



**MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
SCHOOL OF COMPUTER SCIENCE & ENGINEERING
Odd Semester Examinations 2022-23**

Paper Code: PCC-CS301

Paper Name: Principles of Programming Languages

Time Allotted : 3 Hours

Full Marks : 70

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions

Section A [Marks: 10 x 1 = 10]

Very Short Answer Type Questions: Answer ALL questions

[CO1][BL2][POs: 1, 2, 3, 12]

1. Name some base (primitive) types available in SML.
2. Give an example of an 'each-of' type, a 'one-of' type in SML.
3. State the more commonly used names for the following kinds of compound data types: 'each-of', 'one-of', 'self-reference' types.
4. What kind of compound data type is the following SML type:
`(int * bool) list list * (int option) list * bool`
5. Give an example of the following SML record type:
`{foo: int, bar: int*bool, baz: bool*int}`
6. Give an example of a 'binding' in any programming language we have covered in this course.
7. Is the following SML code snippet considered a binding? Why?
`let fun trip y = 3 * y in trip end`
8. Is the following SML code snippet considered a binding? Why?
`fun trip y = 3 * y`
9. Define 'lexical scope'
10. What does 'functions have first class status' mean?

Section B [Marks: 3 x 5 = 15]

Short Answer Type Questions: Answer ALL Questions.

Each Question has an [A] part and a [B] part. You are to answer ANY ONE of them (for each question).

1. [CO1][POs: 1, 2, 3, 12]

Answer either [A] or [B]

[A][BL3][Marks:5] Derive the type of the following SML function:

```
fun n_time (f, n, x) =  
  if n=0  
  then x  
  else f (n_time(f, n-1, x))
```

R: n -> x
+ -> list

[B][BL3][Marks:5] The type of a function f (in SML type notation) is

('a * 'b -> 'a) * 'a * 'b list -> 'a

Is the function f a curried function? Justify your answer.

If f is a curried function, what would the type be for the non-curried version of the function?

If f is not a curried function, what would the type be for the curried version of the function?

2. [CO2][POs: 1, 2, 3, 5, 12]

Answer either [A] or [B]

[A][BL3][Marks:5] Is the following SML function tail recursive? Justify your answer.

```
fun sum1 xs =  
  case xs of  
    [] => 0  
  | i::xs' => i + sum1 xs';
```

If the above function is not tail recursive, then modify this function so that it becomes tail recursive.

[B][BL3][Marks:5] What will the following SML code evaluate to for z (in the last line)? Justify your answer. (Proper justification is more important than the answer itself)

```
val x = 2  
fun f y =  
  let val x = y + 3  
  in  
    fn z => x + y - z  
  end;  
val x = 10  
val g = f 10  
val y = 6  
val z = g 6
```

3. [CO3][POs: 1, 2, 3, 5, 12]

Answer either [A] or [B]

[A][Marks:1+4=5] Answer the following questions:

(a)[BL2] What is a 'thunk'? Why is it useful?

(b)[BL3] Consider the following Racket code snippet:

```
(define x (+ 3 2))
```

Is the above code a thunk? Give proper reasons for your answer. If it's not a thunk, rewrite the code in Racket so that it becomes a thunk.

[B][Marks:1+4=5] Answer the following questions:

(a)[BL2] What is a 'promise'? Why is it useful?

(b)[BL3] Consider the following Racket code snippet:

```
(define x (* 10 20))
```

Is the above code a promise? Give proper reasons for your answer. If it's not a promise, rewrite the code in Racket so that it becomes a promise.

Section C [Marks: 3 x 15 = 45]

Longer Answer Type Questions: Answer ALL Questions.

Each Question has an [A] part and a [B] part. You are to answer ANY ONE of them (for each question).

1. [CO4][POs: 1, 2, 3, 5, 12]

Read the following problem statement **very carefully** before attempting either [A] or [B]:

PROBLEM STATEMENT FOR [A] AND [B]:

You are to write Python code to implement two subclasses - **MyInt** and **MyString** - of the **Expression** class (where **Expression** class is just an empty class and indicates that **MyInt** and **MyString** are Expressions).

