Central University of Rajasthan

Center for Distance and Online Education (CDOE)

Dear Learner,

Greetings from the CDOE!

As you are aware, every student enrolled in the ODL Programme is required to write and submit assignments for each course. These assignments form an important component of the continuous assessment and carry **30% weightage** of the overall grade for each course.

Please carefully note the following instructions:

General Instructions

1. Please remember to attach the designated cover page on every assignment you submit. The format of cover page is attached for your reference.
2. All sections of the assignment are compulsory in nature. All questions are to be attempted, except for those where options are provided.
3. Please write the answer mentioning the correct corresponding question number given in the assignment.
4. Please write on continuous pages and number each page.
5. All assignments should be handwritten. Typed or printed assignment will not be accepted.
6. it is strongly recommended to keep a copy (photocopy or scanned) of the assignment sent by you for your record.
7. **The last date for submitting assignments is 30.11.2026.** Submission of assignments is required to appear in the End Semester Examination.
8. Assignments can be deposited at CDOE, Curaj or sent through post to **Director, Centre for Distance and Online Education (CDOE), Room 102, Administration Building, Central University of Rajasthan, Bandarsindari, District: Ajmer – 305817, Rajasthan**.

Director

Centre for Distance and Online Education (ODL & OP)

राजस्थान केन्द्रीय विश्वविद्यालय

CENTRAL UNIVERSITY OF RAJASTHAN

Assignment

Open and Distance Learning Programme

Academic Year : 2026-2027 **Session : July, 2026**

Learner's Name: _____

Enrollment Number: _____

Programme Name and Code: _____

Course Code: _____

Course Title: _____

_____

Learner's Signature

Centre for Distance and Online Education (CDOE)

Room 102, Administration Building, Central University of Rajasthan

N.H. 8, Bandarsindari, District: Ajmer – 305817, Rajasthan

Website: www.curaj.ac.in | Email: cdoe@curaj.ac.in | Phone: 01463 257 556

Central University of Rajasthan

Centre for Distance and Online Education

Open and Distance Learning Programme

Assignment

Programme Name: M.Sc. (Computer Science) **Programme Code: ODLMSCS**

First Semester

Instructions:

1. In the M.Sc. (Computer Science) programme, two assignments have been planned for the continuous evaluation of the learner in each course.
2. The learner can appear in the term-end examination of the concerned course only after completing both assignments and submitting them within the stipulated time period.
3. Each assignment carries 15 marks. Thus, a total of 30 marks are allocated for assignments for each course.
4. The assignments must be written in the learner's own handwriting. Typed or printed assignments will not be accepted.
5. The learner should complete the sessional assignments within the stipulated time and send them by post or submit them in person at the following address:

Address for Submission of Sessional Assignments:

Director, Centre for Distance and Online Education (CDOE), Room - 102, Administration Building, Central University of Rajasthan, Bandarsindari, Jaipur – Ajmer highway, District - Ajmer – 305817, Rajasthan.

Title of the Course: Introduction to Artificial Intelligence
Course Code: 6.0 ODLCSC01
Assignment: 01

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80-100)**

1. What is Artificial Intelligence? [2]
2. What is the Turing Test? [2]
3. How is heuristic search is different from uninformed search? [2]
4. Define knowledge-based system in the context of artificial intelligence. [2]
5. Describe how the branch-and-bound technique could be used to find the shortest solution to a water jug problem. [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Show how means-ends analysis could be used to solve the problem of getting from one place to another. Assume that the available operators are walk, drive, take the bus, take a cab, and fly. [5]

