**SRMINSTITUTE OF SCIENCE AND TECHNOLOGY**

Ramapuram Campus, BharathiSalai, Ramapuram, Chennai - 600089

**FACULTY OF ENGINEERING AND TECHNOLOGY**

# **DEPARTMENT OFCOMPUTERSCIENCEANDENGINEERING**

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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

| **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 |

| **UNITII** | | | |
| --- | --- | --- | --- |
| **Event Driven Programming Paradigm**,Event Object, handler, bind,Keypress events, Mouse events,Automatic events from a timer  Other languages: Algol, Javascript, Elm,Demo: Event Driven Programming inPython  **Declarative Programming Paradigm**,Sets of declarative statements,Object attribute, Binding behavior,Creating Events without describing flow  Other languages: Prolog, Z3, LINQ, SQL,Demo: Declarative Programming in Python  **Imperative Programming Paradigm**I,Program State, Instructions to change the program state,  Combining Algorithms and Data Structures,,Imperative Vs Declarative Programming  Other languages: PHP, Ruby, Perl, Swift  Demo: Imperative Programming in Python | | | |
| **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 |

| **UNITIII** | | | |
| --- | --- | --- | --- |
| **Parallel Programming Paradigm**,Multi-threading, Multi-Processing,Serial Processing, Parallel Processing,Multiprocessing module in Python  Process class, Pool class,Demo: Parallel Programming in Python  **Concurrent Programming Paradigm**,Parallel Vs Concurrent Programming,threading, multiprocessing  concurrent.futures, gevent, greenlets, celery  Other languages: ANI, Plaid  Demo:Concurrent Programming in Python  **Functional Programming Paradigm**,Sequence of Commands, map(), reduce(), filter(), lambda partial, functools  Other languages:F#, Clojure, Haskell  Demo: Functional Programming in Python | | | |
| **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 |