**SRM Institute of Science and Technology Set A**

**College of Engineering and Technology**

**School of Computing**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

**Academic Year: 2022-23 (Even)**

**Test: CLA-T1** **Date: 13-02-2023**

**Course Code & Title: 18CSC204J Design and Analysis of Algorithms** **Duration:**60 mins

**Year & Sem: II Year / IV Sem** **Max. Marks:**25

**Course Articulation Matrix:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **Course Outcome** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | ***2*** | ***3*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** |
| **CO2** | ***-*** | ***3*** | ***2*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** |
| **CO3** | ***-*** | ***3*** | ***3*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** |
| **CO4** | ***3*** | ***2*** | ***3*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** |
| **CO5** | ***2*** | ***3*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** |
| **CO6** | ***-*** | ***2*** | ***3*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** | ***-*** |

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| **Part – A**  **(5 x 1 = 5 Marks)**  **Instructions: Answer all** | | | | | | |
| **Q. No** | **Question** | **Marks** | **BL** | **CO** | **PO** | **PI Code** |
| 1 | What is the advantage of recursive approach than an iterative approach? a) Consumes less memory **b) Less code and easy to implement** c) Consumes more memory d) Easy to test and debug during iteration | 1 | 2 | 1 | 2 | 2.1.1 |
| 2 | Which one is the correct order of increasing growth?  a) O(1), O(log n), O(log log n), O((log n)^2)  b) O(1), O(log log n), O((log n)^2), O(log n)  **c) O(1), O(log log n), O(log n), O((log n)^2)**  d) O(1), O(log n), O((log n)^2), O(log log n) | 1 | 2 | 1 | 2 | 2.3.1 |
| 3 | \_\_\_\_\_\_\_\_\_ refers to an algorithm should be a well defined and ordered procedure that consists of a set of instructions in a specific order.   1. **Definiteness** 2. Correctness 3. Finiteness 4. Effectiveness | 1 | 1 | 1 | 2 | 2.1.1 |
| 4 | Problem solving starts from subproblems of the given problem to the global problem is   1. Top-down design 2. **Bottom-up design** 3. Mixed design 4. Variable design | 1 | 1 | 1 | 2 | 2.2.2 |
| 5 | Which of the following type of algorithm use looping constructs specifically for iterating a set of tasks?   1. Recursive c) Both a and b 2. **Non-recursive** d) Infinite | 1 | 2 | 1 | 1 | 1.1.1 |
| Part – B  (2 x 10 Marks = 20 Marks)  Instructions: Answer any 2 Questions | | | | | | |
| 6 | Babu has six different sets of note books. He arranges note books by comparing its length **only with his previous note** book **every time**. Suggest the suitable comparison sorting algorithm to Babu.A list of unsorted note books is: 78 23 45 8 32 36. Also find the Best and Worst case of the scenario with its time complexity.  **Ans:**  Bubble sort pseudocode (5):  bubble sort.JPG  Dry run: (3)  Sorted: 8 23 32 36 45 78  Time Complexity Analysis: (2)  Best case - O(n)  Worst case - O(n^2) | 10 | 3 | 1 | 2 | 2.2.3 |
| 7 | Determine the time complexity by generating a recurrence relation of a given pseudocode.  fun check(int x)  {  if(x>0)  {  printf(“%d”,x);  check(x-1);  check(x-1);  }} | 10 | 3 | 1 | 2 | 2.3.2 |
| 8 | 1. Consider the following segment and examine the time complexity using operation count method   Algorithm p\_mat(a, r, c)  {  for i:= 1 to r do  {  for j:= 1 to c do  print(a[i][j]);  print( “\n”);  }  }     1. Given f(n)=2n2+n and g(n)=n3. Show that g(n)=Ω(f(n)) and f(n)=O(g(n)) by exhibiting value of c and n0 | 5  5 | 3  3 | 1  1 | 2  2 | 2.3.2  2.2.2 |

**\*Program Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**

**Course Outcome (CO) and Bloom’s level (BL) Coverage in Questions**

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**Approved by the Audit Professor/Course Coordinator**