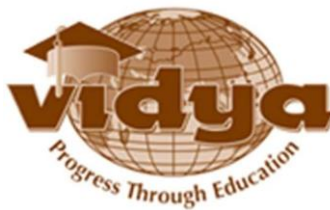


S5 CSE QUESTION BANK

COMPUTER SCIENCE & ENGINEERING



**VIDYA ACADEMY OF SCIENCE AND TECHNOLOGY TECHNICAL CAMPUS
KILIMANOOR**

(A unit of Vidya International Charitable Trust)

Accredited by NAAC with "B++" grade

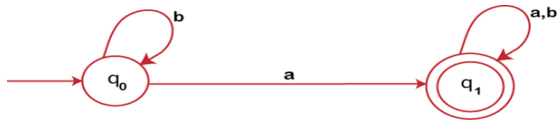
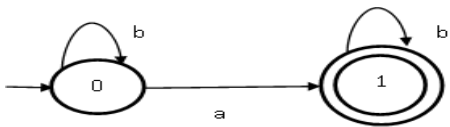
Index

Code	Subject
CST 301	Formal Languages and Automata Theory
CST 303	Computer Networks
CST 305	System Software
CST 307	Microprocessors and Micro Controllers
CST 309	Management of Software Systems
MNC 301	Disater management

CST301 FORMAL LANGUAGES AND AUTOMATA THEORY

MODULE 1

Sl. No	Questions	Marks	KTU/KU Month/Year
1	Construct a DFA for strings in which first and last letters do not match. $\Sigma = \{a, b\}$	3	DEC 22,23
2	Prove that, if L is accepted by an ordinary NFA, there exist an equivalent ϵ -NFA that also accepts L	7	DEC 22,20
3	Design an NFA (without ϵ -moves) for strings having substring 'bab'. Convert it into equivalent DFA. $\Sigma = \{a, b\}$	7	DEC 22
4	Construct an ϵ -NFA for the language $L = \{0^n 1^m 2^p / n, m, p \geq 0\}$ and convert it into equivalent NFA without ϵ -transitions	7	DEC 22
5	Draw the state transition diagram showing a DFA for recognizing the language L over the alphabet set $\Sigma = \{a, b\}$: $L = \{x \mid x \in \Sigma^* \text{ and the number of a in } x \text{ is divisible by 2 or 3}\}.$	3	DEC 21
6	Write a Regular Grammar G for the language: $L = \{0^n 1^m : n, m \geq 1\}$	3	DEC 21
7	Draw the state-transition diagram showing a DFA for recognizing the language: $L = \{x \in \{a,b\}^* \mid \text{every block of five consecutive symbols in } x \text{ contains two consecutive a's}\}.$	6	DEC 21
8	Draw the state-transition diagram showing an NFA N for the following language L. Obtain the DFA D equivalent to N by applying the subset construction algorithm. $L = \{x \in \{a, b\}^* \mid x \text{ contains 'bab' as a substring}\}$	8	DEC 21,23
9	Define Regular Grammar and write Regular Grammar G for the following language : $L = \{x \in \{a, b\}^* \mid x \text{ does not ends with 'bb'}\}$	7	DEC 21
10	Draw transition diagram for NFA (without ϵ -moves) for strings starting with '10' or '11'. $\Sigma = \{0,1\}$.	3	DEC 2023
11	Design a DFA for strings in which number of a's is multiple of 3 and number of b's is multiple of 2. $\Sigma = \{a, b\}$	6	DEC 2023
12	Construct a regular grammar for $L = \{0^n 11 \mid n \geq 1\}$. Construct deterministic finite automata for the same	7	DEC 2023

MODULE 2																								
Sl. No	Questions	Mark s	KTU/KU Month/Year																					
1	Generate regular expression for strings in which number of a's is a multiple of three. $\Sigma = \{a, b\}$	3	DEC 22																					
2	Develop equivalent automata for the Regular Expression $(a+b)^* aabb(a^*+bb)^*$	7	DEC 22																					
3	Prove that for every Regular Expression ' R ', there is an ϵ -NFA ' M '	7	DEC 22																					
4	List out the rules for writing regular expressions. Convert the following DFA to its equivalent Regular Expression 	7	DEC 22																					
5	Construct an ϵ -NFA for the regular expression $(a+b)^* ab(a+b)^*$	3	DEC 21																					
6	Find the equivalent Regular Expression using Kleene's construction for the language represented by the following DFA. 	8	DEC 21,23																					
7	Using pumping lemma for Regular Languages, prove that the language $L = \{0^n \mid n \text{ is a perfect square}\}$ is not Regular.	7	DEC 21																					
8	Obtain the minimum state DFA for the following DFA. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>a</th> <th>b</th> </tr> </thead> <tbody> <tr> <th>0</th> <td>1</td> <td>2</td> </tr> <tr> <th>1</th> <td>4</td> <td>5</td> </tr> <tr> <th>2</th> <td>0</td> <td>3</td> </tr> <tr> <th>3</th> <td>5</td> <td>2</td> </tr> <tr> <th>4</th> <td>1</td> <td>0</td> </tr> <tr> <th>5</th> <td>4</td> <td>3</td> </tr> </tbody> </table>		a	b	0	1	2	1	4	5	2	0	3	3	5	2	4	1	0	5	4	3	7	DEC 21
	a	b																						
0	1	2																						
1	4	5																						
2	0	3																						
3	5	2																						
4	1	0																						
5	4	3																						

9	Give a regular expression for the set of all strings not containing 101 as a substring	3	SEP 20
10	State pumping lemma for regular languages. Prove that the language $L = \{a^{n^2} \mid n > 0\}$ is not regular.	5	SEP 20
11	Give a regular expression for the set of all strings not containing 101 as a Substring	3	DEC 23
12	Develop equivalent automata for the R.E. $(ab + b)^*(a+bb)^*a^*$.	7	DEC 2023

