SRMINSTITUTE OF SCIENCE AND TECHNOLOGY

Ramapuram Campus, BharathiSalai, Ramapuram, Chennai - 600089

**FACULTY OF ENGINEERING AND TECHNOLOGY**

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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**QUESTIONBANK**

**DEGREE / BRANCH: B.Tech/CSE with Specializations AIML, BDA,CS and IOT**

**IV SEMESTER**

**SUB CODE – SUBJECT NAME: 18CSC207J/ADVANCED PROGRAMMING**

**PRACTICE**

**Regulation– 2018**

**AcademicYear: 2021-22**

# SRMINSTITUTE OF SCIENCE AND TECHNOLOGY

**Ramapuram Campus, BharathiSalai, Ramapuram, Chennai-600089**

**DEPARTMENTOFCOMPUTERSCIENCEANDENGINEERING**

**QUESTIONBANK**

**SUBJECT : 18CSC207J -ADVANCED PROGRAMMING PRACTICE**

**SEM/YEAR:IV/II**

**Course Outcomes**

***CO1:***Create Programs using structured, procedural and object oriented programming paradigms

***CO2:***Create Programs using event driven, declarative and imperative programming paradigms

***CO3:***Create Programs using parallel, concurrent and functional programming paradigms

***CO4:***Create Programs using logic, dependent type and network programming paradigms

***CO5:***Create Programs using symbolic, automata based and graphical user interface programming paradigms

***CO6:***Create Programs using different programming paradigms using python language

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| **UNITI** | | | |
| Structured Programming Paradigm- Programming Language Theory- Bohm-Jacopini structured program theorem- Sequence, selection, decision, iteration, recursion- Other languages: C, C++, Java, C#, Ruby - Demo: Structured Programing in Python- Procedural Programming Paradigm- Routines, Subroutines, functions- Using Functions in Python- logical view, control flow of procedural programming in various aspects- Other languages: Bliss, ChucK, Matlab- Demo: creating routines and subroutines using functions in Python- Object Oriented Programming Paradigm- Class, Objects, Instances, Methods- Encapsulation, Data Abstraction- Polymorphism, Inheritance- Constructor, Destructor- Example Languages: BETA, Cecil, Lava Demo: OOP in Python | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | In Python which parameter passing mechanism is used with function call.   1. Pass by value 2. Pass by Reference 3. Both Pass by value and Pass by reference 4. None | CO1 | L1 |
| **2** | Which one is correct about variable names in Python.   1. All variable names must begin with an underscore. 2. Unlimited length 3. The variable name length is a maximum of 2. 4. All of the above | CO1 | L1 |
| **3** | Which of the following is not the type of function argument?   1. Positional argument 2. Keyword argument 3. Initial argument 4. Default argument | CO1 | L1 |
| **4** | What will be the output of the following Python code?  **x = 50**  **def func(x):**  **print(‘x is’, x)**  **x = 2**  **print(‘Changed local x to’, x)**  **func(x)**  **print(‘x is now’, x)**   1. x is 50   Changed local x to 2  x is now 50   1. x is 50   Changed local x to 2  x is now 2   1. x is 50   Changed local x to 2  x is now 100   1. None | CO1 | L2 |
| **5** | What will be the output of the following Python code?  **values = [[3, 4, 5, 1], [33, 6, 1, 2]]**  **v = values[0][0]**  **for row in range(0, len(values)):**  **for column in range(0, len(values[row])):**  **if v < values[row][column]:**  **v = values[row][column]**  **print(v)**   1. 3 2. 5 3. 6 4. 33 | CO1 | L3 |
| **6** | What will be the output of the following piece of code. [CLO-1,L3]  **def greet(name,msg=’Good Day’):**  **print("Hello",name + ', ' + msg)**  **greet("AAA")**  **greet(“BBB”,”Good Morning”)**   1. Hello AAA Good Morning, Hello BBB Good Morning 2. Hello AAA Good Morning, Hello BBB Good Day 3. Hello AAA Good Day, Hello BBB Good Day 4. Hello AAA Good Day, Hello BBB Good Morning | CO1 | L2 |
| **7** | What is the correct syntax to create a class named Student that will inherit properties and methods from a class named Person in Python?  a) class Student from Person:  b) class Student(Person):  c) Student(Person):  d) class Student : Person | CO1 | L1 |
| **8** | What value will be printed by the print statement given in the following code?  **odd=lambda x: bool(x%2)**  **numbers=[n for n in range(10)]**  **print(numbers)**  **n=list()**  **for i in numbers:**  **if odd(i):**  **continue**  **else:**  **break**   1. [0, 2, 4, 6, 8, 10] 2. [0, 1, 2, 3, 4, 5, 6, 7, 8, 9] 3. [1, 3, 5, 7, 9] 4. Error | CO1 | L3 |
| **9** | The number of arguments taken by lambda function   1. 1 2. 2 3. Any number 4. None | CO1 | L1 |
| **10** | Which of the following is true regarding Generic/meta programming?   1. generates semantic associations 2. Programs about programs 3. generates higher-order programs 4. is used for assembly level manipulations | CO1 | L1 |
| **11** | If a is a dictionary with some key-value pairs, what does a.pop(‘key’) do?   1. Removes an arbitrary element 2. Removes all the key-value pairs 3. Removes the key-value pair for the key given as an argument 4. Invalid method for dictionary | CO1 | L2 |
