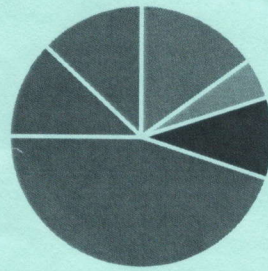


| | |
|-----|---|
| CO1 | Understand the principles and importance of modelling in software development. |
| CO2 | Create conceptual models using UML for effective communication. |
| CO3 | Develop proficiency in basic and advanced structural modelling techniques |
| CO4 | Construct clear and detailed class, object, interface, and package diagrams. |
| CO5 | Apply use case diagrams to capture and represent system functionalities. |
| CO6 | Design and analyze behavioral models including activity diagrams, state machines, and state chart diagrams. |

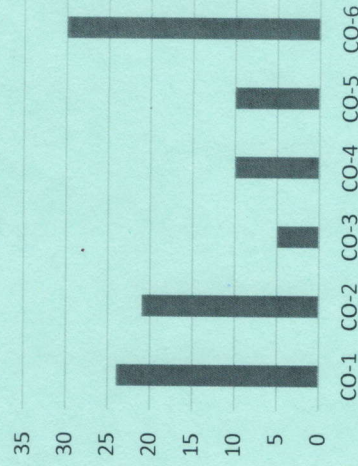
GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome wise Marks Distribution



ARKA JAIN University
Jharkhand



[30/01/2026]
END SEM EXAMINATION
School of Engineering & IT

| | | | |
|--------------|------------------------------|---------|--------------|
| Program | Computer Science Engineering | Branch | Diploma |
| Subject Name | OOAD through UML | Session | Odd, 2025-26 |
| Semester | III | Year | Jan, 2026 |

Time: 3 Hour
Max. Marks: 70

- Start writing from 2nd page onwards; don't Write on the 1st Page Backside
- Answer all Questions of Section A (Compulsory)
- Answer Any Four out of Six of Section B
- Answer Any Three out of Five of Section C
- Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under Unfair Means and will Result in the Cancellation of the Paper(s).

| | | | |
|----------------------|-------------------|---------------|----------------|
| Knowledge Level (KL) | K1: Remembering | K3: Applying | K5: Evaluating |
| | K2: Understanding | K4: Analysing | K6: Creating |

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

| Q.N | QUESTIONS | Marks | COs | KL |
|------|--|-------|-----|----|
| 1 | | | | |
| i | What is the purpose of modelling in software design? | 2 | CO1 | K2 |
| ii | Differentiate between structural and behavioural UML things. | 2 | CO1 | K2 |
| iii | Write any two relationships in UML with examples. | 2 | CO2 | K1 |
| iv | What is the role of association classes in UML? | 2 | CO1 | K2 |
| v | Define events and states in state modelling. | 2 | CO2 | K1 |
| vi | Define component diagram with one example use case. | 2 | CO1 | K1 |
| vii | What are the elements of an activity diagram? | 2 | CO1 | K1 |
| viii | What is the purpose of a use case diagram? | 2 | CO1 | K2 |
| ix | What is a state diagram? | 2 | CO1 | K1 |
| x | Define encapsulation with a simple example. | 2 | CO2 | K1 |

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS | Marks | Cos | KL |
|--------|--|-------|-----|----|
| 2 | Draw a UML diagram to show association, generalization, and realization. | 5 | CO4 | K2 |
| 3 | Explain aggregation vs composition in UML with examples. | 5 | CO2 | K3 |
| 4 | Develop a state diagram for an ATM withdrawal process. | 5 | CO5 | K6 |
| 5 | Differentiate between sequence and communication diagram with examples. | 5 | CO3 | K3 |
| 6 | Explain stages of system development with examples. | 5 | CO1 | K3 |
| 7 | Explain the principles of modelling with suitable examples. | 5 | CO1 | K4 |

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS | Marks | Cos | KL |
|--------|---|-------|-----|----|
| 8 | Construct a complete class diagram for Online Food Ordering System. | 10 | CO6 | K6 |
| 9 | Evaluate importance of abstraction, modularity, and hierarchy in modelling. | 10 | CO2 | K5 |
| 10 | Develop a state diagram for Online Examination System. | 10 | CO6 | K6 |
| 11 | Develop a deployment diagram for an E-Commerce cloud application. | 10 | CO6 | K6 |
| 12 | Construct a use case diagram for Online Banking System. | 10 | CO5 | K6 |

| | |
|-----|---|
| CO1 | Represent the solution of arithmetic and logical problems with simple algorithms and flowcharts. |
| CO2 | Translate the algorithms to programs using C language. |
| CO3 | Decompose a problem into functions and synthesize a complete program using divide and conquer approach. |
| CO4 | Use arrays, pointers, and structures to formulate algorithms and programs |
| CO5 | Apply the acquired knowledge for solving simple computing problems. |