MODULE 3			
Sl no	Questions	Marks	KTU/KU Month/Year
1	With suitable example, explain about ambiguous grammar	3	DEC 22
2	State Myhill - Nerode Theorem	3	DEC 22
3	What is Greibach Normal Form (GNF)? Convert the following CFG to GNF $S \rightarrow AA / a, \quad A \rightarrow SS / b$	7	DEC 22
4	Design CFG for the following languages (i) Palindromes over $\{a, b\}$ (ii) Stings with more than 2 zeros. $\Sigma = \{0, 1\}$ (iii) $(0+1)^*(01)^*(0+1)^*$	7	DEC 22
5	What is Chomsky Normal Form (CNF)? Convert the following productions to CNF. $S \rightarrow aSa / bSb / SS / \epsilon$	7	DEC 22,23
6	Write a Context-Free Grammar for the language $L = \{wcw^r \mid w \in \{a,b\}^*\}$, w^r represents the reverse of w .	3	DEC 21

7	<p>Consider the following productions:</p> $S \rightarrow aB \mid bA$ $A \rightarrow aS \mid bAA \mid a$ $B \rightarrow bS \mid aBB \mid b$ <p>For the string 'baaabbbba' find</p> <ol style="list-style-type: none"> The leftmost derivation The rightmost derivation The parse tree 	7	DEC 21
8	Construct the Grammars in Chomsky Normal Form generating the set of all strings over $\{a,b\}$ consisting of equal number of a's and b's.	7	DEC 21
9	Find the Greibach Normal Form for the following Context Free Grammar $S \rightarrow XA \mid BB$, $B \rightarrow b \mid SB$, $X \rightarrow b$, $A \rightarrow a$	7	DEC 21
10	Convert the Context-Free Grammar with productions: $\{S \rightarrow aSb \mid \epsilon\}$ into Greibach Normal form	7	DEC 2023
11	Convert the grammar $\{S \rightarrow AaCb \mid ABa, A \rightarrow bAa \mid a, B \rightarrow BaB \mid b, C \rightarrow c\}$ to CNF	7	DEC 2023
12	Write CFG equivalent to the regular expression $0^*1(0+1)^*+1$	3	DEC 2023

MODULE 4			
Sl no	Questions	Marks	KTU/KU Month/Year
1	Whether DPDA and NPDA are equivalent? Justify your answer	3	DEC 22
2	Prove that for every PDA accepted by final state, there exists an equivalent PDA accepted by empty stack.	7	DEC 22
3	Design PDA for set of even length palindromes over $\{a, b\}$. Illustrate the working with suitable example	7	DEC 22

4	Design PDA for $L = \{x \in \{a, b\}^* / \#a(x) = \#b(x)\}$. Here $\#p(x)$ represents the number of occurrences of the symbol p in the string x	7	DEC 22
5	Using pumping lemma for CFLs, show that $L = \{ww / w \in \{a, b\}^*\}$ is not context free.	7	DEC 22
6	Write the transition functions of PDA with acceptance by Final State for the language $L = \{a^n b^n : n \geq 0\}$.	3	DEC 21
7	Design a PDA for the language $L = \{ww^r \mid w \in \{a,b\}^*\}$. Also illustrate the computation of the PDA on the string 'aabbaa'.	7	DEC 21
8	Construct a CFG to generate $L(M)$ where $M = (\{p, q\}, \{0, 1\}, \{X, Z_0\}, \delta, q, Z_0, \emptyset)$ where δ is defined as follows: $\delta(q, 0, Z_0) = (q, XZ_0)$ $\delta(q, 0, X) = (q, XX)$ $\delta(q, 1, X) = (p, \epsilon)$ $\delta(p, 1, X) = (p, \epsilon)$ $\delta(p, \epsilon, X) = (p, \epsilon)$ $\delta(p, \epsilon, Z_0) = (p, \epsilon)$	7	DEC 21
9	Using pumping lemma for Context free languages, prove that the language $L = \{a^n b^n c^n \mid n \geq 1\}$.	7	DEC 21
10	Prove that CFLs are closed under Union, Concatenation and Homomorphism.	7	DEC 21
11	Design a PDA for strings in which number of a's is less than number of b's.	7	DEC 2023
12	Using Pumping lemma prove the given language is not context free. $L = \{anb^2nc^n \mid n \geq 1\}$.	7	DEC 2023

MODULE 5			
Sl no	Questions	Mar ks	KTU/KU Month/Year
1	Differentiate between Recursive and Recursively Enumerable languages	3	DEC 22
2	Design TM for $L = \{ a^n b^m a^n \mid m, n > 0 \}$. Illustrate the working with suitable example	7	DEC 22
3	Explain Chomsky hierarchy for formal languages and evaluate various types	7	DEC 22
4	Prove that TM halting problem is undecidable	7	DEC 22
5	Write the formal definition of Context Sensitive Grammar and write the CSG for the language $L = \{ a^n b^n c^n \mid n \geq 1 \}$.	3	DEC 21
6	Design Linear Bounded Automata for the language $L = \{ a^n b^n c^n \mid n \geq 1 \}$.	7	DEC 21
7	Design a Turing Machine for the language $L = \{ a^n b^{2n} \mid n \geq 1 \}$. Illustrate the computation of TM on the input 'aaabbbbb'.	7	DEC 21
8	Design a TM to compute the 2's complement of a binary string.	5	SEP 20
9	Define a Universal Turing Machine (UTM). With the help of suitable arguments show the simulation of other Turing machines by a UTM.	6	SEP 20
10	Design a TM to find the sum of two numbers m and n. Assume that initially the tape contains m number of 0s followed by # followed by n number of 0s	7	DEC 2023
11	Design a TM to find the 1's complement of a binary number.	3	DEC 2023
12	Differentiate Recursive and Recursively Enumerable Languages.	3	DEC 2023

CST303 - COMPUTER NETWORKS

MODULE 1

Sl. No.	Questions	Marks	Month/Year
1	Define simplex, half duplex and full duplex transmission mode. Give one example for each.	3	JUNE 24 DEC 18 DEC21
2	How computer networks are categorized based on scale? Explain the features of each network.	8	DEC 23
3	Differentiate between Manchester encoding and Differential Manchester encoding with suitable example.	6	DEC 23
4	Explain the various physical topologies with neat sketch	10	DEC 23
5	Define bandwidth-delay product with example.	3	DEC 23
6	Differentiate between connection-oriented and connection-less services	3	DEC -23
7	Explain the various performance indicators used in communication	3	DEC 23 DEC 17 APR 18
8	Describe the ISO/OSI layered architecture with the help of a neat diagram.	7	DEC 23, APR 18 DEC 21
9	Write the functions of data link and network layer of OSI reference model	10	JUNE 24, DEC23, APR 18
10	What is the transmission time of a packet sent by a station if the length of the packets 1 million bytes and the bandwidth of the channel is 200 Kbps?	4	DEC 21
11	Compare Twisted Pair, Coaxial Cable and Optical Fibre guided transmission media	5	MAY19 DEC 20 DEC 21
12	What are the OSI service primitives for connection oriented service?	3	APR21
MODULE -II			
1	Draw the frame format of Ethernet	3	JUN24
2	Generate the CRC code for the data word of 110010101.The divisor is 10101	3	JUN24
3	Explain the various framing methods used in data link layer	3	DEC 23