| **12** | According to Bohm-Jacopini, a function is possible by combining subprograms in which three manners?   1. Jump, Sequence and Loop 2. Sequence, Function Calls and Subroutines 3. Sequence, Iteration and Selection 4. Iteration, Macros and Branching | CO1 | L1 |
| **13** | What are the values printed by the two print statements given below?  **a=10**  **b=20**  **def change():**  **global b**  **a=45**  **b=56**  **change()**  **print(a)**  **print(b)**   1. 10 56 2. 45 56 3. 10 20 4. Syntax Error | CO1 | L3 |
| **14** | Which of the following is the use of id() function in Python?   1. Every object doesn’t have a unique id 2. id returns the identity of the object 3. All of the mentioned 4. None of the mentioned | CO1 | L1 |
| **15** | What will be the value printed by the last print statement in the following Python code?  **d={“id”:101, “name”:”AAA”, “dept”:”QA”}**  **print(d)**  **print(“Emp ID=”,d[‘id’])**  **print(“Emp Name=”,d[‘name’])**  **print(“EmpDept=”,d[‘dept’])**  **d[‘dept’]=”RA”**  **print(d)**  **d.pop(‘dept’)**  **print(d[‘dept’])**   1. QA 2. RA 3. KeyError: ‘dept’ 4. None | CO1 | L3 |
| **16** | Which of the following is correct way to add all classes, methods or other datatypes(list, tuple, dictionary) etc.. of a module in Python?   1. import \* from module\_name 2. from module\_name import \* 3. from module\_name import all 4. import module\_name as m | CO1 | L2 |
| **17** | ---------------- refers to the spaces at the beginning of a code line which is considered as the special important feature of Python.   1. Indentation 2. Input 3. Inherit 4. Identification | CO1 | L1 |
| **18** | \_\_\_\_\_\_\_\_\_ is a graphical representation of structured programming using Top down analysis.   1. Programming Paradigm 2. Structogram 3. Flowchart 4. Proess block | CO1 | L1 |
| **19** | Which of the following statements is incorrect about the following code?  **class People():**  **def \_\_init\_\_(self, name):**  **self.name = name**  **def namePrint(self):**  **print(self.name)**  **person1 = People("John")**  **person2 = People("Sai")**  **person1.namePrint()**   1. person1 and person2 are two different instances of the People class 2. The \_\_init\_\_ method is used to set initial values for attributes 3. 'self' is not needed in def namePrint(self): 4. person2 has a different value for 'name' than person1 | CO1 | L3 |
| **20** | \_\_\_\_\_\_\_\_\_ is not a keyword, but by convention it is used to refer to the current instance (object) of a class.   1. class 2. def 3. self 4. init | CO1 | L2 |
| **21** | Which of the following is the correct way to define an initializer method?   1. def \_\_init\_\_(title, author): 2. def \_\_init\_\_(self, title, author): 3. def \_\_init\_\_(): 4. \_\_init\_\_(self, title, author): | CO1 | L2 |
| **22** | How the constructors and destructors can be differentiated?   1. Destructor have a return type but constructor doesn’t 2. Destructors can’t be defined by the programmer, but constructors can be defined 3. Destructors are preceded with a tilde symbol, and constructor doesn’t 4. Destructors are same as constructors in syntax | CO1 | L2 |
| **23** | What is the output of the function complex()?   1. 0j 2. 0+0j 3. 0 4. Error | CO1 | L2 |
| **24** | What does ~~~5 evaluate to?   1. +5 2. -11 3. +11 4. -5 | CO1 | L2 |
| **25** | Which specifier should be used for member functions of a class to avoid inheritance?   1. Private 2. Default 3. Protected 4. Public | CO1 | L2 |
| **PART B (4 Marks)** | | | |
| **1** | What is Structured programming? How does it minimize the complexity? | CO1 | L1 |
| **2** | Write a python program with an add() function to return the sum of  two integers. | CO1 | L3 |
| **3** | List on Python Variables and its types. | CO1 | L1 |
| **4** | Compare structured programming and Procedural programming. | CO1 | L2 |
| **5** | Write a program to implement recursion. | CO1 | L3 |
| **6** | What is Data abstraction and explain its types. | CO1 | L1 |
| **7** | Define Inheritance. | CO1 | L1 |
| **8** | Write a program to create a list and print the values. | CO1 | L3 |
| **PART C (12 Marks)** | | | |
| **1** | There are 50 computers available in computer programming lab where each computers are used six hours per day. Write a Python program using classes and objects that contain getDetail() for getting input from user,calculatesecondperDay() for calculating the usage of each computer in seconds per day, calculateminutesperWeek() for calculating the usage of each computer in minutes per week ,calculatehourperMonth() for calculating usage of each computer in hour per month and calculatedayperYear() for calculating usage of each computer in day per yearList all the Components of structured programming language | CO1 | L3 |
| **2** | Discuss the features of Procedural programming. | CO1 | L2 |
| **3** | Define Function and recursion and explain them in detail | CO1 | L2 |
| **4** | List out the Features of object oriented programming | CO1 | L2 |
| **5** | Write a python program to get square and cube of a number using  Inheritance concept. | CO1 | L3 |

