MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VII SEMESTER B.TECH. (CSE)

END SEMESTER EXAMINATIONS, DECEMBER 2021

SUBJECT: ESSENTIALS OF INDUSTRIAL COMPUTING [CSE 4301]

(Date: 29-12-2021 Time: 2:20 PM – 3:35 PM)

Time: 1.5 Hours **MAX. MARKS: 20**

Instructions to Candidates:

- Answer **ALL** the questions.
- Any data not provided may be suitably assumed.

PART-A

Q. no	Questions	M	CLO	AHEP	Blooms
1	Which of the following is the limitation of unstructured programming? a. Preventing accidental modification of data is limited. b. Code is not close to real world scenario c. The data is local and code operates on it d. Reusability of the code is not supported (A)	0.5	1	3,4,5, 6,16, 18	2
2	_____ is a specialized member method which has the same name as the class and do not have a return type a. Object b. Constructor(A) c. Interface d. package	0.5	1	3,4,5, 6,16, 18	2
3	The Has-A relationship is also known as ____ a. Association b. Inheritance c. Aggregation (A) d. Part-Of relationship	0.5	1	3,4,5, 6,16, 18	2
4	The process of identifying the	0	1	3,4,5,	2

	similarities among different classes is called as ___ a. Generalization (A) b. Specialization c. Polymorphism d. Specification	.5		6,16,18	
5	"A car's dashboard hides the complexity and internal workings of its engine" is an example for _____ a. Abstraction b. Encapsulation (A) c. Message passing d. Polymorphism	0.5	1	3,4,5,6,16,18	2
6	Which of the following statements are true with respect to method overriding? I. The function name and the signature will remain the same as declared in the base class II. It is the concept of same function name with different types of parameters III. The version of the method to be called is decided at runtime depending on the object created. a. I, II b. II, III c. I, III (A) d. I, II, III	0.5	1	3,4,5,6,16,18	2
7	If two or more classes have exactly same member variables and methods, consider a. Keeping all the data members and methods either private or protected b. Shifting the common variables and methods to the base class c. Replacing the common variables and methods with a new class (A)	0.5	1	3,4,5,6,16,18	2

	d. Moving the common variables and methods to the class with which it has a “Part-Of” relationship.				
8	The goodness of the algorithm is usually expressed in terms of its _____ running time. a. Best case b. Average case c. Worst case(A)	0.5	2	2,3,6, 7,16, 18	2
9	_____ of an algorithm is the sum of occurrences of statements contained in it. a. Order of Magnitude(A) b. Analysis c. Selectivity for index d. Priori analysis	0.5	2	2,3,6, 7,16, 18	2
10	Which of the following is NOT included in the life cycle of an algorithm? a. Designing the algorithm b. Writing the algorithm c. Testing the algorithm d. Reviewing the algorithm (A)	0.5	2	2,3,6, 7,16, 18	2
11	_____ Technique is primarily used in Optimization problems. a. Greedy (A) b. Brute force c. Divide and Conquer d. Dynamic Programming	0.5	2	2,3,6, 7,16, 18	2
12	The average case complexity of Binary Search is a. O(n) b. $O(\log_2 n)$ (A) c. $O(n^2)$ d. O(1)	0.5	2	2,3,6, 7,16, 18	2

13	Find the order of magnitude and the running time for the following:
	for(i=0; i<n; i++)
	{
	//assume there are x statements
	
	}
	for(j=0; j<n; j++)
		0.5	2	2,3,6, 7,16, 18	3

	{ for(i=0; i<n; i++)
	{
	if(a>b)
	{ for(j=0; j<n; j++)
	{ //assume there are c statements
	}
	}else
	{ //assume there is one statement
	}
	}
	}
	a. Order of magnitude: nx^2+n^2c
	Running time $O(n^2)$
	b. Order of magnitude: n^4x+nc
	Running time $O(n^4)$
	c. Order of magnitude: nx+nc
	Running time O(n)
	d. Order of magnitude: $nx+n^3c$ (A)
	Running time $O(n^3)$				

14	If the following query. SELECT idno, empno FROM emp1, emp2 WHERE emp1.idno = emp2.empno AND emp2.empno<=100; can be written more efficiently as: SELECT idno,empno FROM emp1 e1, emp2 e2 WHERE e1.idno=e2.empno AND e2.empno<=100; Which SQL tuning technique is applied?? a. Position of table with fewer rows in the select…from query b. Usage of where and having clauses in query c. Usage of Table Aliases (A) d. Usage of Index/Indexes	0.5	2	2,3,6,7,16,18	2

15	The basic principle of Software Engineering is to use A. Same set of methods, same set of tools and a collection of procedures. B. To provide the rules and steps for carrying out tasks. (A) C. To provide manual tools for support D. To unbind the methods and tools into a framework.	0.5	3	5,6,7,9,10,14,15,16,17,18	2
16	What characteristic of the software scenario were described as Software crisis.? A. Hardware sophistication outpaced the ability to build software that completely taps into its potential. (A) B. The ability to build software could keep pace with the demand for new software. C. The ability to maintain existing programs was undermined by good design and haphazard development practices. D. The cost to create the software was not much higher than the initial estimates.	0.5	3	5,6,7,9,10,14,15,16,17,18	2
17	Identify the roles within each software project team. 1 Module Leader. 2 Domain consultant. 3 Reviewer. 4 Architect.	0.5	3	5,6,7,9,10,14,15,16,17,18	2