Assignment: 02

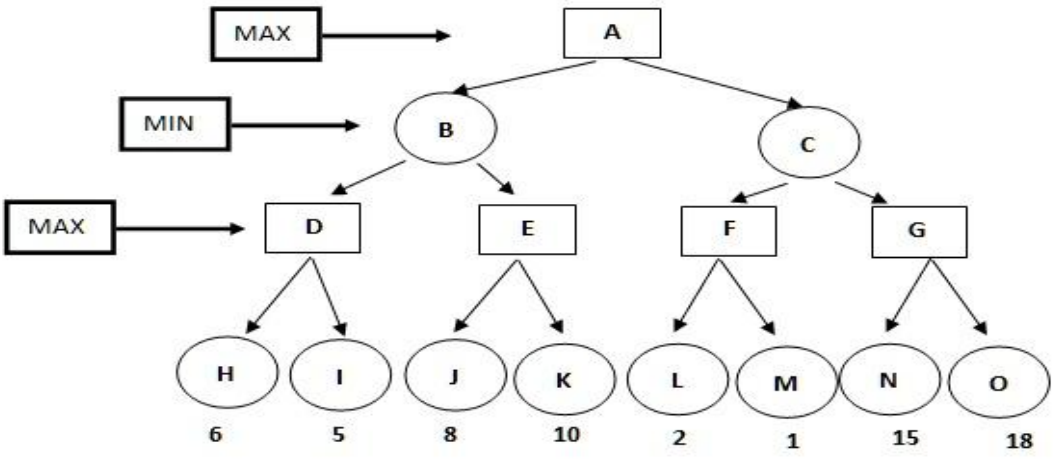
Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80-100)**

1. What is the goal of the Minimax Algorithm? [2]
2. Does AI aim to put the human mind into the computer? [2]
3. What are the uses of heuristic functions? [2]
4. Define hill climbing and mention its drawbacks. [2]
5. Define a Constraint Satisfaction Problem (CSP). [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Given the following search tree, apply the alpha-beta pruning algorithm to it and show the search tree that would be built by this algorithm. Make sure that you show where the alpha and beta cuts are applied, and which parts of the search tree are pruned as a result. [5]



Title of the Course: Advanced Algorithms
Course Code: 6.0 ODLCSC02
Assignment: 01

Maximum Marks: 15

Short Answer type Questions:(attempt all Questions) **(Word Limit: 80 - 100)**

1. What is Divide and Conquer strategy? [2]
2. What is the key idea behind Dynamic Programming? [2]
3. What is a randomized algorithm for primality testing? [2]
4. State fractional Knapsack problem. [2]
5. What is the backtracking approach? [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. State 0/1 Knapsack Problem. Find an optimal solution to the 0/1 knapsack instance given below by using Branch and Bound method. { W = 10 } [5]

Item	Weight(Wi)	Profit(Pi)
1	4	40
2	7	42
3	5	25
4	3	12

Assignment: 02

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80 - 100)**

1. Give formal definitions for complexity measures- Theta(θ), Omega(Ω) and big oh(O). [2]
2. Differentiate between Monte-Carlo and Sherwood randomized algorithms. [2]
3. Define time and space complexity. What do you understand by the Best-case and Worst-case complexity of an algorithm? [2]
4. What do you mean by string-matching? [2]
5. What is a feasible solution? [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. What do you mean by an approximation algorithm? Why do we need approximation algorithms? Give an approximate solution for a TSP (Travelling Salesman Problem) having the following distance matrix. [5]

$$\begin{bmatrix} 0 & 5 & 7 & 9 & 3 \\ 5 & 0 & 4 & 12 & 6 \\ 7 & 4 & 0 & 10 & 3 \\ 9 & 12 & 10 & 0 & 8 \\ 3 & 6 & 3 & 8 & 0 \end{bmatrix}$$

Title of the Course: Advanced Python Programming
Course Code: 6.0 ODLCSC03
Assignment: 01

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80 - 100)**

1. What do you understand about modules in python? [2]
2. What are the different operators in python with examples? [2]
3. Define strip( ), split( ) and join( ) string methods in Python. [2]
4. Define polymorphism. Give a simple example of how the + operator exhibits polymorphic behavior. [2]
5. Describe various types of arguments available in python functions. [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Explain in detail with examples: [5]
   a) File handling
   b) Access modes
   c) Reading and writing files
   d) renaming and deleting files