4	Which are the different types of errors? Explain with examples.	3	DEC 23
5	A bit stream 10011101 is transmitted using the CRC method. The generator polynomial is $x^3 + 1$. Show the actual bit string transmitted.	9	DEC 21
6	Differentiate between I-persistent and p-persistent CSMA.	9	DEC 23
7	Draw and explain IEEE 802.11 Wireless LAN frame structure	3	JUN24 DEC 21
8	Assuming even parity, find the parity bit for each of the following data: i. 1011010 ii. 0000000 iii. 10010001	9	DEC23
9	How collision is avoided in CSMA/CA? Describe the different strategies used for this	4	DEC21
10	Explain the concept of Sliding window protocols. Differentiate between the working of One-bit sliding window, Selective repeat and Go-back- N bidirectional protocols	3	DEC21
11	How collision is avoided in CSMA/CA? Describe the different strategies used for this. .	14	DEC20
12	How does Multiple Access with Collision Avoidance solve the hidden node problem and exposed node problem in Wireless LANs? .	14	DEC20
MODULE -III			
1	Explain link state routing algorithm with an example	10	JUN24
2	Explain how shortest path is performed with an example	8	JUN24
3	Explain the techniques for achieving good QoS	6	JUN24
4	Explain distance vector routing algorithm with an example	8	DEC 23
5	Write notes on load shedding	4	DEC 23
6	Explain any three closed loop congestion control techniques	7	DEC 23
7	Illustrate the packet routing process of mobile hosts	6	MAY 19 DEC 21
8	Explain how routing is performed using link state algorithm. Illustrate with an example..	7	Dec 23
9	Explain any three closed loop congestion control techniques	7	Dec 23
10	Explain the steps involved in Multicast routing	6	Dec 23
MODULE IV			
1	Explain OSPF routing algorithm	7	JUN24
2	Draw and explain BOOTP message format	7	JUN24
3	What is the use of ARP? Explain ARP operation and packet format	8	JUN24

4	How do you subnet the Class C IP address 195.1.1.0 so as to have 10 subnets with a maximum of 12 hosts in each subnet	3	DEC21
5	A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle?	3	DEC21 JUN 24
6	Describe the features of BGP. How does BGP avoid count to infinity problem	3	DEC 23
7	Draw and explain BOOTP message format.	9	DEC 23
8	What is meant by exterior gateway routing protocol? Explain the working of BGP?	5	DEC18 DEC21,
9	What is the function of ARP? Explain its working	5	DEC18, DEC19 DEC21
10	Describe stub networks, multi-connected networks and transit networks	5	DEC 20, DEC 21
11	Differentiate between BOOTP and DHCP	5	DEC 21
12	What is internet multicasting? What is IGMP? Explain any three IGMP messages	6	DEC17 DEC19. DEC21
MODULE V			
1	How recursive query resolution is performed in DNS?	3	DEC 23
2	Explain the working of TCP.	7	JUNE24
3	List the transport service primitives.	7	DEC 23
4	How does FTP handle file transfer operation?	7	JUN24, DEC23 DEC181
5	Describe the working of electronic mail system.	8	DEC 23
6	Explain SNMP basic components and their functions. Describe the basic commands used in SNMP	7	DEC 17 DEC 21
7	What is DNS? Explain resource record and name server. Illustrate DNS working.	7	DEC 21 DEC20
8	What is the significance of circular sending and receiving buffers in TCP? How are they used?.	3	DEC 21
9	Write notes on MIME	5,6	DEC 17 MAY 19
10	Describe the name-address resolution techniques used in DNS	5	DEC 21
11	What is TCP? Draw and explain TCP segment header. Explain TCP connection establishment process	4	DEC23 DEC17 DEC 21
12	Describe the operation and packet format of UDP	5	DEC17 JUN24

CST 305 SYSTEM SOFTWARE

MODULE 1			
Sl. No	Questions	Marks	KTU/KU
1	Write a subroutine for SIC/XE that will read a record into a buffer. The record may be any length from 1 to 100 bytes. The end of record is marked with “null” character (ASCII code 00). The subroutine should place the length of record into a variable named LENGTH. Use immediate addressing and register –to –register instructions to make the process efficient as possible.	4	APR 18
2	Write a sequence of instructions for SIC to set $ALPHA = BETA * 9 + GAMMA$	3	DEC 18 DEC 21
3	List out the various registers used in SIC along with their purpose	3	DEC 18 DEC 22
4	Explain any three addressing modes in SIC/XE.	3	JUN 24
5	What are the functions of operating systems	3	DEC 18 JUN 24
6	Compare the following with reference to SIC and SIC/XE machines: i. Memory ii. Instruction format	4	SEP 20 DEC 21
7	Suppose RECORD contains a 100-byte record. Write a subroutine for SIC that will write this record onto device 05.	5	DEC 20
8	Explain the different I/O instructions in SIC.	3	DEC 21
9	Illustrate the roles and functions of Operating System, Assembler, Compiler and Linker in a modern computer system.	8	DEC 21
10	Describe the use of n,i,x,b,p and e bits in the SIC/XE instruction format. Write the binary combination for these bits such that the resultant target address would be as below and also state what would be the addressing modes for each. i. (PC) + disp ii. (B) + disp iii. (PC) + disp + (X) iv. (B) + disp + (X)	8	DEC 21 DEC 23
11	Distinguish between interpreter and compiler.	3	DEC 22
12	List and explain any three system softwares.	6	DEC 23

