CSE

21

Reg.No.:								

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5026

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Seventh Semester
Computer Science and Engineering
U19CS731 – MOBILE COMPUTING
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Give any two applications of mobile computing.	2	K2	CO1
2.	Differentiate between mobile computing and wireless networking.	2	K2	CO1
3.	What are the challenges of IP for mobility?	2	K1	CO2
4.	What are the limitations of TCP for mobility?	2	K1	CO2
5.	What are the protocols used for message transfer?	2	K1	CO3
6.	What is HLR in GSM?	2	K2	CO3
7.	Why is security important in Ad-Hoc Network?	2	K2	CO4
8.	List any two applications of Mobile Ad-Hoc Networks.	2	K2	CO4
9.	List any two popular Mobile Operating System.	2	K2	CO5
10.	Sate a few challenges of using Mobile Device Operating Systems.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Discuss the various characteristics of Mobile Computing.	13	K2	CO1
		(OR)			
	b)	Elaborate various issues in using wireless MAC with suitable case study.	13	K3	CO1
12.	a)	Explain the key mechanism in Mobile IP with suitable illustration.	13	K2	CO2
		(OR)			
	b)	Discuss the adaptation of TCP Window to support mobility.	13	K2	CO2
13.	a)	Explain the architecture of GSM with a neat sketch.	13	K2	CO3
		(OR)			
	b)	Discuss the working of GPRS. In your opinion, which type of data transmission technique is effective in GPRS?	13	K3	CO3
14.	a)	What are the design issues in Mobile Ad-Hoc Networks and suggest a few possible potential solutions to overcome the issues.	13	K2	CO4
		(OR)			
	b)	Differentiate between VANET and MANET. Design a network architecture that combines strengths of both VANET and MANET to create a reliable environment.	13	K3	CO4
15.	a)	Discuss the constraints and requirements of a Mobile Device Operating System.	13	K2	CO5
		(OR)			
	b)	Discuss the Android SDK for Mobile Application development with a case study.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Discuss the popular routing protocols for Mobile Ad-Hoc Networks. Design a hybrid routing protocol by combining the strength of reactive and proactive protocols for UAV.	15	K3	CO4
		(OR)			
	b)	Discuss the classification of MAC protocols in Mobile computing environment. Imagine you are designing a wireless network to support real-time applications such as video and voice. Would you choose a contention-based or contention-free MAC protocol? Reason out with proper justification.	15	K2	CO1

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Question Paper Code: 5021

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Fifth Semester
Computer Science and Engineering
U19CS520 – COMPUTER NETWORKS
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

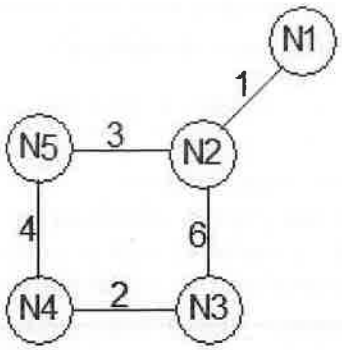
(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Which TCP/IP layer is responsible for node to node data transfer?	2	K1	CO1
2.	What is the transmission media and bit rate for 100base-FX Ethernet LAN?	2	K2	CO1
3.	There are n stations in a slotted LAN. Each station attempts to transmit with a probability p in each time slot. What is the probability that NO station transmits in a given time slot?	2	K3	CO2
4.	What is the sub network address if the destination address is 200.45.34.56 and the subnet mask is 255.255.240.0?	2	K3	CO2
5.	State two basic differences between link state and distance vector routing.	2	K1	CO3
6.	What is the use of Sequence number and TTL field in link state packet?	2	K2	CO3
7.	How does UDP address flow control mechanism?	2	K3	CO4
8.	List the advantages of connection-oriented services over connectionless services.	2	K4	CO4
9.	Consider different activities related to email. m1: Send an email from a mail client to a mail server m2: Download an email from mailbox server to a mail client Write the application layer protocols for m1 and m2 respectively	2	K2	CO5
10.	State the difference between persistent and non-persistent HTTP.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Consider two hosts X and Y, connected by a single direct link of rate 10^6 bits/sec. The distance between two hosts is 10000 km and the Propagation of the link is 2×10^8 m/s. Host X sends a file of 50 Kb to host Y. Calculate the transmission delay and propagation delay.	7	K3	CO1
		ii.	Compare different transmission media in terms of bandwidth, delay and noise. What is the bandwidth and transmission mode for 100base-T Ethernet LAN?	6	K3	
			(OR)			
	b)	i.	State the difference between packet-switched and circuit-switched networks with examples. State the advantages and disadvantages of Bus and Ring topology.	9	K2	CO1
		ii.	Calculate the roundtrip delay of transmitting a packet of size 10KB across a link of 1Mbps (assume one-way propagation delay is 20 msec)	4	K4	
12.	a)	i.	Describe Slotted ALOHA protocol. Derive the maximum utilization/throughput of slotted ALOHA protocol.	8	K2	
		ii.	Two parties uses the Stop-n-Wait ARQ for reliable transmission of frames with piggybacking. Frames are of size 1000 bytes and transmission rate is 10 Mbps. Size of an acknowledgement (ACK) is 10 bytes and the one-way propagation delay is 20 microsecond, if probability of frame loss is 2%, what will be the channel utilization?	5	K4	CO2
			(OR)			
	b)	i.	Describe CSMA/CD protocol. Explain functioning of MACAW protocol with a clear diagram.	8	K2	
		ii.	Suppose the round trip propagation delay for a 8 Mbps Ethernet having 48-bit jamming signal is 45 μs. Find the minimum frame size. What is the limit of window size for selective repeat ARQ in terms of number of bits used for frame sequence?	5	K4	CO2
13.	a)	i.	Consider the network in Figure.	8	K4	CO3



Following distance vectors at different nodes after stabilization of the network:
N1:(0,1,7,8,4)

N2:(1,0,6,7,3)

N3:(7,6,0,2,6)

