MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Sponsored by CMR Educational Society

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – „A" Grade - ISO 9001:2015 Certified) Maisammaguda, Dhulapally (Post Via Hakimpet), Secunderabad – 500100, Telangana State, India.
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DEPARTMENT OF INFORMATION TECHNOLOGY

II B.TECH I SEMESTER R17 SUPPLEMENTARY PREVIOUS QUESTION PAPERS

LIST OF SUBJECTS

CODE	NAME OF THE SUBJECT
R17A0510	Computer Organization
R17A0461	Digital Logic Design
R17A0504	Data Structures using C++
R17A0401	Electronic Devices and Circuits
R17A0503	Mathematical Foundation of Computer Science
R17A0024	Probability and Statistics

R17

Code No: R17A0510

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Computer Organization

(CSE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

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1	Brief on fixed and floating point representation of relevant data. Write an algorithm for adding and subtracting 2 floating point binary numbers.	**[14M]**
2	What are the types of micro operations? Write a note on arithmetic and logical unit	**[14M]**
3	Describe the phases in Instruction cycle. Classify the instructions of typical computers.	**[14M]**
4	What are hardwired and micro programmed controls? Write an example for a Micro program.	**[14M]**
5	Explain the following addressing modes i) Register mode ii) Immediate mode iii) Indirect mode iv) Absolute mode	 **[3M]** **[4M]** **[3M]** **[4M]**
6	Explain addition and subtraction algorithm flow chart with example.	**[14M]**
7	What is pipelining? Name the two pipeline organizations. Explain about the arithmetic pipeline with the help of an example.	**[14M]**
8	Define locality of reference and explain use of a cache memory and direct – mapped cache memory	**[14M]**

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R17

Code No: R17A0461

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Digital Logic Design

(IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

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1	a) Convert $(657)_8$ into decimal and convert $(2348)_{10}$ into hexadecimal.	**[6M]**
	b) Perform the following using 2's complement: i) (11010) – (1101) ii) (101011) – (100110)	**[8M]**
2	a) Encode data bits 1101 into the 7-bit even parity hamming code	**[6M]**
	b) Realize OR gate, AND gate and XNOR gate using NAND gate	**[8M]**
3	a) Explain the use of K-Map in digital circuit	**[3M]**
	b) Using K-map, simplify the given function and also indicate the prime Implicants and essential prime Implicants. $F(A,B,C,D) = \Sigma\, m(1,3,7,11,15) + \Sigma\, d(0,2,4)$.	**[11M]**
4	Obtain the simplified expression in product of sums.	
	a) $F(A,B,C,D) = \pi(0,1,2,3,4,10,11)$	**[7M]**
	b) $F(A,B,C,D) = \pi(1,3,5,7,13,15) + d(0,4)$	**[7M]**
5	a)Design a combinational circuit by converting BCD to gray code	**[8M]**
	b)Explain about binary multiplier	**[6M]**
6	a)Design and explain about 4-bit comparator	**[7M]**
	b)Design a combinational circuit to realize half Subtractor using basic gates.	**[7M]**
7	a)Design a sequential circuit by converting JK flip flop to D-Flip flop	**[8M]**
	b)Design a 4-bit Bidirectional Shift Register.	**[6M]**
8	a)Compare PROM,PLA and PAL logic devices	**[8M]**
	b)What are the advantages of PLDs over fixed function ICs	**[6M]**

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R17

Code No: R17A0504

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Data Structures using C++

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.
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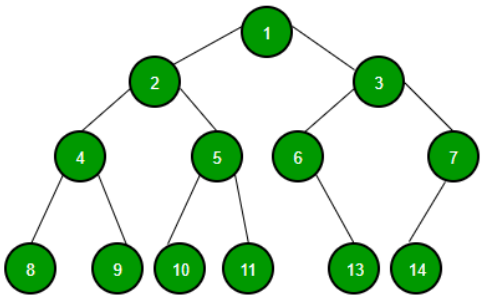
1	a)	Explain about asymptotic notations in detail	**[7M]**
	b)	Write a C++ program to sort the given array with n elements in ascending order using Insertion Sort.	**[7M]**
2	a)	Write a C++ program to search for given key elements in an array using Linear Search	**[7M]**
	b)	Explain the process of sorting the following elements in descending order using Heap Sort: 23, 45, 12, 56, 9, 67, 98, 41, 83, 76, 15	**[7M]**
3	a)	Implement Stack ADT using arrays.	**[7M]**
	b)	What is a Threaded Binary Tree? What are the advantages of it? Explain with an example.	**[7M]**
4		Explain insertion, deletion and search operation for given binary tree	**[14M]**



