MASTER OF COMPUTER APPLICATIONS (MCA_NEW)

ASSIGNMENTS
OF MCA_NEW (2Yrs) PROGRAMME
SEMESTER-II

(July - 2023 & January - 2024)

MCS-218, MCS-219, MCS-220, MCS-221

MCSL-222, MCSL-223

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

CONTENTS

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 Programme Guide of MCA (2Yrs).
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 Programme Guide of MCA (2yrs).
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-218**
Course Title	**:**	**Data Communication and Computer Networks**
Assignment Number	**:**	**MCA_NEW(II)/218/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last Dates for Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

Note: Answer all the questions in the assignment which carry 80 marks in total. 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 formatof presentation.

Q1: What is OSI model? What is TCP/IP model? Compare them. **(30 Marks)**

Q2: What is Packet Switching? What is Circuit Switching? Compare them. **(30 Marks)**

Q3: Explain STOP & WAIT ARQ. **(20 Marks)**

Course Code	**:**	**MCS-219**
Course Title	**:**	**Object Oriented Analysis and Design**
Assignment Number	**:**	**MCA_NEW(II)/219/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last date of Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

This assignment has eight questions of 80 Marks. 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 formatof presentation.

Q1: What is OOAD? Explain basic principles of object orientation. **(10 Marks)**

Q2: Draw class diagram for online shopping system. Make necessary assumptions. **(10 Marks)**

Q3: Explain object model and dynamic model in detail with the help of suitable diagrams. **(10 Marks)**

Q4: Draw state diagram for Online Flight Ticket Booking. Also, list the assumptions made. **(10 Marks)**

Q5: What is concurrency? Explain how concurrency is handled with the help of suitable example. **(10 Marks)**

Q6: What is need of inheritance adjustment in system design? Explain how inheritance adjustment can be performed, with the help of an example. **(10 Marks)**

Q7: Map the object classes created in Question 2 above into database tables. Make necessary assumptions **(10 Marks)**

Q8: Write short note on followings (minimum in 300 words) **(10 Marks)**

i) Mapping designs to code

ii) Collaboration Diagram

Course Code	**:**	**MCS-220**
Course Title	**:**	**Web Technologies**
Assignment Number	**:**	**MCA_NEW(II)/220/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last date of Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

This assignment has eight questions. All the questions are compulsory and there is no choice. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Give examples other than the ones discussed in the course material. Please go through the guidelines regarding assignments given in the Programme Guide.

Q1: What is design pattern? What are the advantages of using patterns? Explain UML diagram of Factory Design Pattern. **(10 Marks)**

Q2: **(a)** What is Servlet? Briefly explain servlet life cycle. Also write a servlet which displays "welcome to web programming". **(5 Marks)**

Q2: **(b)** What are JSP directives? Explain the use of any two JSP directives with the help of a program. **(5 Marks)**

Q3: What session management? Write a servlet program to demonstrate the use of HttpSession and its methods setAttribute and getAttribute **(10 Marks)**

Q4: (a) Explain process of creating records using Spring Boot and Hibernate. **(5 Marks)**

Q4: (b) Explain how testing of custom login form can be performed with the help of an example. **(5 Marks)**

Q5: Explain Spring MVC configuration process. **(10 Marks)**

Q6: Explain how CRUD is mapped to SQL statement, with example. **(10 Marks)**

Q7: Write short notes on the following: 5 each **(10 Marks)**

(a) JSP implicit objects

(b) Java Secure Socket Extension

(c) Servlet Collaboration

(d) J2EE Architecture

Q8: What is Role-based Login? Explain how user's access can be restricted using Role-based Login. **(10 Marks)**

Course Code	**:**	**MCS-221**
Course Title	**:**	**Data Warehousing and Data Mining**
Assignment Number	**:**	**MCA_NEW(II)/221/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last Date of Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

This assignment has seven questions. All the questions are compulsory and there is no choice. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Give examples other than the ones discussed in the course material. Please go through the guidelines regarding assignments given in the Programme Guide.