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| **UNITII** | | | |
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| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | In event driven programming, flow of the program is determined by \_\_\_\_  a. Sensors only  b. Exceptions and Errors only  c. **User actions and sensors**  d. Peripherals only | CO2 | BT2 |
| **2** | Which of the following languages does not support Event-driven programming paradigm?  a. ALGOL  b. Python  c. Javascript  d.  **Prolog** | CO2 | BT2 |
| **3** | Which of the following is not an Event?  a. User actions  b. System messages  c. Interrupts  d. **Compiler Errors** | CO2 | BT2 |
| **4** | What does the scheduler do when an event occurs?  a. Throw an Exception  b. **Call the appropriate event handler**  c. Terminate the program  d. Wait for the event to be handled | CO2 | BT1 |
| **5** | Which of the following is not true about an event handler?  a. Block of code that deals with an event  b. Triggered by an event  c. **One event can have only one handler**  d. Executes only when it is called | CO2 | BT3 |
| **6** | Swing uses \_\_\_\_\_\_\_\_ to represent an event  a. Class  b. Functions  c. **Object**  d. Subroutine | CO2 | BT1 |
| **7** | Event handler is also known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  a. Event Procedure  **b. Event Listener**  c. Event Dispatcher  d. Event Scheduler | CO2 | BT2 |
| **8** | In Tkinter , the main window is known as  a. Master  b. **Root**  c. Primary  d. JWindow | CO2 | BT1 |
| **9** | What is not true about Declarative programming?  a. focus is on what needs to be done rather how it should be done  b. style of building programs that expresses logic of computation without talking about its control flow  c. declare the result we want rather how it has be produced  d. **builds programs using implementation logic** | CO2 | BT3 |
| **10** | Identify examples of declarative statements?  a. **Literals, variables, constants**  b. Data types, functions, Macros  c. Variables, functions, constants  d. Constants, data types, methods | CO2 | BT2 |
| **11** | Which type of the declarative statements does the following code represent?  class MyClass:  x = 5  y=’John’  p1 = MyClass()  print(p1.x)  a. **Homogenous Declarative**  b. Hybrid declarative  c. Heterogeneous declarative  d. Multiple Declarative | CO2 | BT3 |
| **12** | Object attributes are defined within the \_\_\_\_\_\_\_\_\_ constructor  a. **\_init\_**  b. \_initialize\_  c. \_attr\_  d. \_obj\_ | CO2 | BT1 |
| **13** | What does a descriptor protocol hold?  a. methods that overload attribute access of descriptors  b. **methods that override attribute access of descriptors**  c. methods that define the attribute and variable access of descriptors  d. methods that declare the attributes of descriptors | CO2 | BT2 |
| **14** | How we import a tkinter in python program ?  a.import tkinter  b.import tkinter as t  c.from tkinter import \*  **d.All of the above** | CO2 | BT2 |
| **15** | Which function is used to delete any widget from the screen ?  a.stop()  b.delete()  **c.destroy()**  d.break() | CO2 | BT2 |
| **16** | What is false regarding imperative languages?  a. work by modifying program state  b. code executes too slowly for optimal results on complex data science applications  c. **focus on *what* and not *how***  d. executes step by step commands | CO2 | BT3 |
| **17** | Which among the following is not a primitive data structure?  a. Pointers  b. **Files**  c. Boolean  d. Integer | CO2 | BT2 |
| **18** | Identify the methods of Iterator class in Python?  a. **\_\_iter\_\_ and \_\_next\_\_**  b. \_\_repeat \_\_ and \_\_ iter\_\_  c. \_\_iter\_\_ and \_\_move\_\_  d. \_\_prev\_\_ and \_\_next\_\_ | CO2 | BT3 |
| **19** | Which of the following is the advantage of declarative languages over imperative languages?    (a) Can use abstract data type  (b**) Easy to verify the properties of the program**  (c) Is more efficient  (d) Can be implemented by an interpreter or compiler; | CO2 | BT2 |
| **20** | Which of the following language is a declarative language?  a. Algol  b. Java  c. C++  d. **Prolog** | CO2 | BT1 |
| **21** | Which is the right syntax to join two lists in Python?  a. Listoflist = {listA},{listB}  b. listoflist = [listA, listB]  c. listoflist = [listA+listB]  d. listoflist = [listA]+[listB] | CO2 | BT3 |
| **22** | States in Python are represented as  a. Class  b. Variables  c. **Objects**  d. Static variables | CO2 | BT1 |
| **23** | Which of the following will modify a state?  a. pass the name(s) of the state(s) to the Machine initializer  b. directly initialize each new State object  c. **modify() method that belongs to the State object**  d. pass a dictionary with initialization arguments | CO2 | BT3 |
| **24** | Which transition will never leave the state?  a. Internal transition  b. **Reflexive transition**  c. Iterative transition  d. Casted Transition | CO2 | BT1 |
| **25** | Which of the following is not a part of an INFO-level logging in Python?  a. state changes  b. transition triggers  c. **callbacks**  d. conditional checks | CO2 | BT1 |
| **PART B (4 Marks)** | | | |
| **1** | How is KeyListener used to handle keypress event? | CO2 | BT2 |
| **2** | List and define the three participants in an event | CO2 | BT1 |
| **3** | List the declarative statements in declarative programming with examples. | CO2 | BT1 |
| **4** | Write a Python program that creates a Timer that will explode in 2 seconds using TURTLE module. | CO2 | BT2 |
| **5** | Illustrate the invoking of a descriptor using \_ \_getattribute()\_ \_ method. | CO2 | BT3 |
| **6** | Bring out the differences between Lists and Tuples in Python using examples. | CO2 | BT1 |
| **7** | Using Turtle, Write a Python program to demonstrate Keypress Events. the turtle on the screen must move according to the arrow keys (Up,Left,Right and Back) pressed. | CO2 | BT3 |
| **8** | Compare and contrast imperative programming and declarative programming. | CO2 | BT2 |
| **PART C (12 Marks)** | | | |
| **1** | Discuss about an Event object and steps to handle an event | CO2 | BT1 |
| **2** | Design the Students information system with student details, qualification details and mark details and add insert, delete and update button. Write an event handler to send the marks to their parents, immediately after the mark has been updated. | CO2 | BT3 |
| **3** | Elaborate on the features of declarative programming and list the set of declarative statements. | CO2 | BT2 |
| **4** | Write a Python program to create three states Solid, Liquid and Gas. Create transitions Melt, Evaporate, Sublimate and Ionize with an exit callback printing the transition name. | CO2 | BT3 |
| **5** | Compare imperative programming with declarative programming. | CO2 | BT1 |