CST 305 SYSTEM SOFTWARE

MODULE 2																		
1	What is meant by forward reference? How is it resolved by two pass assembler.	3	DEC18, MAY19, DEC 21															
2	Describe data structures used in the two pass SIC assembler program Give algorithm for pass 1 of a two pass SIC assembler	3	DEC 17 DEC 21 DEC 22 DEC 23															
3	With suitable examples, how the different instruction formats and addressing modes of SIC/XE are handled during assembling	5	DEC 17 JUN 24															
4	With the aid of an explain the second pass of a two pass algorithm	6	MAY 19 DEC 23															
5	<p>Consider the statements in SIC program. Consider the program being assembled using a 2 pass assembler.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 15%;">Line no</th> <th style="width: 20%;">Location</th> <th style="width: 15%;">Label</th> <th style="width: 15%;">Opcode</th> <th style="width: 35%;">Operand</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">LENGTH</td> <td style="text-align: center;">RESW</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">20</td> <td style="text-align: center;">-----</td> <td style="text-align: center;">NEW</td> <td style="text-align: center;">WORD</td> <td style="text-align: center;">3</td> </tr> </tbody> </table> <p>What will be the address value assigned to the symbol NEW during pass 1?</p>	Line no	Location	Label	Opcode	Operand	10	1000	LENGTH	RESW	4	20	-----	NEW	WORD	3	3	SEP 20
Line no	Location	Label	Opcode	Operand														
10	1000	LENGTH	RESW	4														
20	-----	NEW	WORD	3														
6	<p>Suppose the address associated with the symbol RETADR is 0030 and the machine equivalent code for STL is 14. Assemble the given SIC/XE instruction, by clearly indicating the instruction format, addressing mode and the setting of different flag bits, given the address value assigned to RETADR is 0030.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 25%;">Location</th> <th style="width: 25%;">Label</th> <th style="width: 25%;">Opcode</th> <th style="width: 25%;">Operand</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0000</td> <td style="text-align: center;">FIRST</td> <td style="text-align: center;">STL</td> <td style="text-align: center;">RETA DR</td> </tr> </tbody> </table>	Location	Label	Opcode	Operand	0000	FIRST	STL	RETA DR	5	SEP 20							
Location	Label	Opcode	Operand															
0000	FIRST	STL	RETA DR															

CST 305 SYSTEM SOFTWARE

7	What is a relocatable program? Do all instructions of SIC/XE machine program need modification because of relocation? Justify your answer	4	DEC 20
8	Give the structure and purpose of Modification record and Define record.	3	DEC 21 DEC22
9	Write a SIC program to perform linear search in an array of 100 elements.	6	DEC 21
10	<p>Generate the assembled object program for the below SIC program. The machine code for the instructions used are: LDX – 04, LDA – 00, ADD – 18, TIX – 2C, STA – 0C, JLT – 38 and RSUB – 4C. Show the location counter value for each instruction</p> <pre style="margin-left: 40px;"> SUM START 4000 FIRST LDX ZERO LDA ZERO LOOP ADD TABLE, X TIX COUNT JLT LOOP STA TOTAL RSUB TABLE RESW 2000 COUNT RESW 1 ZERO WORD 0 TOTAL RESW 1 END FIRST </pre>	6	DEC 21
11	Write a sequence of instructions for SIC/XE to divide BETA by GAMMA, setting ALPHA to the integer portion of the quotient and DELTA to the remainder. Use register to-register instructions to make the calculation as efficient as possible.	5	DEC 22
12	Write a SIC program for doing the following arithmetic operations: BETA = ALPHA + INCR – 1 DELTA = GAMMA + INCR – 1	6	DEC 23
MODULE 3			
1	Write notes on multi pass assembler with example	5	APR18, DEC17 DEC 23 JUN 24

CST 305 SYSTEM SOFTWARE

2	Distinguish between program blocks and control section How the assembler handles multiple program blocks	9	DEC 18 DEC 21 DEC 22 DEC 23																																																																								
3	Write notes on MASM assemblers	3	DEC 17 DEC 22																																																																								
4	Distinguish between Program blocks and control section. How does the assembler handle multiple program blocks?	8	DEC18 SEP 20 DEC 21 DEC 23																																																																								
5	List out the basic functions of assemblers with proper examples	4	APR 18																																																																								
6	Explain two passes of assembler algorithm with proper example	9	APR 18																																																																								
7	With the help of an example explain how to find target address during assembling in each case	6	DEC 18																																																																								
8	Give the format and purpose of the different record types present in an object program that uses multiple control sections.	4	SEP 20																																																																								
9	Develop the records (excluding header, text and end records) for the following control section named COPY	5	SEP 20																																																																								
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Loc</th> <th colspan="3" style="text-align: left;">Source Statement</th> </tr> </thead> <tbody> <tr> <td>0000</td> <td>COPY</td> <td>START</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>EXTDEF</td> <td>BUFFER, BUFFEND, LENGTH</td> </tr> <tr> <td></td> <td></td> <td>EXTREF</td> <td>RDREC, WRREC</td> </tr> <tr> <td>0000</td> <td>FIRST</td> <td>STL</td> <td>RETADR</td> </tr> <tr> <td>0003</td> <td>CLOOP</td> <td>+JSUB</td> <td>RDREC</td> </tr> <tr> <td>0007</td> <td></td> <td>LDA</td> <td>LENGTH</td> </tr> <tr> <td colspan="4" style="height: 20px;"> </td> </tr> <tr> <td>000A</td> <td></td> <td>COMP</td> <td>#0</td> </tr> <tr> <td>000D</td> <td></td> <td>JEQ</td> <td>ENDFIL</td> </tr> <tr> <td>0010</td> <td></td> <td>+JSUB</td> <td>WRREC</td> </tr> <tr> <td>0014</td> <td></td> <td>J</td> <td>CLOOP</td> </tr> <tr> <td>0017</td> <td>ENDFIL</td> <td>LDA</td> <td>=C 'EOF'</td> </tr> <tr> <td>001A</td> <td></td> <td>STA</td> <td>BUFFER</td> </tr> <tr> <td>001D</td> <td></td> <td>LDA</td> <td>#3</td> </tr> <tr> <td>0020</td> <td></td> <td>STA</td> <td>LENGTH</td> </tr> <tr> <td>0023</td> <td></td> <td>+JSUB</td> <td>WRREC</td> </tr> <tr> <td>0027</td> <td></td> <td>J</td> <td>@RETADR</td> </tr> </tbody> </table>	Loc	Source Statement			0000	COPY	START	0			EXTDEF	BUFFER, BUFFEND, LENGTH			EXTREF	RDREC, WRREC	0000	FIRST	STL	RETADR	0003	CLOOP	+JSUB	RDREC	0007		LDA	LENGTH					000A		COMP	#0	000D		JEQ	ENDFIL	0010		+JSUB	WRREC	0014		J	CLOOP	0017	ENDFIL	LDA	=C 'EOF'	001A		STA	BUFFER	001D		LDA	#3	0020		STA	LENGTH	0023		+JSUB	WRREC	0027		J	@RETADR		
Loc	Source Statement																																																																										
0000	COPY	START	0																																																																								
		EXTDEF	BUFFER, BUFFEND, LENGTH																																																																								
		EXTREF	RDREC, WRREC																																																																								
0000	FIRST	STL	RETADR																																																																								
0003	CLOOP	+JSUB	RDREC																																																																								
0007		LDA	LENGTH																																																																								
000A		COMP	#0																																																																								
000D		JEQ	ENDFIL																																																																								
0010		+JSUB	WRREC																																																																								
0014		J	CLOOP																																																																								
0017	ENDFIL	LDA	=C 'EOF'																																																																								
001A		STA	BUFFER																																																																								
001D		LDA	#3																																																																								
0020		STA	LENGTH																																																																								
0023		+JSUB	WRREC																																																																								
0027		J	@RETADR																																																																								