N4:(8,7,2,0,4)

N5:(4,3,6,4,0)

In each round, all nodes exchange their distance vectors with their respective neighbors. Then all nodes update their distance vectors. In between two rounds, any change in cost of a link will cause the two incident nodes to change only that entry in their distance vectors. The cost of link N2-N3 reduces to 2 (in both directions). After the next round of update what will be the new distance vector at node, N3?

	ii.	Suppose CIDR block is 200.20.11.144/27. What are the first and last addresses (including broadcast address) of this block? Compare the performance of Distance vector and Link State Routing.	5	K3	

(OR)

b)	i.	Explain Multicast Routing protocol DVMRP.	5	K4	CO3
	ii.	Describe Link state Routing Protocol with an example. What do you mean by count-to-infinity problem in distance vector routing? Propose a solution to it.	8	K2	
14. a)	i.	Describe 3-way handshaking process for TCP connection establishment. An instance of SYN flooding attack is that a sender sends large number of SYN packets with spoofed IP address to a server for connection establishment. In the process, server connection buffer becomes full and thereby can't accept legitimate connections. Propose a solution to detect and control SYN-Flooding.	6	K3	CO4
	ii.	Describe TCP Reno-Tahoe congestion control process. Derive the expression for steady state TCP throughput (where, M is the maximum segment size, L is the loss rate, T is RTT).	7	K4	

(OR)

b)	i.	Write the pseudocode for Slowstart and Additive Increase for TCP congestion control. Explain with an example. State the 3-way handshaking for TCP connection establishment with a clear diagram.	6	K3	CO4
	ii.	Suppose that the TCP congestion window is set to 20 KB and a timeout occurs. How big will the window be if the next four transmission bursts are all successful? Assume that the maximum segment size is 1 KB.	7	K3	

15. a)	i.	How does a computer decide whether an incoming IP packet is HTTP or FTP? Explain the functioning of respective protocols for email transfer and email reading.	7	K2	CO5
	ii.	What is the role of DNS server? What is DNS flooding?	6	K3	
		(OR)			
b)	i.	How does a computer decide whether an incoming IP packet is Telnet or FTP? Explain the functioning of HTTP and FTP protocols.	7	K1	CO5
	ii.	What is the role of DNS server? What is DNS flooding?	6	K2	

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16. a)	i.	Consider a packet-switched, store-and-forward network consisting of three nodes, (two endnodes A and B and one intermediate node I with unlimited buffer capacity), and two transmission links L1 (A-I) and L2 (I-B). The first link has bandwidth W1bits/sec and propagation delay $\tau 1$; the second link has bandwidth W2bits/sec and propagation delay $\tau 2$. Node A has a file of M bits to be transmitted to node B. Each packet has a fixed size header of H bits and a data field of maximum size equal to P bits. Node A starts to send the file at time t= 0. Find the time at which node B receives the entire file (study different cases in function of which bandwidth is the bigger one and also in function of the size M of the file).	8	K3	CO2
	ii.	Describe functioning of BGP routing protocols. Analyze performance of this protocol.	7	K4	CO3
		(OR)			
b)	i.	A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Assume that time is slotted in units of 40 msec. What is the chance of success on the first attempt? What is the probability of exactly k collisions and then a success? What is the expected number of transmission attempts needed?	8	K3	CO2
	ii.	Describe functioning of Sliding window based Flow control protocol. Analyze performance of this protocol.	7	K4	

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Question Paper Code: 5029

B.E. / B.Tech DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Fifth Semester
Computer Science and Engineering
U19CS522 - THEORY OF COMPUTATION
(Regulation 2019)

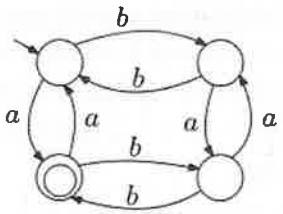
Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Find the language accepted by the following finite automaton. 	2	K2	CO1
2.	Draw a finite automaton to represent x*, where $x \in \Sigma = \{a,b\}$.	2	K2	CO1
3.	Write regular expression to represent the set of all strings over $\Sigma = \{0, 1\}$ where every string has a substring "0101".	2	K2	CO2
4.	Given the language $L= \{0^n1^n \mid n>=1\}$; Can there be a DFA possible for the language? Justify your answer.	2	K1	CO2
5.	Is the following grammar ambiguous? Justify your answer. $S \rightarrow aB\|bA,\ A \rightarrow aS\|bAA\|a,\ B \rightarrow bS\|aBB\|b$	2	K4	CO3
6.	Write a context free grammar to generate the following language: $L =\{ww^R$ Where $w \in \{a, b\}^*\}$.	2	K3	CO3
7.	Differentiate deterministic pushdown automaton and non-deterministic pushdown automaton.	2	K2	CO4
8.	Convert the following CFG to an equivalent pushdown automaton. $S \rightarrow a\ S\ b \mid b\ S\ a \mid \in$	2	K3	CO4
9.	Is the set of all Turing machines countable? Justify your answer.	2	K4	CO5
10.	What is meant by universal Turing machine?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Construct a deterministic finite automaton accepting the following language L. L = {w ∈ {a, b}* : such that the number of a in w is divisible by 2 and the number of b in w is divisible by 3}.	8	K2	CO1
		ii.	Show that for every NFA with an arbitrary number of final states there is an equivalent NFA with only one final state.	5	K3	
			(OR)			
	b)	i.	Consider the nondeterministic finite automaton given by $\Sigma = \{0, 1\}$, $Q = \{A, B\}$, $F = \{A\}$, $q_0 = A$, and $\delta(A, 0) = \{A, B\}$, $\delta(A, 1) = \{B\}$, $\delta(B, 0) = \{B\}$, $\delta(B, 1) = \{A\}$. Find the corresponding equivalent deterministic finite automaton.	7	K3	CO1
		ii.	Let, $L \in \Sigma^*$. We define the following language: Suff (L) = $\{w \in \Sigma^* : x = yw$ for some $x \in L, y \in \Sigma^*\}$. Show that if L is accepted by some finite automaton, then so is the above-defined language Suff(L).	6	K4	
12.	a)	i.	Write regular expressions for the following languages on $\Sigma = \{a,b\}$. 1) Set of all strings containing exactly one a. 2) Set of all strings containing an even number of a's.	6	K2	CO2
		ii.	State the pumping lemma for regular languages and use it to prove that $L = \{ww^R : w \in \Sigma^*\}$ is not regular.	7	K3	
			(OR)			
	b)	i.	Consider the following regular expression and simplify it. $(0+1)^* 10 (0+1)^* + (0+1)^* 11 (0+1)^*$	4	K2	CO2
		ii.	Show that regular languages are closed under union, intersection and set difference operations.	9	K3	
13.	a)	i.	Write a context free grammar to generate the following language: $L = \{0^m 1^m 2^n \mid m >= 1$ and $n >= 1\}$.	6	K2	CO3
		ii.	Construct a context-free grammar G such that L(G) = {w ∈ {a, b}* : w has even number of a's and odd number of b's}.	7	K3	
			(OR)			
	b)	i.	State the pumping lemma of context free languages. Show that the language $L = \{a^p : p$ is a prime$\}$ is not context free.	7	K2	CO3
		ii.	Convert the following context free grammar to Chomsky normal form. $S \rightarrow AB \mid aB$, $A \rightarrow aab \mid E$, $B \rightarrow bbA$	6	K3	