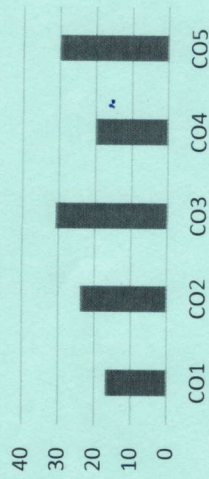
GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



■ CO1 ■ CO2 ■ CO3 ■ CO4 ■ CO5

Course Outcome wise Marks Distribution



ARKA JAIN University
Jharkhand



Program Computer Science & Engineering
Subject Name Computer Programming
Semester III

Branch Diploma
Session Odd, 2025-26
Year Jan, 2026

[17/01/2026]

END SEM EXAMINATION
School of Engineering & IT

• Start writing from 2nd page onwards; don't Write on the 1st Page Backside

- Answer all Questions of Section A (Compulsory)
- Answer Any Four out of Six of Section B
- Answer Any Three out of Five of Section C
- Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under Unfair Means and will Result in the Cancellation of the Paper(s).

Time: 3 Hour
Max. Marks : 70

Knowledge Level (KL)

K1 : Remembering
K2 : Understanding
K3 : Applying
K4 : Analysing
K5 : Evaluating
K6 : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

| Q.N | QUESTIONS | Marks | COs | KL |
|------|--|-------|-----|----|
| 1 | | | | |
| i | Explain with an example how an algorithm differs from a flowchart. | 2 | CO1 | K2 |
| ii | Why is the use of functions important in large C programs? Give an example. Define Arrays in C. | 2 | CO3 | K3 |
| iii | | 2 | CO4 | K2 |
| iv | Differentiate pre increment and post increment. | 2 | CO5 | K2 |
| v | Define data types. | 2 | CO2 | K1 |
| vi | Differentiate while loop and do-while loop. | 2 | CO5 | K1 |
| vii | Explain for loop with example. | 2 | CO5 | K3 |
| viii | What are the different types of functions in C? | 2 | CO3 | K3 |
| ix | What is else if ladder? | 2 | CO2 | K2 |
| x | Define nested for loop. | 2 | CO5 | K2 |

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|---|-------|-----|----|
| 2 | Draw a simple flowchart to find the largest of two numbers. | 5 | CO1 | K2 |
| 3 | What are the steps involved in converting an algorithm into a working C program? | 5 | CO2 | K3 |
| 4 | Explain the concept of recursion in C with an example problem. | 5 | CO3 | K3 |
| 5 | Differentiate between arrays and pointers in C with suitable examples. | 5 | CO4 | K4 |
| 6 | Write a short C program to calculate the factorial of a number using iteration. | 5 | CO5 | K4 |
| 7 | Write the C program for an algorithm that checks whether a given number is even or odd. | 5 | CO2 | K3 |

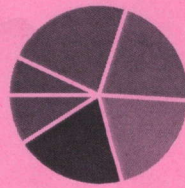
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|---|-------|-----|----|
| 8 | Design a C program to perform the following tasks using functions: Find the largest of n numbers Calculate the sum of all numbers Display all numbers in ascending order | 10 | CO3 | K5 |
| 9 | Take the following scenario: A shopkeeper wants a C program to calculate the total bill amount for a customer, applying a discount of 10% if the total exceeds ₹5000. a) Write a step-by-step algorithm for this problem. b) Convert your algorithm into a C program. | 10 | CO2 | K5 |
| 10 | Design an algorithm to compute the total bill for a customer. Include steps to: Read the price of n items. Apply a discount of 10% if the total exceeds ₹1000. Add 5% tax on the discounted total. | 10 | CO1 | K5 |
| 11 | Write a C program to perform the addition, subtraction, multiplication, and division of two numbers using separate functions for each operation. | 10 | CO3 | K3 |
| 12 | A company wants to calculate the gross salary of its employees. The gross salary is computed as: gross_salary = basic_salary + HRA + DA – tax Design a C program to solve this problem. Explain the algorithm, flowchart, and C program logic in detail. | 10 | CO5 | K4 |

| | |
|-----|--|
| CO1 | have a broad understanding of database concepts and database management system software |
| CO2 | have a high-level understanding of major DBMS components and their function |
| CO3 | be able to model an application's data requirements using conceptual modelling tools like ER diagrams and design database schemas based on the conceptual model. |
| CO4 | be able to write SQL commands to create tables and indexes, insert/update/delete data and query data in a relational DBMS. |
| CO5 | be able to program a data-intensive application using DBMS APIs. |