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| **UNITIII** | | | |
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| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | Parallelism representation is critical to the success of ----------------------  **a)High-performance computing**.  b)Low-performance computing  c)Scaling  d)Vectorization | CO4 | BT1 |
| **2** | Parallel programming through a combination of -----------and ------------  **a.Patterns, examples**  b.Algorithms , flowcharts  c.Models , methods  d.Classes ,objects | CO4 | BT1 |
| **3** | What is multithreaded programming?  a) It’s a process in which two different processes run simultaneously  b) **It’s a process in which two or more parts of same process run simultaneously**  c) It’s a process in which many different process are able to access same information  d) It’s a process in which a single process can access information from many sources | C04 | BT1 |
| **4** | Which of these are types of multitasking?  a) Process based  b) Thread based  c) **Process and Thread based**  d) Task Based | CO4 | BT2 |
| **5** | What will happen if two threads of the same priority are called to be processed simultaneously?  a) Anyone will be executed first lexographically  b) Both of them will be executed simultaneously  c) None of them will be executed  d) **It is dependent on the operating system** | CO4 | BT2 |
| **6** | Which of these statements is incorrect?  a) By multithreading CPU idle time is minimized, and we can take maximum use of it  b) By multitasking CPU idle time is minimized, and we can take maximum use of it  c) Two thread in Java can have the same priority  d) **A thread can exist only in two states, running and blocked** | CO4 | BT2 |
| **7** | Identify the technique that allows more than one program to be ready for execution and provides the ability to switch from one process to another.  a) multitasking  b) multiprocessing  c) multitasking  d) **multiprogramming** | CO4 | L2 |
| **8** | The technique that increases the system’s productivity.  a) multiprogramming  b) multitasking  c) multiprocessing  d) single-programming | CO4 | L1 |
| **9** | \_\_\_\_\_\_\_\_\_\_\_\_\_is a property in which more than one operation can be run simultaneously but it doesn’t mean it will be.  a. Concurrency  b.Semaphore  c.Mutual exclusion  d.parallel process | CO4 | L1 |
| **10** | \_\_\_\_\_\_\_\_\_\_\_\_ is a light-weight cooperatively-scheduled execution unit.  a. [gevent.Greenlet](http://www.gevent.org/api/gevent.greenlet.html#gevent.Greenlet)  b. [gevent.spawn()](http://www.gevent.org/api/gevent.html#gevent.spawn)  c.[gevent.spawn\_later()](http://www.gevent.org/api/gevent.html#gevent.spawn_later)  d.[gevent.spawn\_raw()](http://www.gevent.org/api/gevent.html#gevent.spawn_raw) | CO4 | L3 |
| **11** | Which keyword is used to define methods in Python?  (a) function  (b) def  (c) method  (d) All of these | CO4 | L2 |
| **12** | \_\_\_\_\_\_\_\_is a builtin python module where all possible types are defined  a) overload  b)typing  c)function  d)literal | CO4 | L2 |
| **13** | \_\_\_\_\_\_\_\_\_\_\_type represents a specific value of the specific type  a) overload  b) typing  c) literal  d) None of the above | CO4 | L1 |
| **14** | \_\_\_\_\_\_\_\_\_\_ is required to define multiple function declarations with different input types and results.  a) overload  b) typing  c) literal  d) None of the above | CO4 | L1 |
| **15** | Which among the following is not the blocking objects for task Synchronization.  a) Events  b) Mutexes and semaphores  c) waitable timers  d) stack |  |  |
| **16** | Which among the following is not the Synchronization primitives in python.  a) Lock  b) M-Lock  c) Semaphores  d) R-lock |  |  |
| **17** | Which is/are the Method for Programming Parallel:  a) Message Passing  b) Shared Memory  c) Data Parallel  d) all the above |  |  |
| **18** | Which among the following is not the Parallel programming model.  a) Phase Parallel  b) Divide and Conquer  c) Pipe line  d) Backtracking |  |  |
| **19** | Multi Threading can be achieved by importing which library in python  a) threading  b) threaded  c) thead  d) Multi thread |  |  |
| **20** | Process and Pool class models follows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ policy for scheduling and execution.  a) LIFO-last in first out  b) FIFO-first in first out  c) LRU-least recently used  d) LFU- least frequently used |  |  |
| **21** | Which among the following is not Pure Function.  a) strlen()  b) pow()  c) sqrt()  d) printf() |  |  |
| **22** | Which among the following is not Impure Function.  a) strcpy()  b) printf()  c) rand()  d) time() |  |  |
| **23** | Which among the following is not an mutable data type?  a) List  b) bool  c) dictionary  d) set |  |  |
| **24** | Which among the following is not an immutable data type?  a) List  b) bool  c) string  d) tuple |  |  |
| **25** | Which of the following is/are function programming tool:  a) filter(function, sequence)  b) map(function, sequence)  c) reduce(function, sequence)  d) all the above |  |  |
| **PART B (4 Marks)** | | | |
| **1** | Differentiate parallel programming with functional programming | CO4 | L2 |
| **2** | Explain about Multithreading | CO4 | L1 |
| **3** | Explain about Multiprocessing. | CO4 | L1 |
| **4** | Demonstrate Multiprocessing module in Python | CO4 | L3 |
| **5** | Describe about Process class. | CO4 | L2 |
| **6** | Design a Pool class in Python | CO4 | L3 |
| **7** | State Concurrent programming paradigm. | CO4 | L1 |
| **8** | Compare multiprocessing and multitasking. | CO4 | L2 |
| **PART C (12 Marks)** | | | |
| **1** | Write a python program to implement the producer consumer problem. | CO4 | L3 |
| **2** | Implement the concept “Pool class” by importing a package pool | CO4 | L3 |
| **3** | Write a python program to implement the dining philosopher problem. | CO4 | L3 |
| **4** | Explain the differences between multithreading and multiprocessing with an example? | CO4 | L1 |
| **5** | Compare Concurrent programming paradigm and functional programming paradigm with example program. | CO4 | L2 |

