

## Uttar Pradesh Rajarshi Tandon Open University

School of Science, Assignment Session 2021-22

Course Code: <b>PGDCA-101</b>	Course Title: Computer Fundamentals and Its Organization	Maximum Marks : 30
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### Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Convert the following Number System.

- a)  $(534)_8 = ( ? )_{16}$
- b)  $(101011)_2 = ( ? )_8$
- c)  $(624)_8 = ( ? )_2$
- d)  $(11101)_2 = ( ? )_8$
- e)  $(3B1)_{16} = ( ? )_2$
- f)  $(AC2)_{16} = ( ? )_8$

2. Draw a block diagram of a computer. Explain the function of each of the blocks. Explain input and output devices.

3. What are the various objectives and functions of Operating systems? . What are the major activities of an operating systems with regard to process management?

### Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. What is Cache Memory? How it reduce the mismatch of processor and main memory speed?

5. Explain the magnetic Disk storage organization.

6. Explain the storage organization of Compact Disk ROM.

7. What is difference between Magnetic disk & Magnetic Tape?

8. What is the difference between multitasking and multiprogramming operating system?

9. What is input-output Device? Explain the role of input-output device in computer system.



**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -103</b>	Course Title: <b>C Programming</b>	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. What are different basic data types in C ? Explain the need of different numeric data types with example of each.
  
2. What is an array ? Write a C program using array to find largest and smallest number from a list of 100 given numbers
  
3. What is union ? How it is different from structure ? Explain. How a union is declared in C ? Also write a program in C to show use of union.

**Section - B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. Explain the differences between static and auto variables, with example of each.
  
5. Differentiate between call by value and call by reference using example program.
  
6. Explain the syntax of do-while statement. Also differentiate do-while from while Statement
  
7. What is recursion?
  
8. What are the logical operators in C ?
  
9. Differentiate between call by value and call by reference using example program.

**Uttar Pradesh Rajarshi Tandon Open University**

School Computer and Information of Science, Assignment Session 2021-22

Course Code: <b>PGDCA -104</b>	Course Title: <b>Numerical Analysis</b>	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Describe the merits of Newton's method of iterations. State the Newton Raphson formula and the criteria for convergence
2. Solve by Gauss Elimination method  $x + y = 2$  and  $2x + 3y = 5$ . State the condition for Convergence of Iteration method.
3. Which is better Taylor's method or R. K. Method?(or) State the special advantage of Runge-Kutta method over Taylor series method. Compare Runge-Kutta methods and predictor –corrector methods for solution of initial value problem.

**Section - B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. What is the order of convergence of Newton-Raphson methods if the multiplicity of the root is one.
5. State the principle used in Gauss-Jordan method.
6. State the Lagrange's interpolation formula. What are the advantages of Lagrange's formula?
7. What are the errors in Trapezoidal rule of numerical integration?
8. State the third order R.K method algorithm to find the numerical solution of the first order differential equation.
9. State the disadvantages of Taylor series method.

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -105</b>	Course Title: Computer Organization	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. What are logic gates? Explain the different types of logic gates with truth table and logic circuit diagram. Explain Boolean algebra with law
2. What is binary adder? Explain its type also. Explain half adder circuit diagram and truth table.
3. Explain the following 8085 microprocessor instruction with the help of an example Each.  
DAA  
PUSH  
LDS  
STD  
XCHG

**Section - B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. Explain Memory hierarchy with suitable diagram.
5. Explain the functionality of RAM
6. Explain any five characteristics of RISC Machine
7. What is flip flop? Explain at least two flip-flops with excitation table.
8. What do you understand by floppy disks?
9. Differentiate between asynchronous sequential circuits and synchronous sequential circuits

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -107</b>	Course Title: Data Structures	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. What is stack? Why it is known as LIFO? Write algorithm of PUSH and POP operation on stack.
2. What is queue? Why it is known as FIFO? Write an algorithm to insert and delete an element from a simple queue.
3. What is tree traversal. Explain the in-order, preorder and post-order traversal.

**Section - B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words

4. Explain recursion. Write a recursive algorithm to calculate factorial of a number.
5. What is data structure? Explain various types of data structure.
6. Explain circular queue? Write an algorithm to insert and delete an element from a circular queue.
7. What is minimum spanning tree. Write algorithm to find the minimum spanning tree.
8. What is an algorithm? Discuss the different steps in the development of an algorithm?
9. Distinguish between primitive and non-primitive data structures.

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -108</b>	Course Title Organisational behavior	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. What is organisational behaviour? Explain its concept. "Organisational behaviour is interdisciplinary in nature ". Explain
2. How has globalization affected organisations and what is the impact on behavior of employees?.
3. Discuss the Principles of scientific management and Contingency theory of management. Do you think the knowledge of OB is required by a manager? Justify with examples..