14.	a)	i.	Define "acceptance by final state" and "acceptance by empty stack" as used to design pushdown automaton (PDA). Show with examples.	6	K3	CO4
		ii.	Construct a pushdown automaton M such that $L(M) = \{w \in \{a, b\}^* : w = w^R\}$	7	K4	
			(OR)			
	b)	i.	Design a pushdown automaton (PDA) to accept the following language: $L = \{0^n 1^m 0^n : m, n \geq 1\}$.	7	K3	CO4
		ii.	Design a *pushdown automaton* (PDA) with minimum number of states to accept the language: $L = \{a^n b^{2n} : n \geq 0\}$.	6	K4	
15.	a)		Design a Turing machine to add two non-zero integers and to write the result in the tape after the input integers (use a symbol to separate the inputs and output).	13	K2 K3	CO5
			(OR)			
	b)	i.	Consider one variant of Turing machine where the machine must always write a symbol different from the one it reads. So, if $\delta(q_i, a) = (q_j, b, \rightarrow / \leftarrow)$, then a is not equal to b. Here, $\rightarrow$ and $\leftarrow$ indicates the movements of the R/W head in Right and Left respectively. Does this limitation reduce the power of the machine with respect to standard Turing machine? Justify.	7	K4	CO5
		ii.	Define *recursive* and *recursively enumerable* languages and give examples.	6	K2	

PART – C

(1 x 15 = 15 Marks)

Q.No.			Questions	Marks	KL	CO
16.	a)	i.	Differentiate *decidable* and *undecidable* languages with examples.	5	K1	CO5
		ii.	Prove that $L = \{ b^n a^n b^n \mid n \geq 0 \}$ is decidable by giving a description of a Turing machine to decide the language L. Discuss the working of the machine in detail showing the READ , WRITE activities on tape.	10	K4	
			(OR)			
	b)	i.	Prove that $L = \{b^n a^n b^k c^k \mid n \geq 0, k \geq 0\}$ is a context free language (CFL) using closure properties of CFL.	6	K3	CO3
		ii.	Design a pushdown automaton for the language $L = \{b^n a^n b^k c^k \mid n \geq 0, k \geq 0\}$.	9	K4	

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Question Paper Code: 5032

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Fifth Semester
Computer Science and Engineering
U19CSE02 – CYBER SECURITY
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	A user is trying to connect with his bank account. While connecting with the bank (online) via a browser, is it possible for session hijacking? How to prevent if identified?	2	K3	CO1
2.	What is meant by data remanence? Is data-remanence a concern in RAM?	2	K2	CO1
3.	How IP trace back techniques are used to trace anonymous packet flooding attacks. Recall the concept of iTrace.	2	K4	CO4
4.	Provide the objectives of cyber security star model?	2	K3	CO3
5.	Mention the need for a security policies.	2	K2	CO1
6.	Differentiate Plan-Control and Configuration Control policies.	2	K3	CO3
7.	How sticky bit is used to avoid deletion of critical folders and their content (sub-folders), relate with example.	2	K3	CO2
8.	How taint analysis is carried out to detect SQL injection vulnerability. Give an example.	2	K3	CO2
9.	Whether metadata is important in a file system forensics. Provide your inference.	2	K3	CO2
10.	Outline about cyber stalking and a method for prevention.	2	K2	CO1

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Discuss in brief following types of access control: Mandatory i. Discretionary ii. Role based iii. Rule based iv. Attribute based	13	K4	CO1
		(OR)			
	b)	How attack tree and attack graph are used to conduct web application vulnerabilities. Develop an attack tree showing the ways by which web site of an organization can be hacked by XSS attack.	13	K3	CO1
12.	a)	In the Parkerian hexad, three additional attributes were added to the three classic security attributes of the CIA triad. Discuss why?	13	K3	CO2
		(OR)			
	b)	What is the use of Risk Management Frame work (RMF)? With a clear diagram explain the various steps involve in it.	13	K3	CO2
13.	a)	Discuss the lacuna in the human readable web site policy. How P3P is fruitful for web policy enforcement? Discuss Basic components of P3P.	13	K3	CO3
		(OR)			
	b)	Explain difference between external security audit & internal security audit.	13	K3	CO3
14.	a)	How session hijacking and fixation is carried out by malicious user? Explain. Does https prevent session hijacking?	13	K3	CO4
		(OR)			
	b)	Differentiate between Code Review and Sandboxing. Sandboxing does not address inherent vulnerabilities such as buffer overflow and programs may still suffer from attacks that allow the execution of an attacker's injected machine code. What, then, is the rationale for sandboxing?	13	K3	CO4
15.	a)	How Snort is used as a network-based intrusion detection system (NIDS) during forensics investigation. Write a snort rule to alert traffic from outside the 10.1.1.x subnet to 10.1.1.x subnet with Syn and Fin flag set.	13	K4	CO5
		(OR)			

	b)	How an abstract digital forensics model provides a consistent and standardized framework that supports all stages of an investigation. Explain how this model is used by law enforcement agencies to investigate email fraud.	13	K4	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	You fire up Wire shark and you see the following Ethernet frames interpretation:	15	K4	CO4