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| **UNIT IV** | | | |
| Functional Units and Basic Operational Concepts – Language of a Computer Operations and Operands-Instruction Representation-Logical Operations and decision making- MIPS Addressing-Bus Structure-Bus  Operation | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | Parallelism representation is critical to the success of ---------------------- a)High-performance computing b)Low-performance computing c)Scaling  d)Vectorization | CLO4 | BT1 |
| **2** | Parallel programming through a combination of -----------and ------------(,L1)  a.Patterns, examples  b.Algorithms , flowcharts  c.Models , methods  d.Classes ,objects | CLO4 | BT1 |
| **3** | What is multithreaded programming? (CLO-4,L1)  a) It’s a process in which two different processes run simultaneously  b) It’s a process in which two or more parts of same process run simultaneously  c) It’s a process in which many different process are able to access same information  d) It’s a process in which a single process can access information from many sources | CLO-4 | BT1 |
| **4** | Which of these are types of multitasking? (CLO-4,L2)  a) Process based  b) Thread based  **c) Process and Thread based**  d) Task based | CLO-4 | BT2 |
| **5** | What will happen if two thread of the same priority are called to be processed simultaneously? (CLO-4,L2)  a) Anyone will be executed first lexographically  b) Both of them will be executed simultaneously  c) None of them will be executed  **d) It is dependent on the operating system** | CLO-4 | BT2 |
| **6** | Which of these statements is incorrect?  a) By multithreading CPU idle time is minimized, and we can take maximum use of it  b) By multitasking CPU idle time is minimized, and we can take maximum use of it  c) Two thread in Java can have the same priority  d) A thread can exist only in two states, running and blocked | CLO-4 | BT2 |
| **7** | Identify the technique that allows more than one program to be ready for execution and provides the ability to switch from one process to another.  a) multitasking  b) multiprocessing  c) multitasking  d) multiprogramming | CLO-4 | BT2 |
| **8** | The technique that increases the system’s productivity.  a) multiprogramming  b) multitasking  c) multiprocessing  d) single-programming | CLO-4 | BT1 |
| **9** | \_\_\_\_\_\_\_\_\_\_\_\_\_is a property which more than one operation can be run simultaneously but it doesn’t mean it will be. (  a. Concurrency  b.Semaphore  c.Mutual exclusion  d.parallel process | CLO-4 | BT1 |
| **10** | \_\_\_\_\_\_\_\_\_\_\_\_ is a light-weight cooperatively-scheduled execution unit.  a. [gevent.Greenlet](http://www.gevent.org/api/gevent.greenlet.html#gevent.Greenlet)  b. [gevent.spawn()](http://www.gevent.org/api/gevent.html#gevent.spawn)  c.[gevent.spawn\_later()](http://www.gevent.org/api/gevent.html#gevent.spawn_later)  d.[gevent.spawn\_raw()](http://www.gevent.org/api/gevent.html#gevent.spawn_raw) | CLO-4 | BT3 |
| **11** | Which keyword is used to define methods in Python?  (a) function  (b) def  (c) method  (d) class | CLO-4 | BT2 |
| **12** | Which one of the following options is CORRECT given three positive integers x, y and z, and a predicate?  P(x) = ¬(x=1)∧∀y(∃z(x=y\*z)⇒(y=x)∨(y=1))  **a) P(x) being true means that x is a prime number**  b) P(x) being true means that x is a number other than 1  c) P(x) is always true irrespective of the value of x  d) P(x) being true means that x has exactly two factors other than 1 and x | CLO-4 | BT3 |