5		Implement insertion and deletion in Priority Queue ADT.	**[14M]**
6		Explain the process of Merge sort with suitable example.	**[14M]**
7	a)	What is hashing? Apply double hashing for the following elements with table size 20: 16, 8, 63, 9, 27, 37, 48, 5, 69, 34, 1	**[7M]**
	b)	Explain about skip list representation for dictionary with an example.	**[7M]**

8 Implement insertion, deletion and traversal operations in a Binary Search Tree. **[14M]**

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Code No: R17A0401 **R17**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Electronic Devices and Circuits

(EEE, ECE, CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

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1	a. Explain the V-I characteristics of a PN Junction diode under forward and reverse bias.	**[10M]**
	b. If the current of silicon diode with V_T=26mV doubles, find the increase in forward voltage drop.	**[4M]**
2	Define tunneling. Explain the operation of a tunnel diode using energy band diagram.	**[14M]**
3	Explain the working of a full wave rectifier and derive expression for Rectification Efficiency, Ripple Factor and Transformer Utilization Factor of a half wave rectifier with resistive load	**[14M]**
4	a. Explain the operation of full wave rectifier with LC filter and derive the expression for ripple factor.	**[10M]**
	b. A full wave rectifier circuit uses capacitor filter with 500μF capacitor and provides load current of 200mA at 8% ripple. calculate i) dc voltage across the capacitor, ii) peak rectified voltage obtained from 50Hz supply.	**[4M]**
5	Derive the expression for current gain, voltage gain, input and output impedances of a CE amplifier using h- parameter exact and approximate analysis.	**[14M]**
6	a. Explain the input and output characteristics of CB configuration and from the output characteristics explain different regions of operation of transistor.	**[10M]**
	b. Explain the concept of base width modulation	**[4M]**
7	a. Explain the need for biasing.	**[4M]**
	b. Draw the circuit of collector to base bias and derive the expression for stability factor.	**[10M]**
8	a. Explain the construction and operation of a JFET and plot the drain and transfer characteristics.	**[10M]**
	b. Differentiate JFET and MOSFET	**[4M]**

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R17

Code No: R17A0503

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Mathematical Foundation of Computer Science

(CSE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

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1 a. Show that ¬ P∧ (¬Q ∧ R) ∨ (Q v R) ∨ (P ∧ R) ⇔ R without constructing truth table **[7M]**
b. Prove that the formula Q V (P∧¬Q) V(¬ (¬P V ¬Q) ⇔ P v Q **[7M]**

2 a. Prove the equivalence p ∨ q ∨ (¬ p ∧ ¬ p ∧ r) ⇔ p ∨ q ∨ r **[7M]**
b. Write the following statements in symbolic form using quantifiers. **[7M]**
i. Every real numbers have an additive inverse.
ii. The set of real numbers has a multiplicative identity.

3 The function f : R →R and g : R→R are defined by f (x) = 3x + 7 for all x € R and g(x) = $x(x^3 - 1)$ for all x € R . Verify that *f* is one to one but *g* is not and also find $f^{-1}(0)$ and $f^{-1}(-4)$. **[14M]**