A **MyInt** object will hold an integer **i** (as instance variable). A **MyString** object will hold a string **s** (as instance variable).

Implement the `__repr__` methods for **MyInt and **MyString**** (so that objects of **MyInt** and **MyString** will show their underlying **i** and **s** instance variables as strings respectively when printed or displayed on screen).

Implement the addition operation (by implementing the `__add__` methods in **MyInt** and **MyString**) so that any combination of the objects of subclasses of the **Expression** class may be added together using the '+' operator.

Remember that `__add__` method takes a single parameter (other than the implicit `self`) that is to be "added to" `self`. For our case, this parameter should be either **MyInt** or **MyString**. Your code **must raise a custom exception `InvalidInputException`** if this is not the case).

The behavior of the objects of your classes after being properly implemented as per problem statement should be as follows:

(A sample run of the code in a python3 interactive session is shown below assuming your code is saved in a file named `solution.py`)

```
>>> import solution as sol
>>> x,y=sol.MyInt(345),sol.MyString(" well ")
>>> x
345
```

Not applicable

```
>>> y
well
>>> (x+x, x+y, y+x, y+y)
(690, 345 well , well 345, well well )
>>> type(x+x)
<class 'sol.MyInt'>
>>> type(x+y)
<class 'sol.MyString'>
>>> type(y+x)
<class 'sol.MyString'>
>>> type(y+y)
<class 'sol.MyString'>
```

[A] [Marks: 3+12=15] Answer the following questions:

- (a) [BL2] What is double dispatch? When is this OOP technique useful?
(b) [BL4] Write properly indented Python code to solve the problem mentioned in the above 'PROBLEM STATEMENT' using "full" OOP paradigm. This essentially means you must use **double dispatch** to properly implement the addition operation.

[B] Answer the following questions: [Marks: 3 + 12 = 15]

- (a) [BL2] What is "Late Binding" in OOP? Why is this feature important in class based OOP languages?
(b) [BL4] Write proper indented Python code to solve the problem mentioned in the above 'PROBLEM STATEMENT' **without using** double dispatch at all. Only single dispatch is allowed.

2. **[CO3]** [POs: 1, 2, 3, 5, 12]

Answer either [A] or [B]

[A] [Marks: 7+8=15]

Write Racket code for the following:

- (a) [BL4] Write a Racket function **next-prime** that takes a positive integer and returns the least prime number which is not less than the given positive integer.
(b) [BL4] Use the help of the **next-prime** function to write Racket code to produce a prime number **stream**.

[B] [Marks: 8+7=15]

Assume that we have a prime number **stream** named **pstream**.

- (a) [BL4] Write a Racket function **sum-first-n** that takes a positive integer **n** and a **stream** as its two arguments and returns the sum of the first **n** members of the sequence represented by the given **stream**. (Assume that the given **stream** produces a stream of integers).

(b) [BL4] Use the function **sum-first-n** you wrote in (a) above and the **pstream** **stream** to write Racket code to produce a **promise** named **promised-sum** that will sum the first 1000 prime numbers. Please keep in mind that **promised-sum** MUST have

the properties of a promise for your code to be considered a correct answer.

3. [CO2][POs: 1, 2, 3, 5, 12]

Answer either [A] or [B]

[A][Marks:6+5+4=15]

(a)[BL3] Write SML code for the well known higher order functions `foldl` and `foldr`.

(b)[BL3] Given a function f and a list $l = [1, 2, 3, 4, 5, 6, 7]$, show the shape of the computation (i.e., the shape of the final result) obtained by calling:

(i) `foldl f @ l`

(ii) `foldr f @ l`

(c)[BL4] Looking at the shape of the two computations from (b) above, which of `foldl` and `foldr` should be preferred for a non-lazy functional programming language such as SML? Justify your answer.

[B][Marks:8+4+3=15]

(a)[BL4] Write an SML function `next` that works as follows:

```
[] -> [1]
[a] -> [a, a]
[a, b, c] -> [a, (a+b), (b+c), c]
[a, b, ..., c, d] -> [a, (a+b), ..., (c+d), d]
```

Here a, b, c, d , etc. are positive integers. Given the input as represented by the list on the left side of $->$, the output is as given on the right side of $->$.