	A. 1-c,2-a,3-d,4-b (A) C. 1-a,2-b,3-c,4-d B. 1-b,2-c,3-a,4-d D. 1-d,2-c,3-b,4-a				
18	Which phase we describe the communication with the systems that interoperate with the software. A. System Engineering C. Design (A) B. Requirement Analysis D. Deployment	0.5	3	5,6,7,9,10,14,15,16,17,18	2
19	Which type is used in Code Review to identify the potential defects in the code and also to assess whether or not the code adheres to the preset standards. i. Peer review - Done by peers to capture any defects that the author missed. ii. Formal review - done where the code is reviewed by a group having a project leader expert in that domain. iii. Technical review - done by technical team who developed to ensure that there is no defects. iv. Organizational review - done by executive team members who reviewed with client. A. i,iii B. ii, iv C. iii, iv D. i, ii (A)	0.5	3	5,6,7,9,10,14,15,16,17,18	2
20	In which model, we identify the requirements that are known and outline the scope for further definition and focus on design only on the aspects which are visible to the user. A. Waterfall model C. Spiral model B. Prototype model (A) D. Agile model	0.5	3	5,6,7,9,10,14,15,16,17,18	2
2	Which statement is TRUE with	0	5	8,10,	2

1	respect to Web technologies? A. Communication cost of complete topology is always one hop because of indirect communication link. B. Communication cost of a star topology is three hops because data from a source has to traverse to the central node first. C. Communication cost of ring topology depends completely on bi-directional. D. Maximum of all the hops which is calculated taken as the communication cost. (A)	.5		16,18	
22	When all the networks are distinct in nature, which basic issues will not be addressed? A. Routing B. Resilience C. Computational power (A) D. Contention	0.5	5	8,10, 16,18	2
23	What is the goal of a computer network _____ ? A. Computer network is connection of networks. B. Computer network is to transfer data across the different nodes of the network. (A) C. Computer network is to understand different formats of the data. D. All of the specified	0.5	5	8,10, 16,18	2
24	In which layer, we can ensure that all the errors in transmission are detected and are controlled. A. Data link layer (A) B. Network Layer C. Physical Layer D. Session Layer	0.5	5	8,10, 16,18	2
2	To understand the working of	0	5	8,10,	2

5	the internet, i. It is essential to understand the various components and devices that form the physical network. ii. It is essential to understand the software technologies that make the working of the internet possible. A. TRUE, TRUE (A) B. TRUE, FALSE C. FALSE, TRUE D. FALSE FALSE	.5		16,18	
26	The destination node makes a request for the re-transmission of the missing packet and ensures that the message is completely received. A. Frame switching B. Data switching C. Packet switching (A) D. None of the specified	0.5	5	8,10, 16,18	2
27	_____ cannot be terminated or interrupted by conventional user processes. A. Process B. Daemon process (A) C. Server D. Thread	0.5	5	8,10, 16,18	2
28	_____ enforces security of the data by preventing outsiders from interfering with the corporate network. A. Intranet B. Internet C. Virtual private network (A) D. Client-server network	0.5	5	8,10, 16,18	2
29	The sending router's VPN software encrypts the entire packet and places the encrypted information inside another packet for transmission. A. Tunneling (A) B. Firewall	0.5	5	8,10, 16,18	2

	C. Proxy servers D. IP filtering firewalls				
30	_____ is an application level protocol used to deliver virtually all files and other data on the World Wide Web. A. HTML B. HTTP (A) C. GET D. POST	0.5	5	8,10, 16,18	2

PART - B

Q. No	Questions	Marks	CLO	AHEP 4LO	Bloom's
1A.	Illustrate the insertion sort algorithm to sort the following elements in ascending order. Elements are - 5 4 10 2 6 3 Clearly show all the steps	5	2	2,3,6 ,7,16 ,18	3
1B.	Develop a class diagram including associations and multiplicities, based on the following narrative. The Trading System must take care of sales information of the company and must analyze the potential of the trade. A Trading System has the information about the customer such as name, address and phone number, who can place one or more orders. An order can be placed for one or more products at a time. Each product has an ID, name and price. Each order contains the item name, the total number of items ordered and the destination address. Whenever an order is placed the availability of products is checked against the stock. If the products are available then the shipment database is updated. An invoice is generated for each order. Any number of transactions may be done for one order.	3	4	2,3,4 ,5,6, 7,16, 18	6
1C.	Outline the implementation of VPN with a neat diagram.	2	5	8,10, 16,1 8	6

2A.	Design the data flow diagram for payroll system in two levels. In this system, information about the employees in the organization is read into the system, monthly salary and deductions are computed, and payments are made.	5	3	5,6,7,9,10,14,15,16,17,18	6
2B.	The triangle program accepts three integers, a, b, and c, as input. These are taken to be sides of a triangle. The output of the program is the type of triangle determined by the three sides: Equilateral, Isosceles or Scalene. The integers a, b, and c must satisfy the following conditions: c1. $1 \leq a \leq 200$ c2. $1 \leq b \leq 200$ c3. $1 \leq c \leq 200$ If values of a, b, and c satisfy conditions c1, c2, and c3, one of the three mutually exclusive outputs is given: • If all three sides are equal, the program output is Equilateral. • If exactly one pair of sides is equal, the program output is Isosceles. • If no pair of sides is equal, the program output is Scalene. Derive Boundary Value test cases for the above Triangle Problem	3	4	2,3,4,5,6,7,16,18	3
2C.	Elaborate the working of a server with a neat diagram	2	5	8,10,16,18	6