**Section - B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words

4. What is the concept of perception? How is it formed?
5. What is attitude? Explain its components..
6. What are values? Differentiate between personal and organisational values..
7. Discuss the different types of motivation.
8. What is personality? Describe factors affecting it.
9. What is job satisfaction? Briefly outline the factors affecting it.

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -109</b>	Course Title : Software Engineering	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Write the IEEE definition of software engineering. Demonstrate your understanding of umbrella activities of a Software process. If you have to develop a word processing software product, what process model will you choose? Justify your answer and examine.
2. What do mean by software Testing? Differentiate verification and validation. Give an example.
3. What are SDLC in water fall model? .List two deficiencies in waterfall model. Which process model do you suggest to overcome each deficiency?

**Section – B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words

4. .List the characteristics of software contrasting it with characteristics of hardware.
5. Explain How do we create a process that can manage unpredictability?
6. Identify the human factors considered for an agile software development
7. Is it possible to realize Win-Win spiral model for software. Analyse
8. Summarize the pros and cons of iterative software development model.
9. Define agile process .Give any two agile principles.

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -110</b>	Course Title : C++ and Object Oriented Programming	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Explain, with suitable examples, the advantage of object oriented language over structured programming language.
2. What is Inheritance? Explain its advantages. Also explain with example how a subclass is derived from a super class in C++
3. What is constructor? Explain constructor overloading in C++ with an example.

**Section – B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words

4. Differentiate between method overloading and method overriding with an example
5. What is Polymorphism ?
6. Write a C++ program to find the length of a given string.
7. What is Friend function in C++ ?
8. What do you mean by dynamic binding? How it is useful in OOP?
9. What do mean by abstract class and container class?

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -111</b>	Course Title : <b>Data Communication &amp; Computer Network</b>	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Explain the OSI reference model with neat diagram.
2. Explain the various types of multiplexing
3. How does BGP resolve count to infinity problem?. Explain the operation of hierarchical routing through illustration

**Section – B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words

4. Discuss any two benefits of SSL.
5. What is spread spectrum? What are the two types of spread spectrum used in wireless data network? Elaborate.
6. What is silky windows syndrome?
7. Find the net id and host id of the following IP addresses.  
114 . 35 . 2 . 7  
133 . 57 . 6 . 8  
207 . 34 . 54 . 12
8. What is microwave transmission?
9. For n devices in a network, what is the number of cable links, number of full duplex channels for a mesh topology?

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA 01</b>	Course Title: <b>Discrete Mathematics</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

10. What is the proposition? Explain different logical connectives used in propositions with the help for example
11. Draw a Venn diagram to represent followings: (3)
  - i)  $(A \cap B \cup C) \sim A$
  - ii)  $(A \cup B \cup C) \cap (B \cap C)$
12. Explain the following types of relations with the help of suitable examples.
  - e. Reflexive
  - f. Anti symmetric
  - g. Transitive
  - h. Equivalence

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

13. Express the Boolean expression  $xyz' + y'z + xz'$  in a sum of product form.
14. Construct the logic circuit and obtain the logic table for the expression  $x1 \vee (x'2 A x'3)$
15. How many numbers are there between 100 and 1000 such that 7 is in the unit's place ?
16. Verify that the proposition  $p \vee (P \wedge Q)$  is a tautology.
17. How many permutations are there for the word ASSOCIATION ?
18. Prove De Morgan's laws using truth table.

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA 02</b>	Course Title: <b>PROBLEM SOLVING AND PROGRAMMING through C</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

10. What are different basic data types in C ? Explain the need of different numeric data types with example of each.
11. What is an array ? Write a C program using array to find largest and smallest number from a list of 100 given numbers
12. What is union ? How it is different from structure ? Explain. How a union is declared in C ? Also write a program in C to show use of union.

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

13. Explain the differences between static and auto variables, with example of each.
14. Differentiate between call by value and call by reference using example program.
15. Explain the syntax of do-while statement. Also differentiate do-while from while Statement
16. What is recursion?
17. What are the logical operators in C ?
18. Differentiate between call by value and call by reference using example program.

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA 03</b>	Course Title: <b>COMPUTER ORGANISATION &amp; ASSEMBLY LANGUAGE PROGRAMMING</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Explain the following 8086 microprocessor instruction with the help of an example each.
  - (i) DAA
  - (ii) PUSH
  - (iii) LDS
  - (iv) STD
  - (v) XCHG
2. Design and draw a 8 x 1 multiplexer using AND and OR gates and explain its working
3. Explain the DMA. How it has advantage over Interrupt driven and programmed I/O ?

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. Explain any five characteristics of RISC Machine
5. What addressing modes are most suitable for handling arrays?
6. Write a program in 8086 assembly language that prints the alphabets from A to Z.
7. Explain the concept of virtual memory.
8. What are the functions of I/O Interface ?
9. What is an error correction code?

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -E1</b>	Course Title: <b>Computer Architecture</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. What are the different types of computer registers? Discuss their functions.
2. What is control unit? Explain its functions. Explain how micro Programmed control unit is different from hardwired control unit.
3. How transfer of information between CPU and I/O devices is carried out? Explain..