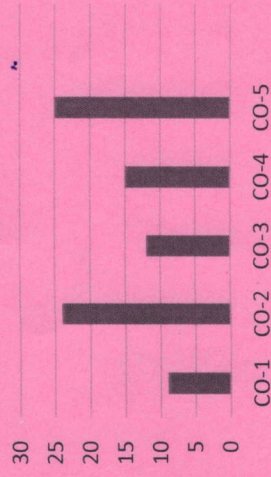
GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome wise Marks Distribution



| | | | |
|---------------------------------|---|---------------------------------|----------------------------------|
| Program | Computer Science Engineering | Branch | Diploma |
| Subject Name | Introduction to DBMS | Session | Odd, 2025-26 |
| Semester | III | Year | Jan, 2026 |
| Time: 3 Hour Max. Marks : 70 | <ul style="list-style-type: none"> Start writing from 2nd page onwards; don't Write on the 1st Page Backside Answer all Questions of Section A (Compulsory) Answer Any Four out of Six of Section B Answer Any Three out of Five of Section C Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under Unfair Means and will Result in the Cancellation of the Paper(s). | | |
| Knowledge Level (KL) | K1 : Remembering K2 : Understanding | K3 : Applying K4 : Analysing | K5 : Evaluating K6 : Creating |

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

| Q.N | QUESTIONS | Marks | COs | KL |
|------|---|-------|-----|-----|
| 1 | | | | |
| i | Define the characteristics of DBMS? | 2 | CO1 | KL1 |
| ii | Illustrate DBMS? | 2 | CO1 | KL4 |
| iii | List the Three Level Architecture of DBMS. | 2 | CO2 | KL1 |
| iv | Explain Conceptual level in Three Level Architecture of DBMS? | 2 | CO2 | KL2 |
| v | List the components of a DBMS. | 2 | CO3 | KL1 |
| vi | Differentiate between Strong and Weak Entity. | 2 | CO3 | KL4 |
| vii | Define ER Model. | 2 | CO4 | KL1 |
| viii | Explain the types of Data Models in DBMS? | 2 | CO5 | KL2 |
| ix | Define physical Data Model? | 2 | CO5 | KL1 |
| x | Define the term Transaction. | 2 | CO3 | KL1 |

Section B (Answer any FOUR out of SIX) - 20 Marks
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS | Marks | Cos | KL |
|--------|---|-------|-----|-----|
| 2 | Explain the term Attribute and define the types of Attribute? | 5 | CO2 | KL2 |
| 3 | List all the Types of Relationship with examples. | 5 | CO1 | KL1 |
| 4 | Illustrate the steps to create ER Diagram. | 5 | CO3 | KL4 |
| 5 | Describe Relational Model in DBMS. | 5 | CO5 | KL4 |
| 6 | Differentiate between Relational and Non-Relational Database. | 5 | CO3 | KL4 |
| 7 | Explain the terminologies used in Relational Model. | 5 | CO5 | KL2 |

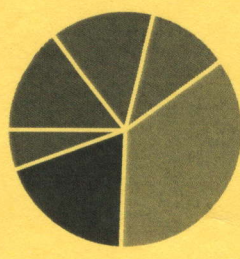
Section C (Answer any THREE out of FIVE) - 30 Marks
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|--|-------|-----|-----|
| 8 | Give a brief description of popular Relational Database. | 10 | CO5 | KL1 |
| 9 | Define the term Union Operation. Give any two examples. | 10 | CO5 | KL1 |
| 10 | Explain the types of Join Operation. | 10 | CO2 | KL2 |
| 11 | Briefly explain Cartesian Product. | 10 | CO2 | KL2 |
| 12 | Illustrate Total Participation of an Entity Set? | 10 | CO3 | KL4 |

| | | |
|-----------------|-----|--|
| Course Outcomes | CO1 | Students will have good understanding of various aspect |
| | CO2 | Understand and know some tools and have basic implementation skills. |
| | CO3 | Understand the process of Analog to Digital conversion and Digital to Analog conversion. |
| | CO4 | Be able to use PLDs to implement the given logical problem. |