Time	Origin	Destination	Interpreted Contents

191.5 00:0e:0c:05:86:f7 00:00:00:00:00:00 "Who has 128.148.34.7 Tell 128.148.34.6"

191.6 00:0c:76:b2:84:08 00:03:0c:05:86:f7 "28.148.34.7 is at 00:0c:76:b2:84:08"

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i. From the given code snippet, identify the type of protocol and in which layer the protocol is used.

ii. 00:00:00:00:00:00 is the Ethernet local broadcast address. Why is the first packet sent to a broad cast address, but the second isn't.

(OR)

	b)	Explain the purpose of the following in investigation process. i. Cross-drive analysis ii. File carving iii. Audit trail iv. Banner grabbing	15	K3	CO2

Library

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Question Paper Code: 7037

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Fifth Semester
Computer Science and Engineering
U19ECOE3 – AUTOMOTIVE ELECTRONICS
(Regulation 2019)

Time: Three Hours Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	A memory chip has 8 data lines and 16 address lines. What is its size in bytes?	2	K2	CO1
2.	What are the characteristics of position sensors?	2	K2	CO1
3.	What is the classification of the bus system?	2	K2	CO2
4.	Based on the electric/electronics point of view, how the vehicle systems are classified?	2	K3	CO2
5.	Draw the organizational structure of drive train management.	2	K2	CO3
6.	Mention the advantages of vehicles with ESP.	2	K3	CO3
7.	What is the importance of electronic immobilizer?	2	K3	CO4
8.	Mention the benefits of active steering for the driver	2	K2	CO4
9.	Write the difference between bus and star topology.	2	K2	CO5
10.	How the fault or format error can be addressed if it is detected by the CAN controller?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Explain the followings:			
		i. List the difference between BJT and MOSFET.	6	K2	CO1
		ii. Write the design and operating principle of Hall phase sensors. Mention a few applications.	7	K3	
		(OR)			
	b)	Explain the followings:			
		i. Explain the various types of opto couplers and their role in circuit design.	7	K2	CO1
		ii. Write the design and operating principle of steering-angle sensors.	6	K3	
12.	a)	Explain the different layers of the OSI reference model and explain briefly about each layer.	13	K2	CO2
		(OR)			
	b)	Explain the network organization. Mention its different addressing modes.	13	K2	CO2
13.	a)	Answer the followings:			
		i. Discuss the input and output variables measured and controlled in the electronic engine control system.	7	K3	CO3
		ii. Explain the structure of the traction control system with a diagram.	6	K2	
		(OR)			
	b)	Write about the TCS controller concept for a four-wheel-drive vehicle. Explain its advantages.	13	K3	CO3
14.	a)	Write about the following:			
		i. Write the main components of the electronic control of a diesel engine.	7	K2	CO4
		ii. Write the basic functions of lambda closed-loop control for passenger-car diesel engines	6		
		(OR)			
	b)	Describe			
		i. The fuel injection process in the ECU.	7	K3	CO4
		ii. Torque-controlled EDC systems	6	K2	
15.	a)	By diagram, explain the CAN protocol layers. Write the CAN message format.	13	K2	CO5
		(OR)			
	b)	Explain Bluetooth, its application, and topology.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Write about the following:			
		i. Compare the design and operating principles of high-pressure and temperature sensors.	7	K3	CO1
		ii. Discuss the functioning and advantages of an electronic steering control system. How is it different from traditional power steering systems?	8	K2	CO4
		(OR)			
	b)	Explain the followings:			
		i. With the help of a block diagram, discuss the components and working of an electronic fuel control system.	8	K3	CO2
		ii. Draw the simplified block diagram showing the ESP controller with input and output variables. Explain in detail.	7	K2	CO3

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 6024

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Fifth Semester
Computer Science and Engineering
U19ITOE7 – BUSINESS INTELLIGENCE AND ITS APPLICATIONS
(Regulation 2019)

Time: Three Hours Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What is the difference between data, information, and knowledge?	2	K2	CO1
2.	What are the factors that influence rational choice?	2	K1	CO1
3.	Define Data Profiling.	2	K1	CO2
4.	What is the need for BI?	2	K2	CO2
5.	What are the operations involved in OLAP?	2	K1	CO3
6.	Define Fact Table.	2	K1	CO3
7.	Differentiate Scorecards vs. Dashboards	2	K2	CO4
8.	What are the performance metrics in BI? Why are they important?	2	K2	CO4
9.	What is cloud BI?	2	K1	CO5
10.	What is business intelligence in ERP system?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	What is business intelligence? Draw a neat diagram to represent engineering stages and development steps in BI and explain briefly.	13	K2	CO1

