and with designation MANAGER
 - (iii) Find all employees whose name starts with S.
 - (iv) Find total number of employees who work with RESEARCH department.
 - (v) Find all the employees who joined after Jan 1, 2010.
 - (vi) Count number of employees whose salary is between Rs.8000 and Rs.12500.
 - (vii) Sort the supplier table by ENAME.
 - (viii) Find the employees whose designation is SALESMAN and joined after 1st Aug, 1990.
 - (ix) Find all the employees whose designation is CLERK.
 - (x) Count number of SALESMAN in SALES department
 - (xi) Count all the number of employees who are working with the company.
 - (xii) Find S# of supplier who supply part 'p2'
 - (xiii) Find the employees joined between 1st Jan, 1997 and 31st Dec, 2010.
 - (xiv) Sort the table by the SALARY, descending order.
 - (xv) Find the employees with similar names and display their designation, department and data of join.
4. (a) Discuss the advantages and disadvantages of hierarchical database management system in comparison with RDBMS. Discuss types of applications suitable for hierarchical DBMS and RDBMS. (5 Marks)
- (b) Define the two principal integrity rules for the relational model. Discuss why it is desirable to enforce these rules. (5 Marks)
5. (a) Describe the main aims of the conceptual, logical and physical database design phases. (7 1/2 Marks)
- (b) Discuss the concept of data independence and explain its importance in a database environment. (7 1/2 Marks)

Course Code	:	MCS-024
Course Title	:	Object Oriented Technologies and Java
Assignment Number	:	MCA(II)/024/Assignment/15-16
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2015 (For July 2015 Session) 15th April, 2016 (For January 2016 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 features of Object Oriented Programming . *(5 Marks)*
- (b) What is platform independence? Explain why java is platform independent. *(2 Marks)*
- (c) Write a program to explain how array of objects may be created in java. *(3 Marks)*
2. (a) Write a java program to demonstrate use of different data types available in java. *(4 Marks)*
- (b) Explain followings in context of java, with the help of examples. *(6 Marks)*
 - (i) Class and objects
 - (ii) Abstraction and encapsulation
 - (iii) Application program and applet program
3. (a) What is static variable and static method? Explain why main method in java is always static. *(2 Marks)*
- (b) What is inheritance? Explain the advantage of inheritance with an example program. What are different types of inheritance supported by java? *(5 Marks)*
- (c) Explain the steps involved in creating a distributed application using Remote Method Invocation (RMI). *(3 Marks)*
4. (a) What is polymorphism? Is Interfaces in Java, a kind of polymorphism? Justify your answer with the help of an example. *(2 Marks)*
- (b) Explain the need of package in Java. Write a java program to show how package is created. *(3 Marks)*
- (c) What is rule of accessibility? Explain different level of accessibility in java. *(5 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 how an exception is handled in Java. Explain hierarchy of different exception classes in java. Also explain why is it not necessary to handle runtime exception? (6 Marks)
- (c) Write a java program to create two threads with different priority. (2 Marks)
6. (a) What is I/O stream in java? Write a program in java to create a file and copy the content of an already existing file into it. (4 Marks)
- (b) Create an Applet program to display your brief profile with your photograph. Make necessary assumptions and use appropriate layout in your program. (4 Marks)
- (c) Differentiate between String and StringBuffer classes. Also write a program to find the length of a given string. (2 Marks)
7. (a) What is need of layout manager? Explain different layouts available in java for GUI programming. (4 Marks)
- (b) What is a TCP/IP socket? Write a java program to create socket. (3 Marks)
- (c) Explain the need of JDBC? Explain steps involved in connecting a databases using JDBC. (3 Marks)
8. (a) Explain basic networking features of java. (2 Marks)
- (b) What are principles of event delegation model? Explain different sources of events and event listener. (3 Marks)
- (c) What is servlet? Explain various ways of session management in servlet programming. (5 Marks)

Course Code	:	MCSL-025
Course Title	:	Lab Course
Assignment Number	:	MCA(II)/L-025/Assignment/15-16
Maximum Marks	:	50
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 addition of two numbers which have at least 20 digits each. (5 marks)
2. Write a program in C language that will accept a Graph as input and will generate its Minimum Cost Spanning Tree. (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 words in the file which have at least one vowel as output. (5 marks)
2. Your PC is on a network. Connect a Printer physically to your PC. (5 marks)

PART-3: MCS-023

1. Create a database consisting of Name of Alumni, Organization, Designation, Programme of Study, Year of Passing, Enrollment Number, Employment Status (10 marks)
After creating the database, list the number of Alumni who have done MCA.

PART-4: MCS-024

1. Write a program in Java for the addition of two sparse matrices. (5 marks)
2. Write a program in Java that connects to a database and generates a report consisting of the courses study center wise where the student attendance to theory classes is at least 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.