MASTER OF COMPUTER APPLICATION

ASSIGNMENTS

MCA – 2nd SEMESTER

(SESSON 2023-2024)

Centre for Distance and Online Education (CDOE)
Guru Jambheshwar University of Science & Technology
Hisar - 125001

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR

Programme: MCA **Course: Data Structures and Algorithms**
Semester: 2nd **Paper Code: MCA-21**
Max Marks: 30

Important Instructions

i. **Attempt all questions from each assignment given below.**
ii. **Each assignment carries 15 marks.**
iii. **All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.**

ASSIGNMENT-I

1. What is data structure? Explain various types of data structure in detail.
2. Convert the following infix expression to postfix using stack.
   (A+B*C)/(D-E)+F
3. What is binary tree? Explain the representation of binary tree? Explain the different operation in a binary tree.

ASSIGNMENT-II

1. Sort the following list given below using heap sort.
   66,33,40,20,50,88,60,11,77,30,45,65
2. Define Warshall's algorithms with example.
3. Explain bubble sort with suitable example.

Prepared By:
Mr. Neeraj Verma
Assistant Professor (CSE)
CDOE, GJUS&T, Hisar

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR

Programme: MCA **Course: Python Programming**
Semester: 2nd **Paper Code: MCA-22**
Max Marks: 30

Important Instructions

i. **Attempt all questions from each assignment given below.**
ii. **Each assignment carries 15 marks.**
iii. **All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.**

ASSIGNMENT-I

1. How to declare and call functions in Python programs? Illustrate with an example script.
2. Summarize various operators, built-in functions and standard library modules that deals with Python's numeric type.
3. Explain the following file built-in functions and method with clear syntax, description and illustration:

   a) open( ) b) file( ) c) seek( ) d) tell( ) e)read( )

ASSIGNMENT-2

1. What is the motivation behind parallelism and state how python achieves parallelism?
2. Explain briefly about thread and threading module objects in Python.
3. Explain List, Tuples, Sets and Strings in python; with any 2 operations. Explain with example.

Prepared By:
Er. Vinod Goyal
Assistant Professor (CSE)
CDOE, GJUS&T, Hisar

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR

Programme: MCA **Course: Artificial Intelligence**
Semester: 2nd **Paper Code: MCA-23**
Max Marks: 30

Important Instructions

i. **Attempt all questions from each assignment given below.**
ii. **Each assignment carries 15 marks.**
iii. **All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.**

ASSIGNMENT-I

Q1. Define Artificial Intelligence. Explain the techniques of artificial intelligence. Also describe the characteristics of Artificial Intelligence.

Q2. What are various heuristics search techniques? Explain how they are different from the search techniques.

Q3. Differentiate between Rule-based architecture and non-production system architecture.

ASSIGNMENT-II

Q1. Define uncertain knowledge, prior probability and conditional probability. State the Baye's Theorem. How is it useful in decision making under uncertainty?

Q2. Explain various phases involved in Natural Language Processing.

Q3. Explain the following:

a. Production System
b. Neural Network
c. Bayesian Networks

Prepared By:
Dr. Ritu
Assistant Professor (CSE)
CDOE, GJUS&T, Hisar

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR

Programme: MCA 2-Year **Course: Computer System Architecture**
Semester: 2nd **Paper Code: MCA-24**
Max Marks: 30

Important Instructions

i. **Attempt all questions from each assignment given below.**
ii. **Each assignment carries 15 marks.**
iii. **All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.**

ASSIGNMENT-I

1. What are logic gates? Give a brief idea of Boolean algebra.
2. What are multiplexer and de-multiplexer? Implement 8x1 multiplexer using 4x1 multiplexers and 2x1 multiplexer.
3. What is flip-flop? How does SR flip-flop work? Why JK flip flop is called universal flip-flop? Discuss in detail.

ASSIGNMENT-II

1. What are computer registers? Draw and explain the computer registers organization.
2. Explain the memory hierarchy in the computer systems. Also explain different types of memory available with us.
3. What is a DMA? Draw its block and IC diagram and also explain its working.

Prepared By:
Mr. Neeraj Verma
Assistant Professor (CSE)
CDOE, GJUS&T, Hisar

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR

Programme: MCA 2-Year **Course: Discrete Mathematics and Optimization**
Semester: 2nd **Paper Code: MCA-25**
Max Marks: 30

Important Instructions

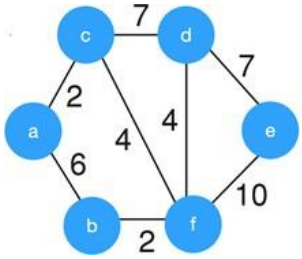
i. **Attempt all questions from each assignment given below.**
ii. **Each assignment carries 15 marks.**
iii. **All questions are to be attempted in legible handwriting on plane white A-4 size paper and same is uploaded through login your account.**

ASSIGNMENT I

1. Define relation. Explain equivalence relation with example.
2. Verify that the proposition $(p \wedge q) \wedge \neg (p \vee q)$ is a contradiction.
3. Define the following: (a) recursive function (b) Total function (c) Partial function.

ASSIGNMENT II

1. What is a group. Prove that G = {0,1,2,3,4} is an abelian group of order 5,
2. What is the weight of the minimum spanning tree using the Prim's algorithm?



3. Solve the following problems using Simplex Method.Max. $z = 2x_1 + x_2$, subject to

$4x_1 + 3x_2 \leq 12,$

$4x_1 + x_2 \leq 8,$

$4x_1 - x_2 \leq 8$

and $x_1, x_2 \geq 0.$

Prepared By:
Ms. Kapila Devi
Assistant Professor (CSE)
CDOE, GJUS&T, Hisar