(OR)

	b)	What is Digital Data? Write down the difference between semi-structured, structured data, and unstructured data.	13	K2	CO1
12.	a)	Compare and contrast Ralph Kimball's Approach and W.H. Inmon's Approach. Which approach should you choose when designing your data warehouse architecture?	13	K2 K3	CO2
		(OR)			
	b)	Describe the process of ETL in detail. Write down the potential of ETL and BI Together.	13	K2	CO2
13.	a)	What is a Data Model? Explain any two data modeling techniques with examples.	13	K2	CO3
		(OR)			
	b)	Draw OLAP Architectures and explain their types in detail.	13	K2	CO3
14.	a)	Describe in detail about Report Standardization and Presentation Practices.	13	K2	CO4
		(OR)			
	b)	What are key performance indicators? How KPIs drive performance in business intelligence.	13	K2	CO4
15.	a)	What are the key purposes of using IT in Business Processes? and brief them.	13	K2	CO5
		(OR)			
	b)	Explain Actionable knowledge with respect to Return on Investment (ROI) and BI applications.	13	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Consider this scenario: You have been tasked with building a data mart for the purpose of analyzing a customer value portfolio based on all customer interactions, ranging from telephone inquiries to purchases, returns, customer service calls, payment history, etc. On the one hand, you must determine what organizations are going to be supplying data, how and when the data sets are to be supplied, and how the data is to be organized and modified for integration into the data mart. In addition, you must be able to manage the quick integration of new data sets when it is determined that they are to be included in the data mart. Alternatively, you must be able to manage the provision of information services to the business analysts, each of which may be logically or physically situated in a different location.	15	K3 K4	CO3

i. What data is to be propagated along the data mart, and what kinds of applications are using that data?

ii. Describe information flows into and out of the system to provide a tracking mechanism to back up any conclusions that are drawn through data analysis.

(OR)

b)	On a recent plane trip, you struck up a conversation with the man sitting next to you, who told you that he was in the business of buying and selling large construction equipment to different companies around the world. He described to you how he built his business by cleverly creating a database to track construction companies and equipment and the corresponding ownership relationship. When he saw that one company might be starting a new project, he would contact them and see what kind of equipment they might need, and he was then able to search the database for those companies that owned that particular piece of machinery. Interestingly, he built this database by scanning through publicly available documents, such as corporate asset listings, and Uniform Commercial Code (UCC) lien filings, looking for references to an ownership relationship between a machine and a company. Every time he brokered a transaction, he also updated his own database. By doing this, not only was he able to keep track of who owned what, but he could also track the history of the machine, from its original construction (via serial number) through each subsequent owner. With this knowledge at his fingertips, he had successfully created a niche business in machinery exchange, enabling faster convergence on brokered deals. This is a good example of the exploitation of public data for business value.	15	K4	CO5

i. Based upon the above scenario, explain the usage of publicly available data for BI.

ii. List out the issues while managing semi-structured data.

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[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5025

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Third Semester
Computer Science and Engineering
U19CS305 – DATABASE MANAGEMENT SYSTEMS
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Give an example of one to one and one to many relationship.	2	K1	CO1
2.	Mention the purpose of data dictionary? List any six applications of DBMS.	2	K2	CO1
3.	Depict a Schema diagram and mention its attributes.	2	K2	CO2
4.	With an example, write the significance of primary key.	2	K1	CO2
5.	Normalization of data is to be done for all the tables or not? Reason out.	2	K2	CO3
6.	What is meant by computing the closure of a set of functional dependency?	2	K2	CO3
7.	Provide various states of a transaction? List out the statements that are associated with a database transaction.	2	K1	CO4
8.	Give the reasons for allowing concurrency.	2	K1	CO4
9.	How are transactions performed in Object oriented database?	2	K2	CO5
10.	State the function of XML schema.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	List and explain various data models that are used for database design.	8	K1	CO1
		ii.	What is 'a view' and how can be related to data independence?	5	K2	CO1
			(OR)			
	b)	i.	With a neat diagram describe the overall system structure of DBMS.	8	K1	CO1
		ii.	Write short notes on DBA.	5	K2	
12.	a)	i.	Consider the following relational schema for a banking system: branch (branch_name, branch_city, assets) customer (customer_name, customer_street, customer_city) account (account_number, branch_name, balance) loan (loan_number, branch_name, amount) depositor (customer_name, account_number) borrower (customer_name, loan_number) Write the relational algebra for the queries: 1. Find the loan number for each loan of an amount greater than Rs 1000, 2. Find the names of all customers who have a loan at the ``SBI'' branch, 3. Find the smallest account balance.	10	K4	CO1
		ii.	Where does "the integrity rules" are applicable?	3	K5	
			(OR)			
	b)		Explain the following four SQL constructs with examples: order by; group by and having; as select; schema.	13	K4	CO1
13.	a)	i.	What is Functional Dependency?	2	K1	
		ii.	Define and explain 3NF, BCNF (Boyce-Codd Normal Form), 4NF and 5NF relation.	11	K2	CO2
			(OR)			
	b)		Normalize the following table R up to BCNF.. Show all work and clearly indicate the primary and foreign keys. R(elevator_no, building_no, building_name, capacity, staff_no, first_name, last_name, date_examined) with the following functional dependencies:	13	K6	CO3

1. elevator_no → building_no,capacity
2. building_no → building_name
3. staff_no → first_name,last_name
4. elevator_no,staff_no → date_examined

14.	a)	i.	List and explain various issues while transactions are running concurrently in DBMS.	7	K1	CO4
		ii.	Write short notes on Simple 2 phase Locking, Strict 2 phase Locking, Rigorous 2 phase Locking.	6	K2	
			(OR)			
	b)	i.	Two transactions are *not interleaved* in a schedule if every action of one transaction precedes every action of the other. We say transaction T1 *precedes* T2 if they are not interleaved, and all actions of T1 precede actions of T2. Give an example of a conflict serializable schedule H that has the following properties: a. transactions T1 and T2 are not interleaved in H; b. T1 precedes T2 in H; and c. in any serial schedule conflict equivalent to H, T2 precedes T1. The schedule may include more than 2 transactions and you do not need to consider locking actions. Please use as few transactions and read or write actions as possible.	5	K4	CO5
		ii.	Explain Concurrency control with locking methods.	8	K2	
15.	a)		Discuss in detail on the recovery techniques that can be applied to the common types of database failure.	13	K2	CO5
			(OR)			
	b)	i.	Compare and contrast between object oriented and XML databases.	7	K2	CO5
		ii.	Give XML representation of bank management system and also explain Document Type Definition and XML schema.	6	K4	