| **13** | Suppose the predicate F(x, y, t) is used to represent the statement that person x can fool person y at time t. which one of the statements below expresses best the meaning of the formula ∀x∃y∃t(¬F(x, y, t))?  (a) Everyone can fool some person at some time  (b) No one can fool everyone all the time  (c) Everyone cannot fool some person all the time  (d) No one can fool some person at some time | CLO-4 | BT3 |
| **14** | Which one of the following is the most appropriate logical formula to represent the statement? “Gold and silver ornaments are precious”.  The following notations are used:  G(x): x is a gold ornament  S(x): x is a silver ornament  P(x): x is precious  (a) ∀x(P(x)→(G(x)∧S(x)))  (b) ∀x((G(x)∧S(x))→P(x))  (c) ∃x((G(x)∧S(x))→P(x)  (d) ∀x((G(x)∨S(x))→P(x)) | CLO-4 | BT3 |
| **15** | Which one of the first order predicate calculus statements given below correctly express the following English statement?  Tigers and lions attack if they are hungry or threatened. | CLO-4 | BT3 |
| **16** | What is the correct translation of the following statement into mathematical logic? “Some real numbers are rational” | CLO-4 | BT3 |
| **17** | What is the first order predicate calculus statement equivalent to the following? Every teacher is liked by some student  (A) ∀(x) [teacher (x) → ∃ (y) [student (y) → likes (y, x)]]  (B) ∀ (x) [teacher (x) → ∃ (y) [student (y) ^ likes (y, x)]]  (C) ∃ (y) ∀ (x) [teacher (x) → [student (y) ^ likes (y, x)]]  (D) ∀ (x) [teacher (x) ^ ∃ (y) [student (y) → likes (y, x)]] | CLO-4 | BT3 |
| **18** | Which of the above two are equivalent?  (A) I and III  (B) I and IV  (C) II and III  (D) II and IV | CLO-4 | BT3 |
| **19** | \_\_\_\_\_\_\_\_is a builtin python module where all possible types are defined. .(  (a) overload  b)typing  c)function  d)literal  Ans: b | CLO-4 | BT2 |
| **20** | \_\_\_\_\_\_\_\_\_\_\_type represents a specific value of the specific type.  a) overload  b) typing  c) literal  d) override  Ans: c | CLO-4 | BT1 |
| **21** | \_\_\_\_\_\_\_\_\_\_ is required to define multiple function declarations with different input types and results.  a) overload  b) typing  c) literal  d) multiple | CLO-4 | BT1 |
| **22** | Which among the following is not Pure Function.  a) strlen()  b) pow()  c) sqrt()  d) printf() | CLO-4 | BT1 |
| **23** | Which among the following is not Impure Function.  a) strcpy()  b) printf()  c) rand()  d) time() | CLO-4 | BT1 |
| **24** | Which among the following is not an mutable data type?  a) List  b) bool  c) dictionary  d) set | CLO-4 | BT2 |
| **25** | Which among the following is not an immutable data type?  a) List  b) bool  c) string  d) tuple | CLO-4 | BT2 |
| **PART B (4 Marks)** | | | |
| **1** | State parallel programming paradigm. | CLO-4 | BT1 |
| **2** | Differentiate parallel programming with functional programming. | CLO-4 | BT2 |
| **3** | Explain about Multithreading. | CLO-4 | BT1 |
| **4** | Compare multiprocessing and multitasking. | CLO-4 | BT2 |
| **5** | Relate Serial processing concepts in Python. | CLO-4 | BT3 |
| **6** | Differentiate Serial Processing and Parallel Processing. | CLO-4 | BT3 |
| **7** | Demonstrate Multiprocessing module in Python. | CLO-4 | BT3 |
| **8** | Describe briefly about Process class. | CLO-4 | BT2 |
| **PART C (12 Marks)** | | | |
| **1** | Write a python program to implement producer consumer problems. | CLO-4 | BT3 |
| **2** | Implement the concept “Pool class” by importing a package pool. | CLO-4 | BT3 |
| **3** | Explain the differences between multithreading and multiprocessing with an example? | CLO-4 | BT1 |
| **4** | Write a python program to check every **key:value** pair in a dictionary and check if they match the **name:email** format using typing module. | CLO-4 | BT3 |
| **5** | Compare Concurrent programming paradigm and functional programming paradigm with example program. | CLO-4 | BT2 |