(b)[BL3] Write an SML higher order function `n_times` which takes as inputs a function f , a list v , and a non-negative integer n . It applies f to v n times. Assume that f takes a list of type V and returns another list of the same type.

(c)[BL3] What would be the output of the following function call:

```
n_times next [] 5;
```

Handwritten notes:
f [1]
[1, 1]
[1, 2, 1]
[1, 3, 3, 1]
[1, 4, 6, 4, 1]



MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY ,WEST BENGAL
SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
Odd Semester Examination 2022-2023

PAPER CODE: PCC-CS302

Time Allotted: 3 Hours

PAPER NAME: Data Structure and Algorithm

Full Marks: 70

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

1		Choose the correct alternatives of the following :	10 X 1 = 10			
			MARK S	C O	PO	B L
i)		_____ is a step-by-step recipe for solving an instance of problem.	1	1	1,2,3, ,4,5	1
a.	Complexity					
b.	Algorithm					
c.	Pseudocode					
d.	Analysis					
ii)		_____ is used to describe the algorithm, in less formal language.	1	1	1,2,3, ,4,5	1
a.	Natural Language					
b.	Can not be defined					
c.	Pseudocode					
d.	None of these					
iii)		_____ of an algorithm is the amount of time needed by the algorithm to complete its task.	1	1	1,2,3 ,4,5	1
a.	Time Complexity					
b.	Space Complexity					
c.	Coding Complexity					
d.	None of these					
iv)		Which among the following is a linear data structure ?	1	1	1,2,3 ,4,5	1
a.	Queue					
b.	Stack					
c.	Linked List					
d.	All of these					

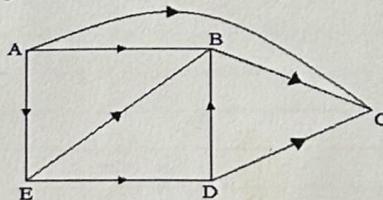
v)	Which one of the following is the correct way to increment the rear end in a circular queue?	1	2	1,2,3 ,4,5	2
a.	rear = rear+1				
b.	rear=(rear+1) % max				
c.	rear=(rear % max) + 1				
d.	None of these				
vi)	The postfix form of A*B+C/D is	1	2	1,2,3 ,4,5	2
a.	ABCD+/*				
b.	AB*CD/+				
c.	AB*C/D+				
d.	AB*C+D/				
vii)	What data structure is used for depth first traversal of a graph?	1	3	1,2,3 ,4,5	1
a.	Queue				
b.	Stack				
c.	Linked List				
d.	None of these				
viii)	In which traversal root node is visited at the last ?	1	3	1,2,3 ,4,5	1
a.	Post-order traversal				
b.	Pre-order traversal				
c.	In-order traversal				
d.	None of these				
ix)	The complexity of Bubble sort algorithm is	1	4	1,2,3 ,4,5	1
a.	$O(n)$				
b.	$O(\log n)$				
c.	$O(n \log n)$				
d.	$O(n^2)$				
x)	Which of the following is not a collision resolution strategy for open addressing?	1	4	1,2,3 ,4,5	1
a.	Linear probing				
b.	Quadratic probing				
c.	Double hashing				
d.	Rehashing				

GROUP – B
(Short Answer Type Questions)

Answer the following.