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16	a)	Design an E-R diagram of a Online shopping system. You must describe it also.	15	K6	CO1
		(OR)			
	b)	Design an E-R diagram of a flight reservation system. Detail all the attributes pertaining to the given application.	15	K6	CO1

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 2006

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Third Semester
Computer Science and Engineering
U19MA304 - DISCRETE MATHEMATICS
(Common to Information Technology & Computer Science and Technology)
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

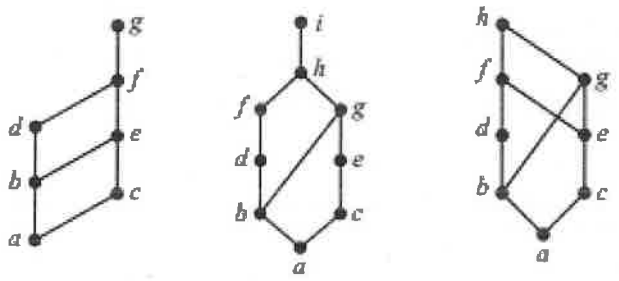
(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Give the contrapositive of the statement "All squares are rectangles".	2	K2	CO1
2.	Build principal disjunctive normal form of $\neg P \vee Q$.	2	K3	CO1
3.	List the negation of the statement: "Some student in this class has studied JAVA".	2	K2	CO2
4.	What is instantiation? Give a valid example to demonstrate it.	2	K1	CO2
5.	Define absorption law in set theory.	2	K1	CO3
6.	Construct a Hasse diagram for the partial ordering $(\{1, 2, 3, 4, 6, 8, 12\})$.	2	K3	CO3
7.	Let $f(x) = ax + b$ and $g(x) = cx + d$, where a, b, c and d are constants. For which constants a, b, c and d it is true that $f \circ g = g \circ f$.	2	K1	CO4
8.	Find a recurrence relation and give initial conditions for the number of bit strings of length n that do not have two consecutive zeros.	2	K1	CO4
9.	Find whether the set of rational numbers Q is a semigroup for operation $*$ defined by $a * b = \frac{ab}{2}$ $\forall a, b \in Q$. Justify the result.	2	K1	CO5
10.	Illustrate an example of a set which is not a group under the operation of addition.	2	K2	CO5

PART – B

(5 x 16 = 80 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Write the PDNF and PCNF of the statements: 1) $(\neg p \rightarrow r) \wedge (q \leftrightarrow p)$ 2) $p \rightarrow ((p \rightarrow q) \wedge \neg (\neg q \vee \neg p))$	8	K3	CO1
		ii.	Make use of rules of inference, determine the validity of the following premises: "If it does not rain or if it is not foggy, then the sailing race will be held". "If the sailing race is held, then the trophy will be awarded," and "The trophy was not awarded" imply the conclusion "It rained."	8	K3	CO1
			(OR)			
	b)	i.	Using rules of inference determine the validity of the following premises: "If I keep the lamp burning, then I can study hard. If either I do not keep the lamp burning or I go to bed early, then I shall fail. I cannot study hard. Therefore I shall not keep the lamp burning and shall fail.	8	K3	CO1
		ii.	Make use of logical equivalences, determine whether $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$ is a tautology or not. Prove or disprove.	8	K3	CO1
12.	a)	i.	Show that $\forall x(P(x) \rightarrow \exists x\, P(x)$ is a logically valid statement.	6	K2	CO2
		ii.	Justify and check for the logical equivalence of the quantified statement: $\forall x(p(x) \vee q(x)) \equiv \forall x p(x) \vee \forall x q(x)$.	10	K5	CO2
			(OR)			
	b)	i.	Outline and find the validity of the following arguments by using rules of inference. $\forall x(p(x) \rightarrow r(x)), \neg r(y) \Rightarrow \neg p(y)$	8	K2	CO2
		ii.	Prove or disprove the validity of the argument using rules of inference: "Every living thing is a plant or an animal". "David's dog is alive and it is not a plant". "All animals have hearts". Hence, "David's dog has a heart".	8	K5	CO2

13.	a)	i.	Let R and S be relations on a set $A = \{1, 2, 3\}$ with relation matrices $M_R = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 0 \end{bmatrix}$ *and* $M_S = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 0 \\ 0 & 1 & 0 \end{bmatrix}$. Illustrate the graphical representation of these relations and find the matrices of the following relations: 1) $R \cup S$ 2) $R \cap S$ 3) R^{-1} 4) $S \circ R$	8	K2	CO3
		ii.	Show that the relation "Congruence modulo 3" defined by $R = \{(x, y) \mid x - y \ is \ divisible \ by \ 3\}$ is an equivalence relation over the set of integers. What are the equivalence classes of R?	8	K2	CO3
			(OR)			
	b)	i.	Draw a Hasse diagram for the poset $(\{2, 4, 5, 10, 12, 20, 25\}, /)$. Which elements of the poset are maximal and minimal? Discuss in detail.	6	K2	CO3
		ii.	Interpret whether the posets with these Hasse diagrams are lattices. Also check whether it is a distributive lattice. (I) (II) (III) 	10	K2	CO3
14.	a)	i.	Construct whether each of the following functions is a bijection from R to R. 1) $f(x) = -3x + 4$ 2) $-3x^2 + 7$ 3) $(x + 1)/(x + 2)$ 4) $f(x) = x^5 + 1$.	8	K3	CO4
		ii.	Build an explicit formula for the Fibonacci numbers $f_n = f_{n-1} + f_{n-2}$ and also satisfies the initial conditions $f_0 = 0$ and $f_1 = 1$.	8	K3	CO4