Q1:

a) Describe the measures of Multidimensional data modelling. Give examples. **(5 Marks)**
b) "*Data preprocessing is necessary before Data Mining process*". Justify your answer. **(5 Marks)**

Q2:

a) Give 2 examples for Star schema, Snowflake schema and Fact Constellation Schema.
Note: Give examples other than the ones discussed in the course material. **(12 Marks)**

b) Explain Multilevel Association Rules with appropriate examples. **(8 Marks)**

Q3:

Discuss **any two** Use Cases of implementing Data Marts in organizations which includes their dimensional design, ETL, data quality, security aspects, dash boards, data mining techniques etc.
(10 Marks)

Q4:

a) What is/are the main objective(s) of Classification? Give the categorization of Classification Approaches. Also, explain how to evaluate the Clustering models? **(5 marks)**
b) Write and explain the basic Agglomerative Hierarchical Clustering Algorithm. **(5 Marks)**

Q5:

a) What are the advantages of PAM method? Explain them. **(5 Marks)**
b) Explain how to cluster the data sets using k-mediod clustering alogirhtm? **(5 Marks)**

Q6:

a) Compare k-Means Vs k-Medoids algorithms for Clustering. **(5 Marks)**

b) What is the main objective of Clustering? Give the categorization of Clustering Approaches. Also, explain how to evaluate the Clustering Algorithms? **(5 Marks)**

Q7:

Describe the functionalities of ***Rattle*** Data Mining tool. State whether it is a proprietary or open source tool? Discuss the process of installation. Describe its complete set of features? Explain its comprehensive and well-developed user interface? With the help of integrated log code tab, explain how it produces the duplicate code for GUI operations? Briefly, explain the support of visualization elements in the tool. Also illustrate a UseCase of it. **(10 Marks)**

Course Code	**:**	**MCSL-222**
Course Title	**:**	**OOAD and Web Technologies Lab**
Assignment Number	**:**	**MCA_NEW(II)/222/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last date of Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

Note: This assignment has two sections. Answer all questions in each section. Each Section is of 20 marks. Your Lab Records will carry 40 Marks (20 Marks for each section). Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. You must execute the program and submit the program logic, sample input and output along with the necessary documentation. Assumptions can be made wherever necessary. Please go through the guidelines regarding assignments given in the Programme guide for the format of presentation.

Section 1: OOAD Lab

Q1: Draw Use Case Diagram for Online Bus Ticket Booking System. Make necessary assumptions required. **(10 Marks)**

Q2: Draw Class Diagram for Online Bus Ticket Booking System. The system supports from searching of Busses from source to destination. Display type of seats, fare, availability of seats, option for seat selection. Also, system support online payment. Make necessary assumptions required. **(10 Marks)**

Section 2: Web Technologies Lab

Q1: Write a program using JDBC and JSP to support editing (address modification, mobile number/ email id update) of saving bank account details. The program should take account number or registered mobile number as input. **(10 Marks)**

Q2: Write a program to create simple CRUD (Create, Read, Update, and Delete) application using Spring Boot and Hibernate for Online Library Management. Make necessary assumptions required. **(10 Marks)**

Course Code	**:**	**MCSL-223**
Course Title	**:**	**Computer Networks and Data Mining**
LabAssignment Number	**:**	**MCA_NEW(II)/223/Assign/2023-24**
Maximum Marks	**:**	**100**
Weightage	**:**	**30%**
Last Dates for Submission	**:**	**31st October, 2023 (For July, 2023 Session)** **15th April, 2024 (For January, 2024 Session)**

The assignment has two parts A and B. Answer all the questions. Each part is for 20 marks. Computer Networks and Data Mining lab record carries 40 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 MCA(New) Programme Guide for the format of presentation. If any assumptions made, please state them.

PART-I: Computer Networks

Q1: Create a simple network topology having two client nodes on left side and two server nodes on the right side. Both clients are connected with another node **n1**. Similarly, both server node are connected to node **n2**. Also connect nodes **n1** and **n2** thus forming a dumbbell shape topology. Use point to point link only. You can use any Network Simulator. **(20 Marks)**

PART-II: Data Mining Lab

Q1: Perform the following:

a. Create an **Exam_Results** Table with the help of Data Mining Tool WEKA. **(4 Marks)**

b. Apply Pre-Processing techniques to the training data set of **Exam_Results** Table. **(4 Marks)**

c. Normalize **Exam_Results** Table data using Knowledge Flow / any other similar tool. **(4 Marks)**

d. To construct a Decision Tree for **Exam_Results** data and classify it.

Note: Assumptions can be made wherever necessary. State them. **(4 Marks)**

e. Write a procedure for Visualization for **Exam_Results** Table. **(4 Marks)**