CST 305 SYSTEM SOFTWARE

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 10%;">002A</td> <td style="width: 20%;">RETADR</td> <td style="width: 20%;">RESW</td> <td style="width: 10%;">1</td> </tr> <tr> <td>002D</td> <td>LENGTH</td> <td>RESW</td> <td>1</td> </tr> <tr> <td></td> <td></td> <td>LTORG</td> <td></td> </tr> <tr> <td>0030</td> <td>*</td> <td>=C 'EOF'</td> <td></td> </tr> <tr> <td>0033</td> <td>BUFFER</td> <td>RESB</td> <td>4096</td> </tr> <tr> <td>1033</td> <td>BUFEND</td> <td>EQU</td> <td>*</td> </tr> <tr> <td>1000</td> <td>MAXLEN</td> <td>EQU</td> <td>BUFEND-BUFFER</td> </tr> </tbody> </table>	002A	RETADR	RESW	1	002D	LENGTH	RESW	1			LTORG		0030	*	=C 'EOF'		0033	BUFFER	RESB	4096	1033	BUFEND	EQU	*	1000	MAXLEN	EQU	BUFEND-BUFFER		
002A	RETADR	RESW	1																												
002D	LENGTH	RESW	1																												
		LTORG																													
0030	*	=C 'EOF'																													
0033	BUFFER	RESB	4096																												
1033	BUFEND	EQU	*																												
1000	MAXLEN	EQU	BUFEND-BUFFER																												
10	How is a feature of an assembler categorized as machine dependent or machine independent? Support your answer with an example for each category.	3	DEC 21																												
11	<p>Employ the following code to explain the concept of multipass assembler</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 10%;">1</td> <td style="width: 20%;">A</td> <td style="width: 20%;">EQU</td> <td style="width: 10%;">B/2</td> </tr> <tr> <td>2</td> <td>B</td> <td>EQU</td> <td>C-D</td> </tr> <tr> <td>3</td> <td>E</td> <td>EQU</td> <td>D-1</td> </tr> <tr> <td>4</td> <td>D</td> <td>RESB</td> <td>4096</td> </tr> <tr> <td>5</td> <td>C</td> <td>EQU</td> <td>*</td> </tr> </tbody> </table>	1	A	EQU	B/2	2	B	EQU	C-D	3	E	EQU	D-1	4	D	RESB	4096	5	C	EQU	*	7	DEC 22								
1	A	EQU	B/2																												
2	B	EQU	C-D																												
3	E	EQU	D-1																												
4	D	RESB	4096																												
5	C	EQU	*																												
12	What is the difference between literal and immediate operand? Illustrate with example	6	JUN 24																												
MODULE 4																															
1	Give algorithm for an absolute loader	6	DEC 17 APR18 MAY 19 DEC 21 DEC22																												
2	Write notes on Dynamic linking. Explain with example	4	APR18, MAY19																												
3	Differentiate between linkage loaders and linkage editors	3	DEC 18 DEC 23																												
4	Describe the data structures used for linking loading algorithm. Give algorithm for pass1 of the linking loader	5	DEC 17 DEC 21 DEC 22 JUN 24																												
5	Explain the concept of program relocation with an example OR	4	MAY 19DEC 21																												

CST 305 SYSTEM SOFTWARE

	What is the need of relocation in assembly programs? With a small example illustrate how relocation is handled in assemblers.		
6	Write the algorithm for Pass 2 of a Linking loader	6	MAY19 DEC 21 DEC 23
7	List and explain different machine independent features of loader. Explain the working of one type of one pass Assembler	9	DEC 18 SEP 20, DEC 21
8	What is the use of bitmask in program relocation? Illustrate with example.	3	DEC 20
9	With a help of neat diagram explain what is a linkage editor?	4	DEC 20
10	Outline the need and functions of a bootstrap loader.	3	DEC 21 DEC23
11	Describe how the concepts of segments are handled in MASM assembler for 8086. Also compare near and far jump concept and its handling in MASM.	6	DEC 21
12	Describe about bootstrap loader with the help of an algorithm	8	JUN 24
MODULE 5			
1	What is meant by line-by-line macro processor? What are its advantages?	5	SEP 20
2	What is conditional macro expansion?	5	SEP 20
3	Differentiate between character and block device drivers	10	DEC17, APR18, DEC18, SEP 20, DEC 21
4	Explain the structure of text editors with the help of example and diagram	5	DEC17, MAY19 SEP 20, DEC 21 DEC 22
5	Explain various text editors .Write notes on the user interface of a text editor	5	DEC17, APR18

