MASTER OF SCIENCE (INFORMATION SECURITY)
(MSCIS)

ASSIGNMENTS
JAN 2023

Semester-III

MSE-029, MSE-030, MSE-031, MCS-226 and MSEL-032

SCHOOL OF VOCATIONAL EDUCATION AND TRAINING
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068

CONTENTS

Guidelines regarding submission of assignments

1. It is compulsory for the students to submit the prescribed assignments. They will not be allowed to appear for the term-end examination of a course if they do not submit the assignments in time for that course.

2. The assignment responses should be complete in all respects. Before submission, the students should ensure that they have answered all the questions in all assignments. Incomplete answer sheets bring poor grades.

3. The University/ Regional Centre have the right to reject the assignments received after the due date. Therefore, the students are advised to submit their assignments before the due date.

4. Students should submit before the last dates prescribed for submission of assignments.

5. In case the students have already done some assignments prescribed in a course, they are required to do the **left-over assignments before taking the Term-end Examination**. If they have qualified in a course on the basis of lesser number of assignments and Term-end Examination, they will **not be eligible to re-do the assignments** with a view to improve the overall qualifying score of that course.

6. In case any student fails to submit the assignments or fails to score minimum qualifying marks, s/he has to wait for fresh assignments meant for the current batch of students.

7. For their own record, students should retain a copy of all the assignment responses, which they submit.

8. Once the students get the pass marks in an assignment, they can not re-submit it for improvement of marks. If the student secured requisite marks in Term-End Examination and Assignments, but did not get requisite overall percentage, then the student can either resubmit the assignment or reappear for the term-end examination for securing the requisite overall percentage.

9. Assignments are not subject to re-evaluation.

Instructions for Doing Assignments

While answering Assignments, the following guidelines are required to be observed:

1. The student should write their Complete correct Enrolment Number, Name, Full Address, Signature and Date on the top right hand corner of the first page of the response sheet.
2. The students should write the Programme Title, Course Code and Course Title on the left hand corner of the first page of their response sheet. Course code may be reproduced from the assignment.

The top of the first page of your response sheet for each assignment should look like this:

PROGRAMME TITLE:	ENROLMENT No.: ……………….
COURSE CODE:	NAME : ………………………………
COURSE TITLE:	
ADDRESS:…………………………………………………………………………...	
SIGNATURE: ……………………	
DATE: …………………………..	

3. The students should write the responses in their own hand. **They should not print or type the answers. They should not reproduce their answers from the units sent to them by the University. If they reproduce from units, they will get poor marks for the respective question**.

4. The students should write each assignment separately. All the assignments should not be written in continuity.

5. The students should write the question number with each answer.

6. The students should use only foolscap size paper for their response and tie all the pages carefully. Avoid using very thin paper. They should allow a 4 cm. margin on the left and at least 4 lines in between each answer. This may facilitate the evaluator to write useful comments on the margins at appropriate places.

7. The students should not copy from the response sheets of other students. If copying is noticed, the assignments of such students will be rejected, and disciplinary action can be taken against the students as per rules of the University.

8. Please remember that it is compulsory to send scanned copies of handwritten assignments through email to the respective Regional Centre email or upload on the link provided on the respective Regional centre's website or the hard copy of handwritten assignments to your concerned Regional centre/Study centre before you can take the Term End Exams or else you will not be issued hall tickets.

    Under no circumstances should they be sent to the (SED) for evaluation.

Course Code	:	MSE-029
Course Title	:	**Cyber Attack: Use of Technology in Cyberspace**
Maximum Marks	:	**100**
Weightage	:	**30%**
Last date of Submission	:	**31st March, 2023 (For latest update, Pl. check IGNOU's Website)**

Attempt any five questions out of seven 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 for the format of presentation.

Q1: What is the classification and types of networks? Explain in detail with examples.

Q2: What are types of Security attacks? Explain different vulnerabilities with examples.

Q3: Explain triad's components of Cybersecurity in detail.

Q4: List out the Cybercrimes groups and describe the primary categories of Cybercrime with examples.

Q5: What do you mean by Penetration testing? Describe Pen Testing Process and Penetration testing methods.

Q6: Describe steps of Server Security in detail.

Q7: What do you mean by OSINT Tools. Discuss different OSINT Tools in detail.

Course Code	:	MSE-030
Course Title	:	Cloud and Infrastructure Security
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	31st March, 2023 (For latest update, Pl. check IGNOU's Website)

Attempt any five questions out of seven 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 for the format of presentation.

Q1: Discuss Characteristics, Benefits, Applications and challenges of Cloud Computing.

