



VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE  
[Central Technological Institute, Maharashtra State]  
Matunga, Mumbai-400 019

SEMESTER EXAMINATION  
SEMESTER & PROGRAM

Mid Semester Examination-Jan 2023  
Sem-I First Year, M.Tech. (CE)

DATE  
TIME

11/01/2023  
10.00 AM to  
11.30 AM  
40

TIME ALLOWED  
COURSE (Course Code)

1.30 Hr  
Program Elective II: Software Engineering

MARKS

Q1. a. Draw the following diagram based on last digit of your 5M CO1  
rollno.

A. Draw deployment diagram of college alumni management system if last digit of your rollno is odd.

B. Draw package diagram of hospital management system if last digit of your rollno is even.

Q1 b. Niksoft EMS is a web-based graphical application provided as 5M CO1  
part of Niksoft LDK that is used to perform a range of functions required to manage the licensing, production, distribution, customer support, and maintenance of protected applications. This application is a role-based application designed to manage the business activities required to implement and maintain Niksoft LDK in the organization which needs to protect its software. Niksoft EMS Server maintains a database containing a wide range of information, including data related to product features, licenses, sales, orders and customers.

The Niksoft EMS handles three major workflows:

1. License planning,
2. Order processing and production, and
3. Activation of trial software.

Product Manager defines Features and Products. Each Product has one or more Features. After Features and Products have been defined in Niksoft EMS, entitlements can be processed and produced using the Production group of functions. Users assigned the Development role can fulfil one of the following development related activities:

- Generate bundles of Provisional (Trial) Products
- Generate a customized Niksoft LDK Run-time Environment (RTE) installer file

- Customize the Niksoft Remote Update System utility (RUS utility)

Entitlement Manager defines and manages customers, and also enters and manages entitlements. An entitlement is the execution of a customer order for Niksoft LDK items, and can be either an order for Products to be supplied with one or more Niksoft protection keys, or a Protection Key Update that specifies changes to be made to the license terms and/or data stored in Niksoft protection keys that have already been deployed.

Customer Services role can manage customers the same way as Entitlement Manager does, and can also manage Product activation. For entitlements that generate Product Keys, the customer receives an email from Niksoft EMS that contains the keys. The customer is able to log in to the EMS Customer Portal using the Product Key in order to activate the Product.

Draw USE CASE Diagram for above scenario

Q2	a. Differentiate between RAD Model and waterfall model	4M	CO1
Q2	b. Justify in detail different CMM levels with purpose	6M	CO1
Q3	a. Draw diagram of process workflow in software development using kanban	5M	CO2
Q3	b. Illustrate extreme programming with release cycle diagram	5M	CO2
Q4	a. Illustrate crystal methodology with features and roles	8M	CO2
Q4	b. Identify & write different types of principles in lean development	2M	CO2



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Programme Name	M. Tech. (Elect), Semester-I CS/PS/IOT/EXTC/COMP/IT
Course Title	ANNML (Open elective)
Date & Time	09/01/2023 10.00-11.30 am
Max Marks:	40

Q		MARKS	CO
1	A What are the five categories of neural network applications?	4	1
	B Discuss any two applications where Neural Networks are used.	6	1
2	A State the differences between Linear Regression and Logistic Regression	4	1
	B What is Reinforcement Learning? Explain recent Covid-19 time reinforcement learning applications to healthcare area.	6	1
3	A Attempt any one of the following (Draw relevant graph model for the situations given and suggest algorithm wherever needed and study possible with it		
	i In Neural Networks a series of algorithms that attempt to identify underlying relationships in a set of data by using a process that mimics the way the human brain operates.	4	1
	ii Graph theory can be used in computer networks, for security purpose or to schematize network topologies and providing path from Source to Destination in a dynamic situation.	4	2
	B State the difference between regression and classification algorithms	6	1
4	A What common software problems can lead to network defects?	6	2
	B Consider a graph $G = (V, E)$ , where $V = \{v_1, v_2, \dots, v_{100}\}$ , $E = \{(v_i, v_j) \mid 1 \leq i < j \leq 100\}$ , and weight of the edge $(v_i, v_j)$ is $ i - j $ . The weight of the minimum spanning tree of $G$ is _____	4	2



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SEMESTER EXAMINATION **MST-Jan 2023**  
SEMESTER & PROGRAM **1 sem, MTech(CE)**  
TIME ALLOWED **1.5 HRS**  
COURSE : **Cloud Computing**

DATE OF EXAM : **14/1/2023**  
TIME : **10.00am-11:30pm**  
MARKS : **40**

- Instructions
1. All questions carry equal marks.
  2. Figures to the right indicate full marks.