 $3 \times 5 = 15$

	MARK S	C O	P O	B L

2.a.	What is an algorithm? Describe the characteristics of a good algorithm?	5	1	1,2,3 ,4,5	2
2.b.	How do you find the complexity of an algorithm? What is the relation between the time and space complexities of an algorithm?	5	1	1,2,3 ,4,5	2
3.a.	Write a C program to Add following two polynomials $10X^5 + 25X^3 + 20X + 50$ and $12X^5 + 15X^4 + 2X^2 - 5X + 30$	5	5	1,2,3 ,4,5, 12	3
3.b.	Write a C program to print 100 th Fibonacci number.	5	5	1,2,3 ,4,5, 12	3
4.a.	Construct a binary tree whose nodes in inorder and preorder are given as follows: Inorder : 10, 15, 17, 18, 20, 25, 30, 35, 38, 40, 50 Preorder: 20, 15, 10, 18, 17, 30, 25, 40, 35, 38, 50	5	3	1,2,3 ,4,5	3
4.b.	Draw a picture of the directed graph specified below: $G = (V, E)$ $V(G) = \{1, 2, 3, 4, 5, 6\}$ $E(G) = \{(1,2), (2,3), (3,4), (5,1), (5,6), (2,6), (1,6), (4,6), (2,4)\}$ Obtain the Adjacency matrix for the above graph.	5	3	1,2,3 ,4,5	3
GROUP – C (Long Answer Type Questions)					
Answer the following.		3 X 15 = 45			
		MARK S	C O	PO	B L
5.a.i.	What is a Binary Search Tree (BST)? Make a BST for the following sequence of numbers: 45, 36, 76, 23, 89, 115, 98, 39, 41, 56, 69, 48. Traverse the above tree in Preorder, Inorder and postorder.	2+4+3	3	1,2,3, ,4,5	3
ii.	Represent the following expression using a expression tree: $(a-b) / ((c*d)+e)$ Comment on the result that you get when this tree is traversed in Preorder, Inorder and postorder.	3+3	3	1,2,3, ,4,5	3
5.b.i.	What are the different ways of representing a graph? Represent the following graph using those ways.	5+6	3	1,2,3 ,4,5	3
ii.		4	3	1,2,3 ,4,5	3
6.a.i.	What is the worst case time complexity of quick sort? Sort the following	1 + 7	4	1,2,3	3

	array using quick sort method. 24, 56, 47, 35, 10, 90, 82, 31, 50, 42			,4,5	
ii.	Describe insertion sort with a proper algorithm. What is the time complexity of insertion sort in the best case?	6+1	4	1,2,3 ,4,5	3

OR

6.b.i.	What do you mean by hashing? Explain any three popular hash functions.	2+3	4	1,2,3 ,4,5	2
ii.	How do collisions happen during hashing? Explain the different techniques for resolving of collision.	2+4	4	1,2,3 ,4,5	2
iii.	The following values are to be stored in a hash table 25, 42, 96, 101, 102, 162, 197 Describe how the values are hashed by using division method of hashing with a table size of 7. Use chaining as the method of collision resolution.	4	4	1,2,3 ,4,5	3

7.a.i.	Define the term array. How are two-dimensional arrays represented in memory?	1 + 4	2	1,2,3 ,4,5	2
ii.	A two dimensional integer array TABLE [6] [8] is stored in memory with base address 351 and integer size= 4 byte. Finds the address of TABLE [3] [4] in row major and column major order method.	4	2	1,2,3 ,4,5	3
iii.	Execute your algorithm to convert an infix expression to a post fix expression with the following infix expression : $(m + n)*(k + p) / (g / b) ^ (a ^ b / c)$	6	2	1,2,3 ,4,5	3

OR

7.b.i.	Two linked lists contain information of the same type in ascending order. Write a C program to merge them to a single linked list that is sorted.	6	2	1,2,3 ,4,5	3
ii.	Write an algorithm to insert a node in the beginning of the linked list.	5	2	1,2,3 ,4,5	3
iii.	Execute your algorithm to evaluate the following postfix expression with the values a=5, b=3, c=6, d=4, f=2 Postfix expression: a b - c d - * f ^	4	2	1,2,3 ,4,5	3



MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
SCHOOL OF COMPUTER SCIENCE & ENGINEERING

