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MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
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Model Question Paper

Modern Computing and Python Programming

Time: 3 Hours (180 Minutes) **Max. Marks: 100**

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

		Module - 1	M	L	C
Q1	a.	With a neat diagram, explain the evolutionary trend toward parallel, distributed and cloud computing, showing how HPC and HTC systems lead to clusters, grids, clouds and the Internet of Things.	08	L2	CO1
	b.	Differentiate between high-performance, load-balancing and high-availability clusters, giving one typical application of each.	06	L2	CO1
	c.	Explain the cloud reference model with respect to IaaS, PaaS and SaaS, giving two vendor examples for each service model.	06	L2	CO1
		OR			
Q2	a.	With neat diagrams, explain the different degrees of parallelism – bit-level, instruction-level, data-level, task-level and job-level parallelism.	08	L2	CO1
	b.	Explain Flynn's classification of hardware architectures for parallel processing (SISD, SIMD, MISD and MIMD) with neat diagrams.	06	L2	CO1
	c.	Differentiate between cloud computing and edge computing with respect to location of processing, response time, computing power, storage, data sent over the network and working without the Internet.	06	L2	CO1
		Module - 2			
Q3	a.	Explain any 8 features of Python.	08	L2	CO2
	b.	Explain variables, identifiers and keywords in Python. Explain the rules for naming identifiers and classify the following as valid or invalid: `total_marks`, `2ndSem`, `_count`, `for`, `usn-no`, `Sum1`.	06	L2	CO2
	c.	Write a Python program that accepts two numbers from the user and performs addition, multiplication, division, floor division, modulus and exponentiation, displaying each result with a suitable message.	06	L3	CO4
		OR			
Q4	a.	Explain the different types of operators in Python – arithmetic, relational, logical, assignment and bitwise – with examples. Explain operator precedence and associativity.	08	L2	CO2
	b.	Explain the basic data types in Python – `int`, `float`, `complex`, `bool` and `str` – with examples. Explain the use of the `type()` function.	06	L2	CO2
	c.	Differentiate implicit and explicit type conversion with examples. Write a Python program to read the radius of a circle, calculate and display its area and circumference, and convert the area into an integer.	06	L3	CO4
		Module - 3			
Q5	a.	Explain string indexing and slicing in Python with suitable examples. Explain string formatting using f-strings and the `format()` method.	08	L2	CO2
	b.	Differentiate between `break`, `continue` and `pass` statements with suitable examples.	06	L2	CO2
	c.	Write a Python program to find the largest of three numbers using the `if-elif-else` statement.	06	L3	CO4
		OR			
Q6	a.	Explain the types of function arguments in Python – required, keyword, default and variable-length arguments – with an example for each.	08	L2	CO2

	b.	Explain the scope of global and local variables with an example. Explain the use of the `global` keyword.	06	L2	CO2
	c.	Explain lambda functions. Write a lambda function to find the square of a number. Create a module `mymath.py` containing functions for addition and subtraction, and show how it is imported and used in another program.	06	L3	CO4
Module - 4					
Q7	a.	Differentiate mutable and immutable objects in Python. Explain the common list operations `append()`, `insert()`, `remove()`, `pop()`, `sort()` and `reverse()` with examples.	08	L2	CO5
	b.	Explain files in Python and the different file opening modes (`r`, `w`, `a`, `r+`, `w+`, `a+`) with the `open()` syntax.	06	L2	CO5
	c.	Write a Python program to create a dictionary with student USN as the key and student name as the value, and perform the following: add a new student, update an existing student's name, delete a student record and display all keys and values.	06	L3	CO5
OR					
Q8	a.	Explain the `read()`, `readline()`, `readlines()`, `write()` and `close()` methods with examples. Explain how data is appended to an existing file.	08	L2	CO5
	b.	Explain tuples in Python. Differentiate between a list and a tuple. Explain `count()`, `index()`, `max()` and `min()` on a tuple with examples.	06	L2	CO5
	c.	Write a Python program to create two sets of integers entered by the user and display their union, intersection, difference and symmetric difference.	06	L3	CO5
Module - 5					
Q9	a.	Explain Artificial Intelligence and its four approaches – acting humanly (the Turing test), thinking humanly, thinking rationally and acting rationally.	08	L2	CO3
	b.	Explain how machines learn, with the basic steps of the learning process. Explain a well-posed learning problem with a suitable example.	06	L2	CO3
	c.	Explain supervised, unsupervised and reinforcement learning with one real-world example of each.	06	L2	CO3
OR					
Q10	a.	With neat diagrams, explain the structure of simple reflex agents, model-based reflex agents, goal-based agents and utility-based agents.	08	L2	CO3
	b.	Explain the concept of a feature in machine learning. Explain data pre-processing with respect to dimensionality reduction and feature subset selection.	06	L2	CO3
	c.	Explain how a model is selected in machine learning. Differentiate predictive and descriptive models with examples.	06	L2	CO3

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