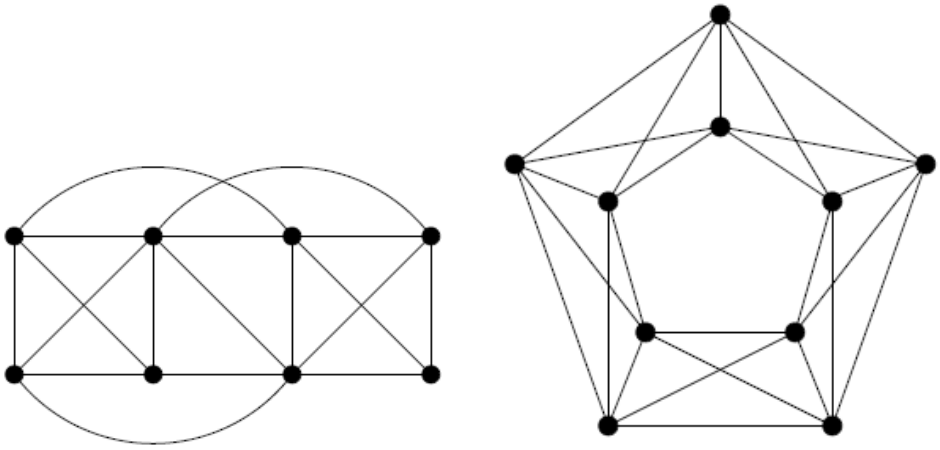
4 a. Explain partial ordering relation with example. **[7M]**
b. Define lattice and give example **[7M]**

5 a. Define group and explain with an example **[7M]**
b. What is Monoid? Explain abelian monoid. **[7M]**

6 a) A Survey of 500 television viewers of a sports channel produced the following information. 285 watch cricket, 195 watch hockey, 115 watch football, 45 watch cricket and foot ball, 70 watch cricket and hockey, 50 watch hockey and foot ball and 50 do not watch any of the three kinds of games?Find the Number of viewers who watch all the three kinds of games. **[8M]**
b) Explain Sum Rule and Product Rule. **[6M]**

7 a. Solve the recurrence relation $a_n - 7a_{n-1} + 16a_{n-2} - 12a_{n-3} = 0$ for n>=3 with initial conditions $a_0 = 1, a_1 = 4$ and $a_2 = 8$. **[7M]**
b. A byte is a sequence of 8 bits. Find the number of bytes. **[7M]**
i) Begin with 11 and end with 11
ii) Begin with 11 and do not end with 11
iii) Begin with 11 or end with 11

8 Define the chromatic number and find the chromatic number of the following graphs **[14M]**



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R17

Code No: R17A0024

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Probability and Statistics

(CSE & IT)

Roll No										

Time: 3 hours **Max. Marks: 70**

Answer Any **Five** Questions
All Questions carries equal marks.

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1 A Random variable X has the following probability function: **[14M]**

x	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

i) Determine K
ii) Evaluate $P(X<6), P(X\geq 6), P(0\leq x\leq 4)$
iii)if $P(X\leq c)>1/2$, Find the Minimum value of c and
iv)Mean
v)Varience

2 Out of 800 families with 5 children each, how many families would you expect to have **[14M]**

a)3 boys
b)5 girls
c)either 2 or 3 boys
d) atleast one boy
Assume Equal Probabilities for boys and girls .

3 A sample of 12 fathers and their elder sons gave the following data about their elder sons. Calculate the Coefficient of rank correlation. **[14M]**

Fathers	65	63	67	64	68	62	70	66	68	67	69	71
Sons	68	66	68	65	69	66	68	65	71	67	68	70

4 a)What are the lines of regression. **[4M]**
b)Find regression line of X on Y **[10M]**

X	40	52	60	68	70	72	80
Y	80	110	121	140	145	148	165

5 A Population consists of six numbers 4,8,12,16,20,24. Consider all samples of size two wnich can be drawn without replacement from this population. Find **[14M]**
a)The population mean
b)The population standard deviation
c)the mean of the sampling distribution of means
d)The standard deviation of the sampling distribution of means.

6 a) Define estimate, estimator and estimation. **[4M]**
b) Measurments of the weights of a random sample of 200 ball bearings made by a certain machine during one week showed a mean of 0.824 and a strandard deviation of 0.042. Find the maximum error at 95% confidence interval? **[10M]**
Find the confidence limits for the mean if x=32

7 The means of two random samples of sizes 9 and 7 are 196.42 and 198.82 respectively. The sum of the squares of the deviations from the mean are 26.94 and 18.73 respectively. Can the sample be considered to have been drawn from the same normal population. **[14M]**

8 At a certain petrol pump, customers arrives in a Poission process with an average time of five minutes between arrivals. The time intervals between serves at the petrol pump follows exponential distribution and the mean time taken to service a unit is two minutes. Find the following; **[14M]**

a)Average time a customer has to wait in the queue.

b)By how much time the flow of the customers be increases to justify the opening of other service point, where the customer has to wait for five minutes for the service.

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