Assignment: 02

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80 - 100)**

1. What are the different flow control statements available in Python? Explain with a suitable example. [2]
2. Write a Python program to compute the factorial of a given number. [2]
3. Differentiate between global and local variables in Python. [2]
4. List different types of plots that can be created using Matplotlib.with examples of their typical use cases. [2]
5. What is exception handling in Python? [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Write a program that accepts a sentence and calculate the number of uppercase letters and lowercase letters. [5]
   Suppose the following input is supplied to the program:
   Helloworld!
   Then, the output should be:
   UPPER CASE 1
   LOWER CASE 9

Title of the Course: Internet of Things(IoT)
Course Code: 6.0 ODLCSC12
Assignment: 01

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80 - 100)**

1. What is IoT? [2]
2. What is M2M communication? [2]
3. What is a Wireless Sensor Network (WSN)? [2]
4. What is Zigbee, and on which IEEE standard is it primarily based? [2]
5. What are the two key characteristics that distinguish WSNs from traditional wireless networks. [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. How does an RFID system communicate? and how is it used for IoT applications? [5]

OR

Discuss various types of sensors used in IoT and their real-world applications. [5]

Assignment: 02

Maximum Marks: 15

Short Answer type Questions:(attempt all Questions) **(Word Limit: 80 - 100)**

1. What is latency in networks? [2]
2. Define QoS (Quality of Service). [2]
3. What is MQTT (Message Queuing Telemetry Transport), and what messaging pattern does it follow? [2]
4. State two advantages of the publish-subscribe architecture over client-server architectures in IoT. [2]
5. What is multi-hop communication? [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Discuss the role of Python Pandas library for data manipulation. Write code to perform the following operation using pandas. [5]
   - (i) Read and print the contents of a CSV file.
   - (ii) Select a single column from the data frame.
   - (iii) Filter data based on any condition.
   - (iv) Aggregate data.
   - (v) Merge two data frames.

Title of the Course: Distributed Systems
Course Code: 6.0 ODLCSC15
Assignment: 01

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80 - 100)**

1. Define a Distributed System. Explain its key characteristics with suitable example.[2]
2. What is inter-process communication (IPC)? [2]
3. Explain the concept of Remote Procedure Call (RPC) and its basic operation steps. [2]
4. What is a Thread, and how does it differ from a process? [2]
5. Define Concurrency Control in distributed file systems. [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Explain the various Architectural Models of Distributed Systems in detail. [5]

Assignment: 02

Maximum Marks: 15

Short Answer type Questions: (attempt all Questions) **(Word Limit: 80 - 100)**

1. Define Virtualization and its importance. [2]
2. What is deadlock detection in distributed systems? [2]
3. Explain distributed file systems and their features. [2]
4. Explain Sun NFS architecture. [2]
5. Discuss concurrency control and recovery. [2]

Long Answer type Question: **(Word Limit: 300 - 400)**

1. Differentiate between PRAM (Pipelined Random Access Memory) consistency and processor consistency models with suitable example. [5]

Title of the Course: Professional Communication
Course Code: 6.0 ODLCSC04
Assignment: 01

Maximum Marks: 15

Long Answer type Questions: (Attempt any three) **(Word Limit: 300 - 400)**
[5*3 = 15]

1. Write a note on Oral Communication. [5]
2. Explain the different styles of Reading. [5]
3. How does body language affect the process of Communication? [5]
4. 'Word stress plays an important role in enhancing speaking skills'. Explain the statement with examples. [5]
5. Identify the Participles and Gerunds in the following sentences: [5]
    a. Hearing the noise, he ran to the window.
    b. Walking on the grass is forbidden.
    c. Much depends on Ram's returning before noon.
    d. The miser hated spending money.
    e. Jumping over the fence, the thief escaped.

Assignment: 02

Maximum Marks: 15

Long Answer type Questions: (Attempt any three) **(Word Limit: 300 - 400)**
[5*3 = 15]

1. Write a short note on Clauses with examples. [5]
2. Differentiate between Technical Writing and Creative Writing. [5]
3. Explain the writing process used for a paragraph. [5]
4. What are the essential characteristics of a good presentation? [5]
5. Write a cover letter targeting a position/program that you are interested in. [5]