(OR)

b)	i.	Make use of generating functions to show that $\sum_{k=0}^{n} C(n,k)^2 = C(2n,n)$.	8	K3	CO4
	ii.	Make Use of generating function to solve the recurrence relation $a_k = 3a_{k-1}$ for $k = 1, 2, 3 \ldots$ with initial condition $a_0 = 2$.	8	K3	CO4
15. a)	i.	Show that Z, the set of integers forms an abelian group with respect to the operation $'*'$ defined on it as: $a * b = a + b + 1$. If $f: Z \to Z$ is a function from set of integers to itself under the same operation, Is $'f'$ homomorphic? Give explanation.	8	K2	CO5
	ii.	Determine whether the operation $'*'$ is defined on the set of real number R as follows: $a * b = \lvert a - b \rvert$ for all $a, b \in R$ is a semi group that holds commutative property. Explain in detail.	8	K5	CO5
		(OR)			
b)	i.	State and Prove Lagrange's theorem.	8	K2	CO5
	ii.	Determine whether the set $S = \{1, 3, 7, 9\}$ is an abelian group under multiplication modulo 10. Explain in detail.	8	K5	CO5

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5023

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Third Semester
Computer Science and Engineering
U19CS304 – DATA STRUCTURES
(Common to Electronics and Communication Engineering)
(Regulation 2019)

Time : Three Hours | Maximum : 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What kind of primary operations can be done on various Data Structures?	2	K2	CO1
2.	List the drawbacks of circular linked lists.	2	K1	CO1
3.	How is stack helpful in parenthesis matching?	2	K3	CO2
4.	Mention few the applications of priority queues.	2	K2	CO2
5.	Provide an example of AVL tree.	2	K1	CO3
6.	Write a C code to print the height of a given binary tree.	2	K3	CO3
7.	Explicate the various representations of graphs?	2	K1	CO4
8.	Provide real time applications of spanning trees.	2	K2	CO4
9.	Derive the best case time complexity of insertion sort.	2	K4	CO5
10.	In computing, how the hash tables would be useful?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q. No.	Questions	Marks	KL	CO
11. a)	Write a C function to add a new element X after a given element Y in a doubly linked list.	13	K3	CO1

(OR)

	b)	Write an algorithm for deleting an element X from a circular linked list.	13	K3	CO1
12.	a)	What is a Queue? How is it different from the stack, and how is it implemented?	13	K2	CO2
		(OR)			
	b)	Write an algorithm for extracting the highest priority element from a given priority queue.	13	K3	CO2
13.	a)	Write a recursive algorithm for the in-order traversal of a binary tree. Explain the method with the help of an example.	13	K3	CO4
		(OR)			
	b)	Discuss any one application of binary tree data structure in detail.	13	K2	CO4
14.	a)	Explain the working of Prim's algorithm with the help of a suitable example.	13	K3	CO4
		(OR)			
	b)	Write an algorithm for topological sorting of a given Directed Acyclic Graph.	13	K5	CO4
15.	a)	Derive the best case and worst case time complexities of the Quick Sort algorithm.	13	K4	CO5
		(OR)			
	b)	What are the different Collision Resolution Techniques in hashing? Briefly explain them.	13	K3	CO3

PART – C

(1 x 15 = 15 Marks)

Q. No.		Questions	Marks	KL	CO
16.	a)	Write a program in C to find the median of N elements stored in an unsorted array A [ ]. Also, comment on the time complexity.	15	K6	CO4
		(OR)			
	b)	Illustrate the stack implementation using queue data structure (code/ pseudo code required). Write the complexities of Push () and Pop() operations as well.	15	K6	CO5

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5028

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Third Semester
Computer Science and Engineering
U19CS306 – DIGITAL LOGIC DESIGN
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Find the value of x and y i. $(211)_x = (152)_8$ ii. $(AC.2)_{16} = (y)_2$	2	K3	CO1
2.	Show that if xy =0, then x XOR y = x + y	2	K2	CO1
3.	Define Minterm.	2	K1	CO2
4.	Reduce F = Σ (0, 1, 4, 6) + d (2) using karnaugh map.	2	K3	CO2
5.	The memory unit 2K X 16 is specified by the number of words times the number of bits per word. How many address lines and input-output data lines are needed in each case?	2	K3	CO3
6.	What is an encoder?	2	K1	CO3
7.	What are shift registers?	2	K1	CO4
8.	Assume that a five-bit binary counter starts in the 00000 state. What will be the count after 144 input pulses?	2	K3	CO4
9.	Define Flow table.	2	K1	CO5
10.	Write the state reduction algorithm.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	What are the properties of switching functions?	3	K1	CO1
		ii.	Implement the Boolean function of Q = A(B+C) using switches. Also show the equivalent digital logic circuit.	10	K3	
			(OR)			
	b)		Construct the truth table and determine the Boolean functions for outputs F and G as a function of four inputs A, B, C, and D in Fig.1.	13	K3	CO1

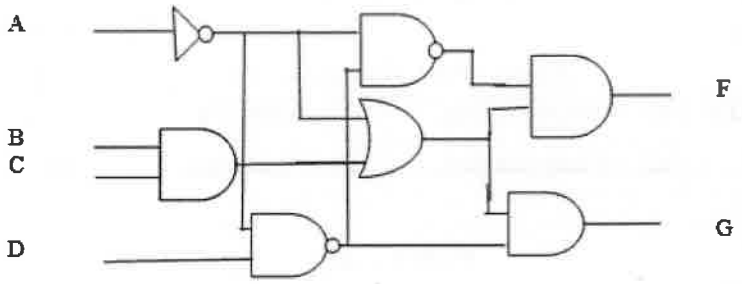

Fig. 1

12.	a)		Explain the Quine-McCluskey algorithm for finding prime implicant with neat examples.	13	K2	CO2
			(OR)			
	b)		Given the following Boolean function, F = xy'z + x'y'z + w'xy + wx'y + wxy		K3	CO2
		i.	Draw a corresponding Karnaugh map of the function	3		
		ii.	Give minterm and maxterm expressions	3		
		iii.	Write in POS and SOP forms	3		
		iv.	Simplify the function and implement it by NAND gates only.	4		
13.	a)		Implement the following functions using PLA. A (x, y, z) = ∑m (1, 2, 4, 6) B (x, y, z) = ∑m (0, 1, 6, 7) C (x, y, z) = ∑m (2, 6)	13	K3	CO3
			(OR)			
	b)		Design a code converter that converts a decimal digit from "8 -4 -2 -1" code to BCD.	13	K3	CO3
14.	a)		A Gray code is a sequence of codes which differ in one-bit position at each step. For example, 00, 01, 11, 10, 00, ... is a two-bit Gray code. Design a counter using JK-flipflops to produce a three-bit Gray code.	13	K3	CO4
			(OR)			