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| **UNIT V** | | | |
| Symbolic Programming Paradigm, Symbolic Maths, algebraic manipulations, limits, differentiation, integration, series  SymPy usage for symbolic maths, Equation Solving, Matrices  Other languages: Aurora, LISP, Wolfram, Demo: Symbolic Programming in Python  Automata Based Programming Paradigm, Finite State Machine, deterministic finite automation (dfa).  NFA State transitions using python-automaton, Initial state, destination state, event (transition)  Other languages: Forth, Ragel, SCXML, Demo: Automata Based Programming in Python  GUI Programming Paradigm, Graphical User Interface (GUI)  Tkinter, WxPython, JPython, WxWidgets, PyQT5  Other languages: GTK, java-gnome, Demo: GUI Programming in Python | | | |
| **PART-A (Multiple Choice Questions)** | | | |
| **Q.**  **No** | **Questions** | **Course Outcome** | **Competence**  **BT Level** |
| **1** | Which of the following is false about sympy?  a. Sympy is a python library for symbolic mathematics  b. It requires external libraries for execution  c. It is an alternative to the systems like mathematica or maple  Ans: B | CO5 | BT1 |
| **2** | Limit the Sympy Expression using the syntax  a. limit (var,func,point)  b. limit(func,var,point)  c. limit(func,var)  d. limit(var,point)  Ans: B | CO5 | BT1 |
| **3** | Finite state machines are used for\_\_\_\_  a. Pseudo random test patterns  b. Deterministic test patterns  c. Random test patterns  d. Algorithmic test patterns  Ans:D | CO5 | BT1 |
| **4** | \_\_\_\_\_\_\_ is a class attribute defined by its source state and destination state.  a. LGPL  b. Scipy  c. Transition  d. State  Ans : C | CO5 | BT1 |
| **5** | What kind of abstract machine can recognize strings in a regular set?  a. DFA  b. NFA  c. PDA  d. DFA,NFA  Ans: A | CO5 | BT1 |
| **6** | Identify the latest version of wxPython that supports both Python 2 and Python 3  a. wxPython  b. Phoenix  c. wxJython  d. Sphinx  Ans: A | CO5 | BT1 |
| **7** | In regular expressions, the operator ‘\*’ stands for------  a. Concatenation  b. Addition  c. Selection  d. Iteration  Ans: D | CO5 | BT1 |
| **8** | \_\_\_\_\_\_\_ is used for grouping and organizing the widgets  a. Menu  b. Window  c. Frame  d. ListBox  Ans: C | CO5 | BT1 |
| **9** | [Essential thing to create a window screen using tkinter python?](http://r4r.in/mcqs/mcqs-questions-answers.php?que_id=112&test_id=2)  a. Call tk() function  b. Create a button  c. To define a geometry  d. Create a Window  Ans: A | CO5 | BT1 |
| **10** | Differentiate the Sympy Expression using the syntax  a. diff (var,func)  b. diff(func,var)  c. diff(expr,var)  d. diff(var,point)  Ans: B | CO5 | BT1 |
| **11** | Choose the correct output for the following code?  Import sympy as sym  a= sym.Rational(4,6)  print a  a. 6/4  b. 0.66  c. 4/6  d. 1.5  Ans: C | CO5 | BT2 |
| **12** | Choose the output for the following code?  Limit (sin(x), x,0)  a. 0  b. 1  c. Infinite  d. Error  Ans: B | CO5 | BT2 |
| **13** | evalf() function evaluates a given numerical expression upto a given floating point precision upto \_\_\_\_\_\_ digits.  a. 1  b. 10  c. 100  d. 1000  Ans: C | CO5 | BT2 |
| **14** | Which of the following is the correct output for the below given code?  x,y=sym.symbols(‘x,y’)  A=sym.Matrix([[1,x],[y,1]])  print A  a. Matrix ([[1,x], [y,1]])  b. Matrix ([[x,1],[1,y]])  c. Matrix ([[0,x], [y,0]])  d. Matrix ([[x,0],[0,y]])  Ans: A | CO5 | BT2 |
| **15** | Which of the following is correct among the following expressions?  i.  ii.  iii.  a. i,ii  b. ii,iii  c. i,iii  d. i,ii,iiii  Ans: A | CO5 | BT2 |
| **16** | wxPython API contains wx.Slider class.  a. Yes  b. No  c. Can be yes or no  d. Can not say  Ans: A |  |  |
| **17** | Which of the following statements is correct in jpython code?  class Name:  def \_\_init\_\_(javatpoint):  javajavatpoint = java  name1=Name("ABC")  name2=name1   1. It will throw the error as multiple references to the same object is not possible 2. id(name1) and id(name2) will have same value 3. Both name1 and name2 will have reference to two different objects of class Name 4. id(name1) and id(name2) will have different value   Ans: B | CO5 | BT2 |
| **18** | (a+b)\* is equivalent to-------  a. b\*a\*  b. (a\*b\*)\*  c. a\*b\*  d. (a\*b\*)  Ans: B | CO5 | BT2 |
| **19** | Choose the following correct output  from sympy import sqrt, pprint, mul  x=sqrt(2)  y=sqrt(2)  pprint(mul(x,y,evaluate=false))  print(‘equals to’)  print (x\*y)  a. 4  b. 2  c. Sqrt(2)  d. Error  Ans: B | CO5 | BT2 |
| **20** | How does the grid function put the widget on the screen?  a. According to x,y coordinate  b. According to row and column wise  c. According to left, right  d. According to up, down  Ans: B | CO5 | BT2 |