CST 305 SYSTEM SOFTWARE

6	What is a debugger ?Explain the different debugging methods in details	10	APR 18 JUN 24
7	Explain the various macroprocessor design options	6	JUN 24
8	Write down the situations where debugging by induction ,deduction and backtracking are used, explaining each process	10	SEP 20, DEC 21
9	With a simple diagram illustrate the communication pathway of an application program to a device through a device driver.	3	DEC 21
10	Explain the types of macro with example	8	DEC 22
11	Describe one pass macro processor algorithm and the data structures used in it	8	JUN 24 DEC 23
12	Explain any two machine independent macro processor features	8	JUN 24

CS 307 - MICROPROCESSORS AND MICROCONTROLLERS

MODULE 1

Sl. No.	Questions	Marks	Month/Year
1	List the registers used in 8086 microprocessor.	3	DEC/2017
2	Describe the functions of INTR, READY and HOLD signals.	3	DEC/2017, Jun24
3	List features of 8085 microprocessors.	3	DEC/2021
4	The value of Code Segment (CS) Register is 3054H and the value of different registers is as follows: BX: 4025H , IP: 1580H , DI: 5467H. Calculate the physical address of the next instruction to be fetched.	3	DEC/2021, 23
5	What are the flag bits available in flag register of 8086?	3	Apr/2018 DEC/2021
6	Describe maximum mode configuration of 8086	9	DEC -23
7	How does the 8086 processor access a word from an odd memory location? How many memory cycles does it take?	3	DEC/.2018
8	Find the physical address of the destination operands referred in the following instructions, if DS=0223H, DI=0CCCH and SI=1234H a) MOV [DI], AL b) MOV [SI][56H], BL	3	DEC/2018
9	Explain the physical and logical memory organization of 8086?	9	Apr/2018, Jun-24 DEC/20&23
10	Draw the Memory Read timing diagram of 8086 in Minimum mode. Describe the status of the relevant signals during each clock period.	9	DEC/2018, 2020, 2021 Jun-24
11	Give the architectural and signal differences between 8086 and 8088.	3	Apr-18, DEC/2017, 2021, 22, 23
12	Draw and explain the internal block diagram of 8086.	9	DEC/2017, 2021, 2022, 24
MODULE -II			
1	State the significance of assembler directives in an assembly language program with suitable examples.	3	DEC/2017
2	Explain the working of the following instructions with suitable example. a) IN b) SAR	3	Dec 2020
3	With the help of an example state the differences in the functioning aspects of the instructions SHR and SAR of 8086.	3	Apr. 2018
4	List the 8086 instructions used for transferring data between registers, memory, stack, and I/O devices.	3	Dec 2021

5	Write an 8086 assembly language program to check whether a string is palindrome or not. Assume that the string and its length are stored at known memory locations.	9	Apr. 2018
6	Write 8086 assembly language program to find the count of even and odd numbers from a set of 10 sixteen bit numbers stored in location starting from a known address. Store the results in two different locations.	9	DEC/ 2018
7	Define the functions of the following 8086 assembler directives: a) ASSUME b) EQU c) OFFSET ,SEGMENT	3	DEC/2018, 2020, 2021 & 23, Jun-24
8	What are the different addressing modes supported by 8086. Explain with examples.	9	DEC/2017, 2018, 2022, 23 Apr-18 Jun-24
9	Discuss about the data transfer instructions with examples.	4	DEC/2021
10	Write the functions performed by PUSH and POP instructions in 8086 with appropriate diagram.	3	DEC/2022
11	Write an assembly language program to find the total number of even and odd numbers from an array of 16-bit numbers. Assume the array contains 20 numbers and the starting location as 5500H. Draw the flowchart for the program.	14	DEC/2022
12	Write an assembly language program to find the largest and smallest number from an unordered array of 16-bit numbers. Assume the array contains 15 numbers and the starting location as 2500H. Draw the flowchart for the program.	14	DEC/2017, 2021 & 2022
MODULE -III			
1	Describe interrupt cycle of 8086/8088 with neat diagram.	3	DEC/2017, 2020 & 2022
2	Give description about maskable and non maskable interrupt.	3	DEC/2017, 2020, 22, 23
3	What is an Interrupt Vector Table (IVT)? Provide a diagrammatic representation of the IVT of 8086.	3	Apr/2018, 24 DEC/ 2018, 20, 21, 22, 23
4	With the help of a diagram explain the different blocks of 8259 Programmable Interrupt Controller.	9	Apr/2018 DEC/2018 2021 & 2022
5	Explain the stack structure of 8086.	4	DEC/21 & 23 Jun-24
6	Interface two 32K X 8 EPROMS and two 32K X 8 RAM chips with 8086, microprocessor and draw the suitable circuit showing their interfacing.	10	DEC/ 2021
7	Interface two numbers of 16Kx8 EPROM and 2 numbers of 4Kx8 RAM to 8086. Select suitable address map.	9	DEC/2020, 23
8	Interface two 4K*8 EPROMS and two 4K*8 RAM chip with 8086. Select suitable address maps.	6	DEC/2017
9	Write notes on the following based on 8086: A) software interrupt B) hardware interrupt C) nested interrupt	3	DEC/2022
MODULE 4			
1	Mention the salient features of basic I/O mode operation of and architecture of 8255.	8	DEC/2017 2020, 23,

			2021 & 2022, 23 Jun-24
2	Draw the internal architecture of 8279 and explain.	9	DEC/2017, 2020 2022
3	Describe different modes of operation of peripheral ICs:8255 and 8259.	6	DEC/2017, 2020 & 2021
4	Explain the features and architecture of DMA controller.	4	Apr.2018 Dec 2021, 23 Jun-24
5	Describe the control word format of 8255 PPI.	4	DEC/2018
6	Explain the interfacing of an IO device to 8086 using peripheral I/O method	3	Dec 2020
7	Explain the 8254 programmable timer and its operation modes with a neat block diagram	9	Dec 2021, 2022
MODULE 5			
1	With the help of a block diagram describe the different components of 8051.	10	Apr.2018, 24 Dec /2021, 23
2	What are the different addressing modes supported by 8051?	5	DEC/2017, 2020, 2021 & 2022, Jun-24
3	What is a microcontroller? Distinguish between a microcontroller and a microprocessor	5	Apr.2018, 24 Dec/2021
4	Discuss the structure of internal data memory (RAM) of 8051.	5	DEC/2018, 2020 &2021
5	What is the size of 8051 Stack Pointer (SP)? Discuss the operation of 8051 stack.	4	DEC/2018 &2022
6	Describe Internal data memory organization of 8051 microcontroller.	9	DEC/2020, 23
7	Explain PSW of 8051 microcontroller	5	DEC/2018, 2020 &2022, Jun-24
8	State the name and purpose of any 6 special function registers (SFRs) of 8051 microcontroller.	5	Dec 2021, Jun-24
9	List the IO ports available in 8051	10	Dec 2021, Jun-24