	b)	Show how			
		i. A JK flip flop is converted to a T flip flop	7	K2	CO4
		ii. A D flip flop is converted to a T flip flop	6		
15.	a)	Elaborate on analysis and design of asynchronous sequential circuits.	13	K1	CO5
		(OR)			
	b)	Explain the design of Hazard Free Switching circuits in detail.	13	K1	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	A sequential circuit has two JK flip-flops, A and B: two inputs, x and y; and one output, z. The flip- flop input functions and the circuit output function are as follows:		K3	CO5
		$JA = Bx + B y$ $\quad KA = B x y,$			
		$JB = A x$ $\quad KB = A + x y$			
		$z = Axy + B x y$	5		
		i. Draw the logic diagram of the circuit.	5		
		ii. Obtain the state table.	5		
		iii. Derive the next state equations for A and B.			
		(OR)			
	b)	Fig. 2 shows four switches that are part of control circuitry in a copy machine. The switches are at various points along the path of the copy paper as the paper passes through the machine. Each switch is normally open and as the paper passes over a switch the switch closes. It is impossible for switches SW1 and SW4 to be closed at the same time. Design the logic circuit to produce a high output whenever two or more switches are closed at the same time. Use K-mapping and take advantage of the don't care conditions.	15	K6	CO2

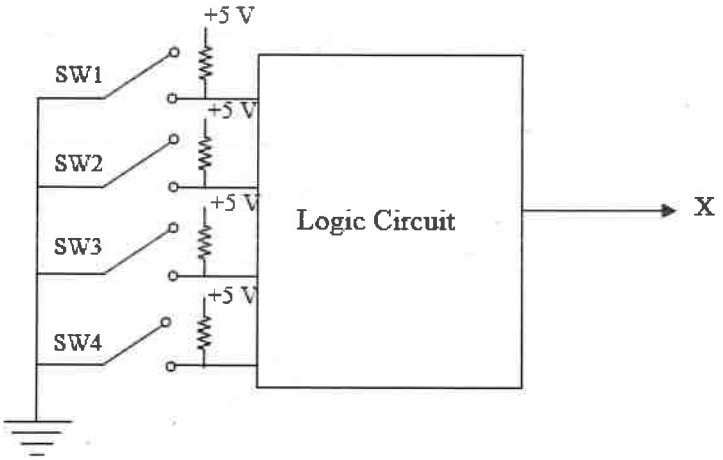

Fig. 2

Reg.No.:								

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5031

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JUNE 2023
Third Semester
Computer Science and Engineering
U19CS307 – OBJECT ORIENTED PROGRAMMING
(Common to Computer Science and Technology)
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 – Evaluating
	K2 – Understanding	K4 – Analyzing	K6 – Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What is the difference between Abstraction and Encapsulation?	2	K1	CO1
2.	What do you understand by pure object-oriented language? Why Java is not a pure object-oriented programming language?	2	K1	CO1
3.	Why Multiple Inheritance Is Not Supported by Java?	2	K1	CO2
4.	Predict what would happen if both superclass and subclass have a field with the same name?	2	K3	CO2
5.	Why do we need Event Handling in Java?	2	K1	CO3
6.	What would result when an exception is thrown by the main method?	2	K3	CO3
7.	State whether we can make the user thread as daemon thread after the thread is started.	2	K2	CO4
8.	State multithreading and how it is different from multitasking?	2	K2	CO4
9.	Differentiate between Java AWT and Java Swing.	2	K4	CO5
10.	Indicate the relationship between an event listener interface and an event adapter classes.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.			Questions	Marks	KL	CO
11.	a)	i.	Why do we need to use Object Oriented Programming?	5	K1	CO1
		ii.	What are the main features and limitations of OOP?	8		
			(OR)			
	b)	i.	How does procedural programming differ from object-oriented programming?	8	K4	CO1
		ii.	What are the differences between the constructor and the method in Java?	5		
12.	a)	i.	Explain Java guidelines for overloading a method.	7	K2	CO2
		ii.	Explain what is meant by Java's method overriding?	6		
			(OR)			
	b)		Differentiate between the following:			
		i.	Multiple inheritance and Multilevel inheritance.	6.5	K4	CO2
		ii.	Hierarchical inheritance and Hybrid inheritance.	6.5		
13.	a)		Why do you think Checked Exception exists in Java since we can also convey error using Runtime Exception? Explain.	13	K3	CO3
			(OR)			
	b)		What are the best practices to be followed while doing Exception handling in Java? Explain.	13	K5	CO3
14.	a)		Explain the different states in a thread lifecycle.	13	K2	CO4
			(OR)			
	b)		Which one is better to implement thread in Java: extending Thread class or implementing Runnable? Defend your answer.	13	K5	CO4
15.	a)		What is event handling in java? Formulate the available event classes and listener interfaces with suitable examples.	3 10	K6	CO5
			(OR)			
	b)		Explain the various swing components with examples.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.			Questions	Marks	KL	CO
16.	a)		Write a code to avoid deadlock in Java where N threads are accessing N shared resources.	15	K6	CO4
			(OR)			
	b)	i.	Why do we call the start () method which in turn calls the run () method, why not we directly call the run () method?	8	K3	CO4
		ii.	You have threads T1, T2, and T3; how will you ensure that thread T2 runs after T1 and thread T3 runs after T2?	7		