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. What is meant by operation code?
5. What are Computer registers? List various types of computer registers.
6. Define Register reference instruction.
7. What is instruction cycle?
8. List the different addressing modes.
9. What is Cache memory? Explain.

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -E2</b>	Course Title: <b>Microprocessor and its Application</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words

1. Explain different parts of microprocessor in detail
2. Explain the timing of the instruction cycle of 8085 microprocessor, Discuss with example the iterative branching instructions of 8085?
3. What are the various flags available in 8085 microprocessor? What are general purpose registers? Name the various general purpose registers. Explain the pin diagram of 8085 microprocessor

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. How do you classify the memory in a computer system.
5. What is ROM? Explain its various types.
6. What are the rules for adding two binary numbers? Illustrate with an example.
7. Explain the timing of the instruction cycle of 8085 microprocessor,
8. Define machine language?
9. Define timing diagram.

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA 05</b>	Course Title: <b>OBJECT ORIENTED PROGRAMMING With C++</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words

1. Explain, with suitable examples, the advantage of object oriented language over structured programming language.
2. What is Inheritance ? Explain its advantages. Also explain with example how a subclass is derived from a super class in C++
3. What is constructor ? Explain constructor overloading in C++ with an example.

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. Differentiate between method overloading and method overriding with an example
5. What is Inheritance ?
6. Write a C++ program to find the length of a given string.
7. What is Friend function in C++ ?

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -06</b>	Course Title: <b>Database Management System</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Draw and explain the detailed system architecture of DBMS. What are the advantages of DBMS?
2. Explain in detail about various key constraints used in database system. Explain the importance of Null values in Relational Model
3. Discuss the ACID properties of a database transaction with appropriate examples. Draw transaction state diagram and describe each state that a transaction goes through during its execution.

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words

4. What is DBA? Mention the functionalities of DBA
5. How are views created and dropped? Explain, how the views are implemented and updated
6. Discuss 3-tier architecture with necessary diagram and suggest an example application
7. Explain in detail about internal hashing Techniques.
8. Discuss in detail about cluster and Multilevel indexes.
9. State BCNF. How does it differ from 3NF?

**Uttar Pradesh Rajarshi Tandon Open University**

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -07</b>	Course Title: Computer Fundamentals and Its Organization	Maximum Marks : 30
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**Section 'A'**

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Convert the following Number System.

- a)  $(534)_8 = ( ? )_{16}$
- b)  $(101011)_2 = ( ? )_8$
- c)  $(624)_8 = ( ? )_2$
- d)  $(11101)_2 = ( ? )_8$
- e)  $(3B1)_{16} = ( ? )_2$
- f)  $(AC2)_{16} = ( ? )_8$

2. Draw a block diagram of a computer. Explain the function of each of the blocks. Explain input and output devices.

3. What are the various objectives and functions of Operating systems? . What are the major activities of an operating systems with regard to process management?

**Section - B**

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. What is Cache Memory? How it reduce the mismatch of processor and main memory speed?

5. Explain the magnetic Disk storage organization.

6. Explain the storage organization of Compact Disk ROM.

7. What is difference between Magnetic disk & Magnetic Tape?

8. What is the difference between multitasking and multiprogramming operating system?

9. What is input-output Device? Explain the role of input-output device in computer system.

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA -E3</b>	Course Title: <b>Data warehouse and data mining</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. What are the different characteristics of a Data Warehouse?
2. Explain Hierarchical Clustering methods.
3. Explain Classification Algorithms.

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. Explain the role of Meta data in a data warehouse.
5. Define multidimensional and multilevel association mining.
6. What do you mean by Web mining.?
7. What is Supervised learning?
8. Define Snowflake Schema
9. Discuss K-Means Clustering.

# Uttar Pradesh Rajarshi Tandon Open University

School of Computer and Information Science, Assignment Session 2021-22

Course Code: <b>PGDCA - E4</b>	Course Title: <b>SYSTEM ANALYSIS AND DESIGN</b>	Maximum Marks : 30
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## Section 'A'

Long answer questions

Maximum marks: 18

**Note:** Write answer of three questions. Each question should be answered in 800 to 1000 Words.

1. Draw a Data Flow Diagram (DFD) **till** second level depicting various processes, data flow and data repositories for a "Library Management System". Follow the conventions.
2. Define a Structure Chart. Draw a Structure Chart for a Payroll Processing System. Also, explain the symbols used in the chart.
3. Define modularity. Describe the ways and means to achieve modularity. Explain with the help of an example.

## Section - B

Short answer questions

Maximum marks: 12

**Note:** Write the answer of four questions in 200 to 300 Words.

4. Write the importance of quality in software development.
5. Define CASE tools. Explain their role
6. With the help of an example, explain a sequence diagram
7. Participatory Design
8. Test Design Document
9. Coupling