| **21** | According to the given transitions, which among the following are the epsilon closures of q1 for the given NFA?  Δ (q1, ε) = {q2, q3, q4}  Δ (q4, 1) =q1  Δ (q1, ε) =q1  a. q4  b. q2  c. q1  d. q1, q2, q3, q4  Ans: D | CO5 | BT3 |
| **22** | Choose the right steps for creating the GUI  a. Import the module Tkinter, Add the widgets, Build a GUI application (as a window), Enter the main event's loop for taking action when the user triggered the event  b. Import the module Tkinter, Build a GUI application (as a window), Add the widgets, Enter the main event's loop for taking action when the user triggered the event  c. Add the widgets, Build a GUI application (as a window), Enter the main event's loop for taking action when the user triggered the event  d. Build a GUI application (as a window), Add the widgets, Enter the main event's loop for taking action when the user triggered the event  Ans: B | CO5 | BT3 |
| **23** | Choose the correct output for the following code?  from sympy import \*  mat = Matrix([[1, 2], [2, 1]])  new\_mat = mat.col\_insert(1, Matrix([[3], [4]]))  print(new\_mat)  a. [1,2,3], [2,3,4]  b. [1,3,2],[2,4,3]  c. [1,2,3],[2,4,1]  d. [1,3,2],[2,4,1]  Ans: D | CO5 | BT3 |
| **24** | Choose the correct output for the following code.  from tkinter import \*  m1 = PanedWindow()  m1.pack(fill = BOTH, expand = 1)  left = Entry(m1, bd = 5)  m1.add(left)  m2 = PanedWindow(m1, orient = VERTICAL)  m1.add(m2)  top = Scale( m2, orient = HORIZONTAL)  m2.add(top)  mainloop()  a.  b.  c.  d.  Ans: A | CO5 | BT3 |
| **25** | What is the output of the following Python code for the given statements?  import sympy as sym  x = Symbol('x')  y = Symbol('y')  ans1 = expand((x + y) \*\* 3)  print("expand: ", ans1)  ans2=simplify((x + x \* y) / x)  print("simplify:",ans2)  1. If the expression is sin(x)/cos(x), what will be the output using simplify method  a. Sin (x)  b. Cos (x)  c. Tan (x)  d. Cos -1(x)  Ans: C  2. What is the output of (x+y)\*\*2?   1. x\*\*2+2\*x\*y+y\*\*2 2. x\*\*2-2\*x\*y+y\*\*2 3. x\*\*2+2\*x\*y-y\*\*2 4. x\*\*2-2\*x\*y-y\*\*2   Ans: A | CO5 | BT3 |
| **PART B (4 Marks)** | | | |
| **1** | Write a program to factorize the following expression  x\*\*3 + 3\*x\*\*2\*y + 3\*x\*y\*\*2 + y\*\*3 | CO5 | BT3 |
| **2** | Write a Program to Create the following Layout using Python: | CO5 | BT2 |
| **3** | Let Σ = {0, 1}. Give DFAs for {}, {ε}, Σ\*, and Σ+ | CO5 | BT3 |
| **4** | Find an NFA to recognize the language (*a* + *ba*)\**bb*(*a* + *ab* | CO5 | BT2 |
| **5** | Design and implement a GUI program that consist of “Subject” , ” Faculty” List box and “SUBMIT” button .Subject and faculty for the corresponding subject should be selected by the student and it should be submitted with the help of submit button | CO5 | BT3 |
| **6** | Write the commands to perform the operations on substitutions and expressions | CO5 | BT1 |
| **7** | Write a DFA automata code for L(M)={(*ab)n* | *n* Î N} | CO5 | BT2 |
| **8** | Write a DFA automata code for L(M) ={ w | w has an even number of 1s} | CO5 | BT2 |
| **PART C (12 Marks)** | | | |
| **1** | Consider the following series:  X+(X2/2) + (X3/3) + (X4/4) +……+(Xn/N)  Write a python program that will ask a user to input a number, n, and print this series for that number. In the series, x is a symbol and n are an integer input by the program’s user. The nth term in this series is given as (Xn/N). | CO5 | BT3 |
| **2** | Design a student information system which consists of name, register number, email-id, department, five subject names and marks for each subject and calculate Average marks. Requirements:  (i) Add check button to select subjects and department and add entry buttons for getting name, registration number, email-id from the user.  (ii)Make use of Grid to arrange all the widgets and display Average marks in label box. | CO5 | BT2 |
| **3** | a. Write NFA automata code for the Language that accepts all end with 01  b. Write a automata code for L(M)= *a* + *aa*\**b* + *a*\**b*.  c Write a automata code for Let Σ = {0, 1}.  Given NFAs for {}, {ε}, {(*ab)n* | *n* Î N}, which has regular expression (*ab*)\* | CO5 | BT3 |
| **4** | Design an alarm tool that should allow users to create, edit, and delete alarms. It should also have an interface that lists all the alarms, provided they have not being deleted by the user | CO5 | BT3 |
| **5** | Find an DFA for each of the following languages over the alphabet {a, b}  (a) {(ab)n | n Î N}, which has regular expression (ab)\*.  b) Find a DFA for the language of a + aa\*b. | CO5 | BT3 |

**Note:**

1. **BT Level –** Blooms Taxonomy Level
2. **CO – Course Outcomes**

BT1 –RememberBT2 – Understand BT3 – Apply BT4 – Analyze BT5 – Evaluate BT6 – Create