Odd Semester Examinations 2022-23

Course Name: B. Tech CSE

Paper Code: ESC301

Paper Name: Digital Electronics

Time Allotted :3 Hours

Full Marks : 70

~~10 11
11 10~~

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions

Sl. No.	Questions	Marks	Mapped CO	Mapped PO	Bloom's Level
Group A(Multiple Choice/Objective Type Questions)					10 x 1 = 10
1.					
i)	Compute the value of the Boolean no $(10110011100011110000)_2$ in base 32?	1	1		2
ii)	Find out the Binary equivalent of the gray code 11100.	1	1		2
iii)	Write down the binary equivalent of the decimal no 0.4375.	1	1		2
iv)	What is the main advantage of the R-2R ladder network compare to the weighted binary registrar network for converting Digital to Analogue signal.	1	3		2
v)	How many 4X8 memory units will be required to construct a 16X16 memory unit?	1	4		3
vi)	Minimum number of 2-input NAND gates required to implement a 2-input XOR gate	1	2		3

	is.....				
vii)	A bulb in a staircase has two switches, one switch being on the ground floor and the other one on the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches, irrespective of the state of the other switch. The logic of switching of the bulb resembles.	1	2		1
viii)	In a DRAM,	1	4		1
	a. Periodic refreshing is not required b. Information is stored in a capacitor c. Information is stored in a latch d. Both read and write operations can be performed simultaneously				
ix)	Register is _____ circuit.	1	4		1
x)	ENCODER is reverse of _____ combinational circuit.	1	3		1

Group B(Short Answer Type Questions) **$3 \times 5 = 15$**

2. A)	What are the advantages of digital computers compare to analogue computer? Define the minterm & max term.	2+3	1		1
OR 2. B)	Write down the Huntington postulate of the Boolean algebra?	5	1		1
3. A)	What do you mean by the universal gate? Explain any of the error <u>correcting</u> codes <u>detecting</u> with examples	1+4	2		2
OR 3. B)	Explain the gray code. Why is it called as self-reflecting code? Draw the circuit for converting binary to gray code.	2+1+2	2		2
4. A)	Convert JK flip-flop into D flip-flop	5	4		2
OR 4. B)	Draw a timing Diagram of 4 bit Ring Counter	5	4		2

Group C(Long Answer Type Questions)			3 x 15=45		
5. A)	Construct XNOR and NAND gates using 2x1 MUX only. Using QM realize $F(w,x,y,z) = \sum(0,3,4,6,7,8,12,15)$ $\emptyset(2,5,9,13)$	(2+2)+11	4		3
OR 5. B)	What is excess three code? Convert BCD to Excess 3 and vice versa.	1+(7+7)	3		1,3
6. A)	i) Write down the applications (at least two) of analogue to digital conversion. ii) Draw and explain the R-2R ladder network based 4bit digital to analogue converter. iii) Draw and explain the construction of 32 X16 memory block using the 4X4 memory blocks and suitable logic gates.	1+7+7	3,4		1,2,3
OR 6. B)	i) Write down the applications (at least two) of digital to analogue conversion. ii) Draw and explain the analogue to 4 bit digital converter using Successive Approximation method. iii) Draw and explain the construction of a 64 X 8 memory block using the 4X4 memory blocks and suitable logic gates	1+7+7	3,4		1,2,3
7. A)	i) Design a Full subtractor using two half subtractors. ii) Design 3 bit parallel adder-subtractor composite unit. iii) Design a 5x32 decoder using 2x4 and 3x8 decoders.	5+5+5	4		1,3,4
OR 7. B)	i) Design a Serial Adder using JK Flip-Flop. ii) Construct a ripple decade up-down counter	7+8	4		3,4



MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY ,WEST BENGAL
SCHOOL OF COMPUTER SCIENCE & ENGINEERING

Odd Semester Examinations 2022-23

Paper Code: PCC-CS303

Paper Name: IT-Workshop(Python/R/MATLAB/Sci Lab)