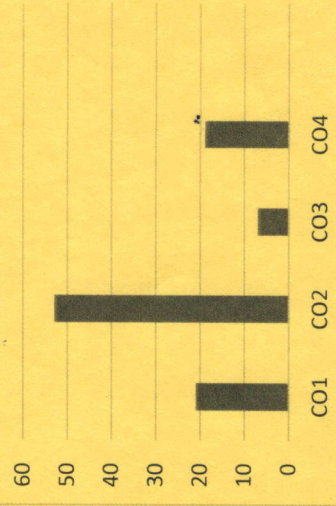
GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome Wise Marks Distribution



| | | | | | |
|--|--------------------------------|--|--------------|---|--|
| | | | | [22/01/2026] END SEM EXAMINATION School of Engineering & IT | |
| Program | Computer Science & Engineering | Branch | Diploma | | |
| Subject Name | Digital Logic Design | Session | Odd, 2025-26 | | |
| Semester | III | Year | Jan, 2026 | | |
| • Start writing from 2nd page onwards; don't Write on the 1st Page # Backside • Answer all Questions of Section A (Compulsory) • Answer Any Four out of Six of Section B • Answer Any Three out of Five of Section C • Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will comes under Unfair Means and will Result in the Cancellation of the Paper(s). | | | | | |
| Time: 3 Hour Max. Marks : 70 | | K1 : Remembering K2 : Understanding | | K3 : Applying K4 : Analysing K5 : Evaluating K6 : Creating | |
| Knowledge Level (KL) | | | | | |

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

| Q. N | QUESTIONS | Marks | COs | KL |
|------|---|-------|-----|----|
| i | Write the 1's complement of 10110100. | 2 | CO1 | K1 |
| ii | What is a signed binary number? Give an example. | 2 | CO2 | K2 |
| iii | List any two applications of binary codes. | 2 | CO2 | K1 |
| iv | State the Axiomatic definition of Boolean Algebra. | 2 | CO3 | K3 |
| v | Write the canonical SOP form of $Y = AB + A'C$. | 2 | CO1 | K3 |
| vi | Give one example of an Exclusive-OR function. | 2 | CO2 | K1 |
| vii | What is a Don't-care condition in K-map? | 2 | CO2 | K1 |
| viii | Differentiate between NAND and NOR gate implementation. | 2 | CO1 | K4 |
| ix | Define a multiplexer. Write its basic function. | 2 | CO4 | K1 |
| x | State the difference between Decoder and Encoder. | 2 | CO4 | K1 |

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|---|-------|-----|----|
| 2 | State and prove any three Boolean algebra theorems. | 5 | CO3 | K5 |
| 3 | Derive and simplify a Boolean function using K-map (4 variables). | 5 | CO2 | K2 |
| 4 | Minimize $Y(A,B,C,D) = \sum m(1,3,5,7,8,11)$ using K-map. | 5 | CO2 | K1 |
| 5 | Explain state reduction and assignment procedure for sequential circuits. | 5 | CO2 | K6 |
| 6 | Describe the working of a Shift Register with neat diagram. | 5 | CO4 | K6 |
| 7 | What is memory decoding? Design a 3-to-8 decoder for RAM address selection. | 5 | CO1 | K6 |

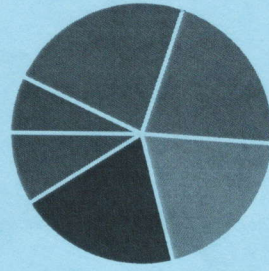
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|---|-------|-----|----|
| 8 | Implement a 4×1 multiplexer using basic gates. | 10 | CO2 | K4 |
| 9 | Write short notes on two-level implementation. Explain the difference between SOP and POS forms in two-level realization. | 10 | CO1 | K5 |
| 10 | Explain the operation of SR, JK, and T flip-flops with diagrams. | 10 | CO2 | K6 |
| 11 | What are don't-care conditions? Simplify the function $F(A, B, C) = \sum(1,3,7) + d(2,5)$ using K-map. | 10 | CO4 | K3 |
| 12 | Simplify and implement the function $F(A, B, C, D) = \sum(1,3,7,11,15)$ using two-level logic. | 10 | CO2 | K6 |

| | |
|-----|--|
| CO1 | To interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements. |
| CO2 | The student will be able to express proficiency in the handling of strings and functions. |
| CO3 | Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets. |
| CO4 | Identify, write, and apply regular expressions effectively to solve text processing problems, validate patterns, and extract relevant information from data. |
| CO5 | Design and perform commonly used operations involving file systems, including reading, writing, and managing files efficiently in Python. |