CST309 Management of Software Systems

Module I			
SL. No	Questions	Marks	Year
1	Incremental model is better than waterfall model for most business, e-commerce and personal systems. Justify the statement. Or	7	Dec2022/ Dec 2021
	What is meant by incremental delivery of software? Mention its advantages and disadvantages. Or	7	
	Outline the advantages of incremental development models over Waterfall model.	3	
2	Explain Agile Development techniques and Agile Project Management or Explain the principles of agile software development.	7	Dec2021/ June 2024
3	What are the essential attributes of professional software engineering?	3	Dec 2023
4	List out any three software process models.	3	Dec 2023
5	Differentiate plan-driven and agile software development approach	3	Dec 2021
6	Explain the major phases in waterfall model of software development. Which phase consumes the maximum effort for developing a typical software product? or	7	Dec2021/ Dec 2023 / June 2024
	Explain the various stages of waterfall model. Also list out any three situations where waterfall model is only applicable. or		
	Explain waterfall model of software design		
7	Explain different process activities	8	Dec2021/ Dec 2024
8	How does an agile approach help software developers to capture and define the user requirement effectively?	3	Dec 2022
9	Mention the ethics of software engineering	3	June 2024
10	Draw and explain the process of software specifications.	7	June 2024

11	Design Boehm's Spiral model and its importance. Or Mention the situations where Boehm's spiral model is used for software design. Also list out the advantages and disadvantages of spiral model.	7	Dec2022 / Dec 2024
	Or List out the situations where spiral model is used for software process.	3	
12	Illustrate how the process differs in agile software development and traditional software development with a socially relevant case study.	7	Dec 2022
13	Describe the relevance of using Pair programming and Refactoring during Agile development process	7	Dec 2022

Module II			
SL. No	Questions	Marks	Year
1	Mention any three reasons to justify software architecture is important.	3	Dec 2023
2	Illustrate Requirement elicitation and analysis process with the help of a diagram.	8	Dec 2021 / Dec 2023 / Dec 2021
	Or Explain the different stages in requirement elicitation.	7	
	Or Why is requirements elicitation considered as a critical task in requirements engineering? Explain any two methods for requirements elicitation.	6	
3	How do you prepare a software requirement specification?	3	Dec 2022 /Dec 2021
4	Compare functional and non-functional requirements.	7 / 3	Dec 2023 / Dec 2022 / June 2024
5	Explain the process of requirements validation in software process	7	June 2024
6	Explain different architectural styles used in Software design	6	Dec 2021 June 2024
	Or Explain different software architectures.	7	
7	Discuss the factors which are considered during the Components selection and design process.	3	Dec 2022
8	What is software component? Explain the process of designing class-based components.	7	Dec 2023 June 2024
	Or What is meant by component level design in software? Also explain the design of component level in web-apps.		

9	Describe the various activities under Requirements engineering process. or List out generic activities needed in requirement engineering process	7 3	Dec 2022 Dec 2023
10	Outline the concept of traceability matrix and Requirements management planning.	7 / 3	Dec 2022 June 2024
11	What are Use cases? Draw the Use case diagram for an ATM.	7	Dec 2022
12	Explain Personas, Scenarios and Feature identification. or Define personas in software process. Also Explain the different aspects of persona. or With respect to software engineering explain i) Personas ii) Scenarios iii) user stories	7	Dec 2022 Dec2023 Jun 2024

Module III

SL. No	Questions	Marks	Year
1	Differentiate between GPL and LGPL. or Explain the following open-source licence management. i) GPL ii) LGPL iii) BSD	3 7	Dec 2022 Dec2023
2	Compare White Box testing and Black box testing.	3/7	Dec2021 Dec2022 Dec2023 June2024
3	Describe validation testing and integration testing methods of software.	7	Dec2023
4	Explain post-mortem evaluation in software process	3	Dec 2023
5	Differentiate between Formal and Informal review techniques. or Explain formal technical review. Also explain the objectives of technical review.	7	Dec2021 Dec2022 June2023
6	Explain System testing and its variants.	3/7	Dec 2021 Dec 2022
7	Explain software evolution process and software management.	7	Dec2023
8	Explain various types of testing documentation and its importance.	7	June 2024
9	What is meant by path testing in software design. Also explain the process of path testing.	7	Jun 2024

10	Describe Continuous Integration, Delivery and Deployment (CI/CD/CD) in DevOps Automation.	8/7	Dec 2021 Dec 2023
11	What are design patterns? What are the essential elements of design patterns?	7	Dec 2022
12	Differentiate between Top-down and Bottom-up Integration testing methods with suitable diagrams.	7	Dec 2022

Module IV			
SL. No	Questions	Marks	Year
1	Describe the COCOMO cost, estimation model.	3	Jun 2024
2	List out the factors that affect software pricing.	3	Dec 2021
3	Mention any three features of software version management. or Explain version management in software engineering	3 7	Dec 2021 Jun 2024
		4	Dec 2021
4	List out and explain the fundamental project management activities.	3	Dec 2022
5	Explain the Software Risk management process with the help of neat diagram. With suitable diagram explain risk management process	10	Dec 2021
		7	Dec 2022
			Dec 2023 June 2024
6	Define software configuration management. Explain different activities involved in configuration management. or Describe the process of release and configuration management in software	10	Dec 2021
		7	Dec 2023
7	Summarize Software Project planning process.	4	Dec 2021
8	Describe Kanban methodology and lean approaches in software project management	7	Jun 2024
9	Explain the different factors influencing the project management.	7	Dec 2023
10	Discuss the role of using Backlogs and Sprints in SCRUM frameworks. or Explain SCRUM framework for software development	3 7	Dec 2023
11	Explain plan driven development and project scheduling.	7	Dec 2022
12	What is algorithmic cost modelling? What problems does it suffer from when compared with other approaches to cost estimation? or Explain any two techniques used for software cost estimation.	7	Dec 2022
		3	Dec 2023