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions

Sl. No.	Questions	Marks	Mapped CO	Mapped PO	Bloom's Level
Group A(Multiple Choice Type Questions) $10 \times 1 = 10$					
1.	What is the output of the following program? data = [x for x in range(5)] temp = [x for x in range(7) if x in data and x%2==0] print(temp)	1	CO1	1,2,3,4,5	2
i)	[0, 2, 4, 6]				
ii)	[0, 2, 4]				
iii)	[0, 1, 2, 3, 4, 5]				
iv)	Runtime error				
2.	The readlines() method returns _____	1	CO4	1,2,3,4,5	1
i)	Str				
ii)	a list of lines				
iii)	a list of single characters				
iv)	a list of integers				
3.	What is the output of the following program? T = (1, 2, 3, 4, 5, 6, 7, 8) print(T[T[6]-3])	1	CO3	1,2,3,4,5	2
i)	3				
ii)	8				
iii)	1				
iv)	2				
4.	What is the output of the following program? D = dict() for i in range (3): for j in range(2): D[i] = j print(D)	1	CO3	1,2,3,4,5	2

i)	{0: 0, 1: 0, 2: 0}				
ii)	{0: 0, 1: 0, 2: 0, 0: 1, 1: 1, 2: 1}				
iii)	{0: 1, 1: 1, 2: 1}				
iv)	Compilation error				
5.	What is the output of the following program? tuple = (1, 2, 3, 4) tuple.append((5, 6, 7)) print(len(my_tuple))	1	CO3	1,2,3,4,5	2
i)	1				
ii)	2				
iii)	5				
iv)	Error				
6.	What is the output of the following program? tuple = (1, 2, 3) print(2 * tuple)	1	CO3	1,2,3,4,5	2
i)	(1, 2, 3, 1, 2, 3)				
ii)	(1, 2, 3, 4, 5, 6)				
iii)	(3, 6, 9)				
iv)	Error				
7.	What is the output of the following program? list = [1, 2, 3, None, (1, 2, 3, 4, 5), ['G', 'for', 'A']] print(len(list))	1	CO3	1,2,3,4,5	2
i)	6				
ii)	7				
iii)	5				
iv)	4				
8.	What is the output of the following program? list = ['python', 'learning', '@', 'A', 'for', 'abc'] print(list[::-2])	1	CO3	1,2,3,4,5	2
i)	['for']				
ii)	['for', 'abc']				
iii)	Compilation error				
iv)	['abc', 'A', 'learning']				
9.	What is the output of the following program? t = (1, 2) print(2 * t)	1	CO3	1,2,3,4,5	2
i)	(1, 2)				
ii)	(2,4)				
iii)	(1, 2, 1, 2)				
iv)	Compilation error				
10.	Which function open file in Python?	1	CO4	1,2,3,4,5	2
i)	open()				
ii)	new()				
iii)	Open()				
iv)	Error				

Group B(Short Answer Type Questions)

3 x 5 = 15

2. A)	Write Python code to print a list of 10 randomly generated 5 character strings. Your code MUST use list comprehension. You may use the 'choice' function from the 'random' python library.	5	CO3	1,2,3,4,5	3
OR 2. B)	Write a Python function that takes a list of strings and returns (not prints) a list of positive integers representing the lengths of the corresponding strings in the input list. The list of strings must be obtained as the function input, NOT interactively from user. Also, your function must use list comprehension to produce the result.	5	CO3	1,2,3,4,5	3
3. A)	Write a Python function that takes a string and returns a string containing only the vowels in the input string. For example, if the input string to your function is "hello", then the output string from this function should be "eo".	5	CO2	1,2,3,4,5	3
OR 3. B)	Write a Python function that takes a string and returns an integer representing the number of consonants in the input string. For example, if the input string is "hello", then the output from your function should be 3 (since there are 3 consonants).	5	CO2	1,2,3,4,5	3
4. A)	Write 5 test cases for the function in 2(a) above. Make sure that the test cases run ONLY if the program file is run directly using Python, but NOT if the file is imported as a module in another Python program.	5	CO1	1,2,3,4,5	3
OR 4. B)	Write 5 test cases for the function in 2(b) above. Make sure that the test cases run ONLY if the program file is run directly using Python, but NOT if the file is imported as a module in another Python program.	5	CO1	1,2,3,4,5	3

Group C(Long Answer Type Questions)