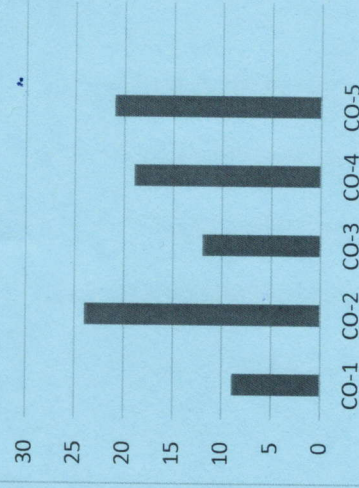
GRAPHICAL REPRESENTATION


Bloom's level wise Marks Distribution




■ K1 ■ K2 ■ K3 ■ K4 ■ K5 ■ K6

Course Outcome wise Marks Distribution





ARKA JAIN University
Jharkhand



[28/01/2026]
END SEM EXAMINATION
School of Engineering & IT

| | | | |
|---------------------|--------------------------------|---------|--------------|
| Program | Computer Science & Engineering | Branch | Diploma |
| Subject Name | Scripting Language (Python) | Session | Odd, 2025-26 |
| Semester | III | Year | Jan, 2026 |

• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**

- Answer all Questions of Section A (Compulsory)
- Answer Any Four out of Six of Section B
- Answer Any Three out of Five of Section C
- Possession of Mobile Phone or any kind of Written Material, Arguments with the Invigilator or Discussion with Co-Student will come under Unfair Means and will Result in the Cancellation of the Paper(s).

| | | |
|--------------------|----------------|-----------------|
| K1 : Remembering | K3 : Applying | K5 : Evaluating |
| K2 : Understanding | K4 : Analysing | K6 : Creating |

Time: 3 Hour
Max. Marks : 70

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

| Q.N | QUESTIONS | Marks | COs | KL |
|------|--|-------|-----|----|
| 1 | What is the difference between a comment and a docstring in Python? | 2 | CO1 | K2 |
| i | Write a Python expression to concatenate two strings: "Issac" and "Newton", with a space in between. | 2 | CO1 | K3 |
| ii | What is a function in Python? Give one simple example. | 2 | CO2 | K2 |
| iii | Explain the difference between a parameter and an argument in Python. | 2 | CO2 | K2 |
| iv | Define a dictionary in Python. List any two advantages of using dictionaries. | 2 | CO3 | K1 |
| v | Explain how dictionaries are different from lists. Give suitable examples. | 2 | CO3 | K3 |
| vi | What is a regular expression in Python? | 2 | CO4 | K1 |
| vii | Explain the use of the *, + and ? quantifiers in regex. Give one example. | 2 | CO4 | K3 |
| viii | Define a file in Python with example. | 2 | CO5 | K2 |
| ix | Explain the different file modes, such as 'r', 'w', 'a', and 'x', and their purposes. | 2 | CO5 | K2 |
| x | | | | |

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|--|-------|-----|----|
| 2 | Write a Python program that imports the sys module and exits the program if a user inputs the string "quit". | 5 | CO1 | K4 |
| 3 | Write a Python function that tries to divide two numbers entered by the user. Handle the ZeroDivisionError exception and print a proper message. | 5 | CO2 | K4 |
| 4 | Explain the different dictionary methods available in Python with suitable examples demonstrating their usage. | 5 | CO3 | K3 |
| 5 | Explain the difference between re.match() and re.findall() with examples. | 5 | CO4 | K2 |
| 6 | Write a Python program to create a text file and write multiple lines into it. | 5 | CO5 | K3 |
| 7 | Explain various control statements used in Python with proper syntax of each. | 5 | CO1 | K2 |

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

| Q. No. | QUESTIONS | Marks | COs | KL |
|--------|--|-------|-----|----|
| 8 | Explain why a program might behave differently if a string is used instead of an integer in a comparison operation, and develop a Python program that keeps asking for a number until the user enters a value between 1 and 100 using a while loop. | 10 | CO1 | K5 |
| 9 | Differentiate between list and tuple in Python with at least three points. Provide one example of each and write a program that uses a function to merge two lists and removes duplicates from the merged list. | 10 | CO2 | K4 |
| 10 | Write a Python program to create a new dictionary with the opposite mapping (swap keys and values). Input: x = {'k1': 'v1', 'k2': 'v2', 'k3': 'v3'} Output: inverted_x = {'v1': 'k1', 'v2': 'k2', 'v3': 'k3'} | 10 | CO3 | K3 |
| 11 | Write a Python program that accepts two string inputs where first string is sentence and second string is an email. From first string extract all words that start with a capital letter and check if a second string is a valid email address or not. | 10 | CO4 | K5 |
| 12 | Explain the use of the os.path module in Python mentioning three commonly used functions with | 10 | CO5 | K4 |

examples, and discuss the difference between os and os.path modules along with methods of the os module.