- Q.1 ☒ a What are the cloud services models offered by vendors? Explore in brief. (5)  
☒ b How Cloud computing Model is different from distributed computing, Cluster Computing, Grid Computing and Utility Computing models (5)
- Q.2 ☒ a. What is containerization? Compare virtualization and containerization on performance and usability metrics. (5)  
☒ b Explain microkernel architecture and monolithic architectures. (5)
- Q.3 ☒ a What does it mean scalability in cloud? Define scaleup, speedup and size up (5)  
☒ b What is the voluminous data processing architecture cloud computing uses? is any relation of this with cloud file system? Explore. (5)
- Q.4 ☒ a What is SLA ? What are the considerations for SLA ? (5)  
☒ b Why Map-Reduce model is so important in cloud application development? (5)  
Explore any case study with Map-Reduce development approach.

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EXAMINATION	Mid Semester Examination (MST) January 2023	DATE OF EXAM	10 January 2023
SEMESTER & PROGRAM	Sem-I, First Year MTech (Computer Engineering)	TIME	10.00 AM to 11.30PM
TIME ALLOWED	1 Hr and 30 Mins.	MARKS	40
COURSE NAME - (CODE)	Computer Systems Performance Analysis (I)		

- Instructions
1. All questions carry equal marks.
  2. Figures to the right indicate full marks.

- Q.1 a. List out systematic approach to performance evaluation (06)(CO1)  
b. The number of disk I/O's performed by a number of programs were (04)(CO3)  
measured as follows: {23, 33, 14, 15, 42, 28, 33, 45, 23, 34, 39, 21, 36, 23, 34, 36, 25, 9, 11, 19, 35, 24, 31, 29, 16, 23, 34, 24, 38, 15, 13, 35, 28}. Which index of central tendency would you choose and why.
- Q.2 a. Table 1 shows execution times of three benchmarks I, J, and K on three (06)(CO2)  
systems A, B, and C. Use ratio game techniques to show the superiority of various systems.

Table 1 : Raw Execution Times

Benchmark	System A	System B	System C
I	50	100	150
J	100	150	50
K	150	50	100
Sum	300	300	300
Average	100	100	100

- Q.3 a. What are the criteria for selecting an evaluation technique. (04)(CO1)  
b. Make a complete list of Metrics to compare (12)(CO2)  
a. Two personal computers  
b. Two database systems.  
c. Two Disk drives  
d. Two languages: C versus Python.
- b. The traffic arriving at a network gateway is bursty. The burst size  $x$  is (08)(CO3)  
geometrically distributed with the following pmf.  
 $f(x) = (1-p)^{x-1} p$ ,  $x=1, 2, \dots, \infty$ .  
Compute the mean, variance, standard deviation, and coefficient of variation of the burst size.

$$\rightarrow (1-p)^{x-1} \cdot p$$



## VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE

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EXAMINATION	Mid Semester Examination (MST) January 2023	DATE OF EXAM	13/01/2023
SEMESTER & PROGRAM	Sem-I, First Year M Tech (Computer Engineering / Software Engineering)	TIME	10:00 TO 11:30
TIME ALLOWED	1.5 HRS.	MARKS	40
COURSE NAME – (CODE)	Advanced Algorithm		

- Instructions
1. All questions carry equal marks.
  2. Figures to the right indicate full marks.

Q.1	a	<pre>int knapSack(int W, int wt[], int val[], int n) {     if (n == 0    W == 0)         return 0;     if (wt[n - 1] &gt; W)         return knapSack(W, wt, val, n - 1);     else         return max(val[n - 1] + knapSack(W - wt[n - 1], wt, val, n - 1),                     knapSack(W, wt, val, n - 1)); }  val[] = { 60, 100, 120, 180, 200 }; wt[] = { 10, 20, 30, 50, 60 }; W = 100;</pre> <p>In above code snippet, given set of items and knapsack capacity = 100 kg. Find the optimal solution for the knapsack problem using a dynamic programming approach and also give the time complexity of the same.</p>	3M	CO [1,2]
	b	<p>For the following code snippet, calculate time complexity step by step and show using asymptotic notation.</p> <pre>powerof2(n) {</pre>	2M	CO [1,3]

		<pre> if n = 0     return 1 else     return powerof2(n-1)+ powerof2(n-1) } </pre>		
	✓	Explain Prim's Minimum Spanning Tree Algorithm with an example	5M	CO [2]
	✓	Explain Longest Common Sub-sequence problem using dynamic programming.	10M	CO[2]
Q.2	✓	Give systematic solution to fractional knapsack problem using greedy method	10M	CO[2]
	✓	Write detailed analysis of insertion sort in the worst case.	5M	CO [1, 3]
	✓	Prove circuit-satisfiability problems belong to the class NP and NP-hard.	5M	CO [4]