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B. Tech-4th (CSC/IT)

Programming in Python

Full Marks : 50

Time : $2\frac{1}{2}$ hours

Answer **all** questions

The figures in the right-hand margin indicate marks

Symbols carry usual meaning

1. Answer *all* questions : 2×5

   (*a*) State any five Python keywords and its use with an example.

   (*b*) What is an array in Python ? Explain with an example.

   (*c*) Define function in Python. How it is different from Lambda function ?

(*Turn Over*)

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(*d*) Explain classes and objects in Python with a suitable example.

(*e*) What are regular expressions? Write a regular expression for validation an input must have one integer and @ special character.

2. (*a*) Differentiate between identifiers and literals in Python with examples. Defines a function named calculate_square() that takes a number as an agrument and returns its square. 4

(*b*) Write a Python program to read a number and print reverse of the number without using inbuild function. 4

Or

(*a*) Explain Python indentation and its role

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in structuring code. Defines a function find_max(numbers) that takes a list of numbers and returns the largest number. 4

(*b*) Compare break, continue and pass statements in Python with examples. Write a Python program that prints numbers from 1 to 20. However, if a number is divisible by 3, skip that number using continue, if a number is greater than 15, stop the loop using break. Use pass inside the loop for numbers divisible by 5 (without effecting the flow). 4

3. (*a*) What are built-in modules in Python ? Explain with examples. 4

(*b*) Describe the various methods available for adding elements to a list in Python. Write a program to generate number in given start and end of a range. Add numbers into the list if the generated number is divisible by 2 and 3. 4

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Or

(*a*) What are Python packages ? How are they different from modules ? 4

(*b*) What is list slicing in Python ? Explain with an example. Takes a list of first N natural numbers ([1, 2, 3, ..., N]). Uses slicing to

(*i*) Extract the first 5 numbers.

(*ii*) Extract the last 3 numbers.

(*iii*) Extract every alternate number.

(*iv*) Print the list in reverse order using slicing. 4

4. (*a*) How do sets differ from lists and tuples in Python ? Explain with examples of set methods. 4

(*b*) How do iterators work in dictionaries explain with an example ? Write a program to ask user to create dictionary of personal

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information and display information using iterator with in a user defined function. 4

Or

(*a*) Explain recursion in Python with an example of a recursive function. Write a program using recursion to find factorial of a number. 4

(*b*) What are dictionary in Python ? Write a Python program to creates a dictionary with student details as name, age, course. Adds a new key 'Batch' with the value 2025. Updates the 'age' of the student to 21. Removes the 'course' key using dictionary method. Displays all keys and values using the items() method. 4

5. (*a*) Write a program to create Car class. Write class method to count numbers of car object created and instance method to add and modify car information in Python. 4

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(*b*) What is constructor in Python ? Explain its role with an example. 4

Or

(*a*) What is inheritance in Python ? Explain different types of inheritance with examples. 4

(*b*) Explain the use of the try-finally block in exception handling with an example. Write a program to handle Division by Zero and Invalid Input. 4

6. (*a*) What is an escape sequence in Python ? Provide examples of commonly used escape sequences. 4

(*b*) What is the string module in Python ? Write a program to takes a sentence as input from the user. Counts and prints the number of uppercase letters, lower-

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case letters, digits and punctuation marks(special character) in the sentence. 4

Or

(*a*) What is file handling in Python ? Explain its importance with an example. 4

(*b*) How can directories be handled using file handling in Python ? Write a Python program that creates a new directory named "TestDirectory" if it does not already exist. Inside this directory, creates a new text file named "sample.txt". Writes the text "Hellow, this is a test file!" into the file. Reads the content of "sample.txt" and displays it on the screen. 4

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