3 x 15=45

5. A)i)	What is <code>__init__</code> in Python?	2	CO1	1,2,3,4,5	1
ii)	Write down the differences between break, continue, and pass.	5	CO1	1,2,3,4,5	4
iii)	What is the purpose of is, not and in operators?	3	CO1	1,2,3,4,5	2
iv)	Write a python program for the following pattern. 1 2 2 3 3 3 4 4 4 4 5 5 5 5 5	5	CO1	1,2,3,4,5	3
OR 5. B)i)	How can the ternary operators be used in Python?	3	CO1	1,2,3,4,5	1
ii)	Write down the key features of Python.	5	CO1	1,2,3,4,5	1
iii)	What is the difference between / and // operator in Python?	2	CO1	1,2,3,4,5	1

iv)	<p>Write a python program for the following pattern.</p> <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</p>	5	CO1	1,2,3,4,5	3
6.	<p>Each of the following questions has two parts (A) and (B). You need to answer any one of them (NOT both).</p> <p>You are given a text file named QandA.txt which has the following format:</p> <ul style="list-style-type: none"> • A line of text starts with either 'Q' (i.e., the character Q followed by a space character, but not the quotes) or 'A'. • A line starting with 'Q' represents a single line question. • A line starting with 'A' represents a single line numeric answer to the immediately preceding question. • There may be any number of blank lines containing zero or more space characters but nothing else. <p>Based on the above text file format, answer either (A) or (B). Remember, your Python code's correctness heavily depends (among other things) on proper indentation.</p>				
6.A)	<p>Write a Python program that will perform the following operations:</p> <ol style="list-style-type: none"> (1) Define a custom exception called InvalidQuestionAnswerFormatException. (2) Read the above text file and check if the file is valid. In a valid file (of the above format), every line starts with either 'Q' or 'A' or it is a blank line. Also if a question does not have a corresponding answer or vice versa, then the file is invalid. If the file is invalid, then your program should raise the exception InvalidQuestionAnswerFormatException and exit. (3) If the file is valid, then your program should return True (not print 'True'). (4) Make sure that your program closes the file before exiting (regardless of whether or not the file is valid or invalid). 	15	CO4	1,2,3,4,5	3&4
OR 6. B)	<p>Assume that the solution code for (A) above is in a file called validitychecker.py and the top level function that checks for the validity of the file (QandA.txt) is called isValid() (and takes no parameters, since the file name is already known).</p> <p>Write a Python program that will perform the</p>	15	CO4	1,2,3,4,5	3 & 4

	<p>following operations:</p> <ol style="list-style-type: none"> (1) import the solution code from (A) above and check if the QandA.txt file is valid. (2) If the file is invalid, then handle the exception raised by printing to the user "The QandA.txt file is invalid" and exit. (3) Otherwise, if the file is valid, then extract ONLY the questions from this file and store them in another file called Questions.txt, and exit. (4) Questions.txt file should have the following format: <ul style="list-style-type: none"> • Each line should be either a question line or a blank line. • Each question line should be followed by a blank line; even the last question. • A blank line is an empty line containing only a newline character. • A question line should start with 'Q:n' (without the quotes) where n is a positive integer representing the question number. • The question should follow the 'Q:n' on the same line. • The question numbers should be in ascending order, and in the same order as in the QandA.txt file. 			
7. A i)	Write down the differences between lists and tuples?	5	CO3	1,2,3,4,5
ii)	What does [::-1] do?	2	CO3	1,2,3,4,5
iii)	What are Dict and List comprehensions?	5	CO3	1,2,3,4,5
iv)	Write a Python program to check whether a given string is a palindrome or not, without using an iterative method?	3	CO3	1,2,3,4,5
OR 7. B i)	What are negative indexes and why are they used?	3	CO3	1,2,3,4,5
ii)	What is the difference between append() and extend() methods?	4	CO3	1,2,3,4,5
iii)	How to convert a list to tuple? Explain.	3	CO3	1,2,3,4,5
iv)	Given a list, a dictionary, and a key K. Print the value of K from the dictionary if the key is present in both list and dictionary. input: LL=[“Gfg”, “is”, “Good”, “for”] DD={“Gfg”:5, “Best”:6} K=”Gfg”	5	CO3	1,2,3,4,5