Module V			
SL. No	Questions	Marks	Year
1.	Discuss software quality dilemma.	3	Dec 2022
2	Explain different types of failures in micro service system. Or	3	Dec 2023 June 2024
	Explain the important characteristics of micro services. Or		
	Describe the architecture of micro services. Also explain architecture design decisions	7	
3	Explain elements of Software Quality Assurance and SQA Tasks. or	3	Dec2021 Dec2022 Dec2023 June2024
	Explain various elements of software quality assurance	7	
4	Describe different levels of the CMMI model. or	3	Dec2021 Dec2023
	Explain CMMI software process improvement framework	7	
5	Describe the process software measurement and metrics	7	Jun 2024
6	Explain the basic and intermediate level services provided by cloud service. Or	7	June 2024
	Explain the features of cloud-based software.	3	
7	List out the metrics that are used to measure software quality. Justify how these metrics interpret the quality of the Software.	5	Dec 2021
8	Explain virtualization and container-based virtualization in cloud server.	7	Dec 2023
9	Describe in detail about the Software Process Improvement (SPI) process. Or	10	Dec 2021 Dec 2022
	Outline the elements of a SPI framework	7 4	
10	Explain cloud software characteristics.	3	Dec 2022
11	Compare CMMI and ISO 9001:2000. Or	7	Dec2022 Dec2023
	What are the software quality factors described under ISO 9001:2000.	3	
12	How is Software Quality achieved during the Software engineering process?	7	Dec2022 Dec2023

MCN 301 DISASTER MANAGEMENT

MODULE 1			
Sl.No	QUESTIONS	Marks	Year
1.	Define the term "biosphere" and describe the three main components that constitute it?	3	DEC 2023
2.	What are disasters? What are their causes?	3	DEC 2023
3.	What role do local governments play in implementing disaster management legislation in India?	3	DEC 2023
4.	(a) Briefly explain Indian Monsoon and factors affecting Indian Monsoon? (b) Explain greenhouse effect and global warming?	10	DEC 2023
5.	What are Tsunamis? How are they caused?	10	DEC 2023
6.	What distinguishes crisis counselling from regular counselling?	3	DEC 2023
7.	Explain the following terms in the context of disaster management (a) Disaster 14 Risk Management (b) Crisis Counselling (c) Exposure (d) Early Warning System (e) Damage Assessment (f) Resilience (g) Needs Assessment	10	DEC 2023
8.	Define the following terms: a) Disaster b) Hazard c) Risk	6	DEC 2021
9.	State and explain crisis counselling. Identify the necessity of crisis counselling.	8	DEC 2021
10.	Differentiate between acceptable risk and residual risk.	3	DEC 2022
11.	State the composition of lithosphere?	3	DEC 2022
12.	Illustrate with diagram the layers of earth's atmosphere.	8	DEC 2022
Module 2			
1.	(a) Explain the types of vulnerabilities and approaches to assess them. (b) Explain the application of hazard maps.	8	DEC 2023

2.	Describe in detail the approaches and procedures involved in disaster risk assessment.	6	DEC2021
3.	Explain the four different types of vulnerability. List any four socio-economic indicators of human capital as livelihood asset.	4	DEC2023
4.	Explain the application of hazard maps.	6	DEC 2023
5.	List the components of risk assessment. Explain the contemporary approaches to risk assessment.	9	DEC2022
6.	Explain the method of expressing population risk	5	DEC 2022
7.	Explain physical vulnerability and ecological vulnerability.	3	DEC2022

MODULE 3

1.	(a) Explain the factors that decide the nature of disaster response. (b) Explain disaster relief and international relief organizations.	10	DEC2023
2.	State the requirements for effective disaster response.	4	DEC 2021
3.	(a) Explain the core elements of disaster risk management. (b) Explain the different disaster response actions.	8	DEC 2023
4.	Define 'relief' in the context of disaster management. Identify the principles guiding relief.	6	DEC 2021

5.	State the principle of qualitative risk assessment and the method of expressing risk qualitatively.	3	DEC 2021
6.	State the different types of disaster response	6	DEC 2021
7.	Briefly explain the levels of stakeholder participation in the context of disaster risk reduction	3	DEC 2023
8.	List any six public health services required in responding to disasters.	3	DEC 2022
9.	State and explain the types of disaster mitigation measures	4	DEC 2022
10.	Identify the factors that determine the nature of disaster response and explain	10	DEC 2022

11	State and explain the types of disaster preparedness	6	DEC 2022
12.	Identify the standard operating procedures to be followed during a disaster stage and explain.	8	DEC 2022
MODULE 4			
1	How can one ensure effective disaster communication by outlining the necessary 9 steps, and what obstacles or barriers to communication should be considered in this context?	6	DEC 2023
2.	What is the process for identifying stakeholders in disaster management?	4	DEC 2023
3.	What are the barriers to communication?	4	DEC 2021
4.	Distinguish between risk communication and crisis communication.	3	DEC 2023
5.	Describe the effective ways of promoting stakeholder participation in disaster risk reduction. State its benefits.	4	DEC 2023
6.	Explain capacity building , relevance of capacity assessment and the different methods of assessing capacity in disaster risk management.	8	DEC2021
7.	State and explain the basic principles of participatory rural appraisal tools	5	DEC2022
8.	Explain the characteristics of effective crisis counsellors. State the advantages of crisis counselling.	9	DEC2022
9.	State and explain the steps for effective communication	8	DEC2022
MODULE 5			
1.	Discuss the priorities for action identified in the Sendai Framework. How can these priorities be tailored to address the specific needs and challenges faced by India?	10	DEC 2023
2.	What role do local governments play in implementing disaster management 5 legislation in India?	4	DEC 2021
3.	State the targets, priorities and guiding principles of Sendai Framework for disaster risk reduction.	8	DEC 2021
4.	Explain the institutional arrangement for disaster management in India	6	DEC2021

5.	List the global targets of Sendai framework and explain	7	DEC 2022
6.	Explain the role, composition and responsibilities of National Disaster Management Authority.	7	DEC 2022
7.	Discuss the key features and objectives of the National Disaster Management 7 Policy in India. How does it guide the country in managing and reducing disaster risks?	10	DEC 2023
8.	What are the most common types of disasters faced by India.	4	DEC 2023