Q2: Explain Cloud deployment models in detail.

Q3: Explain Cloud architecture and layers of Cloud anatomy in detail.

Q4: Discuss important characteristics of virtualization.

Q5: What is Resource Pooling? Describe Resource Pooling architecture in detail.

Q6: What do you mean by Scaling and explain its strategies in detail.

Q7: Discuss auto scaling in cloud.

Course Code	:	MSE-031
Course Title	:	Cyber Security using Python
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	31st March, 2023 (For latest update, Pl. check IGNOU's Website)

Attempt any five questions out of seven 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 for the format of presentation.

Q1: Briefly discuss about the concepts of UBUNTU for Python. Which word is used before every command for a user for running commands in LINUX terminal? Give your examples.

Q2: Describe Object Oriented approach, Classes and Methods, Libraries, Networking for Python.

Q3: What do you mean by Cyber Security? Describe importance, threats, purpose and benefit of python for Cyber security.

Q4: Describe Python Libraries for Cyber Security. How is Python used in Pen Testing.

Q5: What do you mean by Cryptography? Describe its data security techniques.

Q6: Describe basics of Networking. How many communication links are required to connect 'n' devices in case of mesh topology.

Q7: a) How Social media platforms can be used to expand intelligence?
b) Explain malicious web scraping and its uses.

Course Code	:	MCS-226
Course Title	:	Data Science and Big Data
Assignment Number	:	MCA(III)/226/Assignment/2022
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	31st March, 2023 (For latest update, Pl. check IGNOU's Website)

This assignment has sixteen questions of 5 Marks each, 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.

Q1: What is data science? What are its applications? Define the terms Descriptive, Exploratory and Predictive in the context of data analysis. What is the difference between Causal inference and prediction?

Q2: Explain the following with the help of an example in the context of statistics and Probability:
Conditional Probability, Bayes Theorem, Normal distribution, Central limit theorem and Statistical Hypothesis

Q3: Explain the concept of data pre-processing, data extraction, data cleaning, data curation and data integration with the help of an example of each.

Q4: A class has 25 students. Create a data set of marks of the students in Mathematics out of a maximum of 50 marks. Make the histogram and box plot for this data. Can you draw scatter plots using this data? Give reasons in support of your answer.

Q5: Explain Big data and its characteristics. How is Big data different to relational data? Explain with the help of an example. Define the characteristics of HDFS. Explain purpose of name node, data node and job tracker in this context.

Q6: What is Map-Reduce programming? Explain the map phase, shuffling and sorting and reduce phase with the help of an example of word counting problem.

Q7: Explain the features of Apache SPARK, HIVE and HBASE.

Q8: What are NoSQL databases? How are they different from relational database management system? List the features of any four types of NoSQL databases.

Q9: Explain the Jaccard similarity of sets with the help of an example. What are the ways of finding similarity between two documents? Also, define the term collaborative filtering.

Q10: What is a data stream? How is it different to relational data? List the issues and challenges of handling data streams. What is the role of bloom filter?

Q11: Explain the role of link analysis. Explain a page ranking algorithm with the help of an example. What is link spam? Explain the role of hubs and authorities for finding page rank.

Q12: Explain the process and issues of the following:
Advertising on web, Recommendation system, Mining of social networks.

Q13: Write program using R for the following tasks:

    (i)   Computation of income tax of a vector of size 10, consisting of total annual income of 10 different person. The tax computation should be 10%, if annual income is below 5 lakhs and 20% if it is above 2 lakhs.

    (ii)   Matrix addition, subtraction and multiplication

    (iii)   Finding inverse of a matrix

Q14: Create a sample data of the marks of 20 students in five different subjects using MS- Excel. How can you use this data for programming in R? Write programs using R programming language to create four different plots using this data.

Q15: Write program using R to demonstrate any one of
the following: chi-square testing or linear
regression or logistic regression.
You may choose any sample data.

Q16: Write steps about how R programming language can be used for performing the following analysis task:
(i) classification (ii) clustering (iii) finding association rules

Course Code	:	MSEL-032
Course Title	:	**Practical (Cyber Attacks, Cloud Security and Data Recovery etc)**
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	31st March, 2023 (For latest update, Pl. check IGNOU's Website)

This assignment has two Questions, answer all questions. Each Question is of 20 marks. Your Lab Records will carry 40 Marks (20 Marks for each Question). 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.

Note: 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.

Q1: **D**iscuss the Deployment of OpenStack using DevStack with all steps.

(20 marks)

Q2: Explain Man in the middle attack (MITM) using Ettercap   (**20 marks**)

Note: Make necessary assumptions if any.