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. Contact Number: 040-23792146/64634237, E-Mail ID: mrcet2004@gmail.com, website: www.mrcet.ac.in

DEPARTMENT OF INFORMATION TECHNOLOGY

II B.TECH I SEMESTER R15 SUPPLEMENTARY PREVIOUS QUESTION PAPERS

LIST OF SUBJECTS

CODE	NAME OF THE SUBJECT
R15A0461	Digital Logic Design
R15A0504	Data Structures using C++
R15A0401	Electronic Devices and Circuits
R15A0503	Mathematical Foundation of Computer Science
R15A0024	Probability and Statistics

Code No: **R15A0461**
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Supplementary Examinations, June 2022
Digital Logic Design
(CSE)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	i) Convert $(657)_8$ into decimal.	**[4M]**
	ii) Convert $(2348)_{10}$ into hexa decimal.	**[4M]**
	iii) Convert $(110001.1010010)_2$ into hexadecimal.	**[4M]**
	iv) Convert $(423.25)_{10}$ into Hex.	**[3M]**
2	Derive and Implement Exclusive OR function involving three variables using only NAND function.	**[15M]**
3	Obtain the simplified expression in product of sums.	**[7M]**
	a) $F(A,B,C,D) = \pi(0,1,2,3,4,10,11)$	**[8M]**
	b) $F(A,B,C,D) = \pi(1,3,5,7,13,15$	
4	Reduce the following function using K-Map.	**[15M]**
	$F(A,B,C,D,E) = \Sigma m(1,4,8,10,11,20,22,24,25,26)+d(0,12,16,17)$	
5	a)Design a full adder by using two half adders.	**[7M]**
	b) Explain about decoder circuit and implement the 4×16 decoder by using two 3×8 decoders.	**[8M]**
6	Explain the design procedure for multiplexers and de-multiplexers and draw the logic diagram of a 4-to-1 line multiplexer with logic gates	**[15M]**
7	a) What is a flip-flop? Design the basic flip-flop using NOR gates and explain.	**[7M]**
	b) What is an excitation table? Write the excitation tables for JK and T flip-flops.	**[8M]**
8	Give the logic implementation of a 32×4 bit ROM using decoder of a suitable size.	**[15M]**

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R15

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)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a.	Explain Asymptotic notations.	**[7M]**
	b.	Write algorithm for insertion and search operatiions in linked list	**[8M]**

2	Write algorithms for insertion sort and bubble sort.	**[15M]**

3   Differentiate stacks with queue. Write an algorithm to create, push, pop elements   **[15M]**
on stack.

4   Develop an algorithm to perform operations on Binary tree traversal.   **[15M]**

5   Create a Priority queue and perform the operations like insertion, deletion from   **[15M]**
the priority queue.

6   What are different types of sorting techniques used according the size of the data?   **[15M]**
Explain time complexities of sorting techniques at different cases.

7   Illustrate Hashing. Explain Open Hashing technique.   **[15M]**

8   Explain the concept of a) adjacency matrix   b) BFS   **[15M]**

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Code No: **R15A0401**
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
(ECE & CSE)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	a.	Explain the Diffusion and Drift currents for a semiconductor	**[5M]**
	b.	Explain the formation of P-N Junction diode and its operation with the help of V-I Characteristics	**[10M]**

2   Explain the working of Tunnel diode and its V-I characteristics. And what is the sufficient condition for tunneling   **[15M]**

3   With circuit and necessary waveforms explain the operation of bridge rectifier.   **[15M]**

4   Explain the construction and working of Zener diode.   **[15M]**

5   What are the different breakdowns in a transistor? Explain in detail.   **[15M]**

6   When a transistor operates in common-emitter configuration, the base current is 20µA. The collector current has been changed from 4.5 mA to 4.7 mA if the collector-emitter voltage is changed from 8.2 V to 11.5 V. Determine the output resistance and dc current gains α and β   **[15M]**

7   What is Biasing? Explain the need of it. List out and explain different types of biasing methods.   **[15M]**

8   Describe briefly J-FET and MOSFET and compare and contrast them.   **[15M]**

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R15

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: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1	Show that ~p follows from the set of premises (r→~q),rVs,s→~q, p→q using indirect method of proof	**[15M]**
2	a). Define PDNF and find PDNF for (~P ^{V} R) $^\wedge$(Q^V P).	**[7M]**
	b). Explain any five rules of inference with examples.	**[8M]**
3	Find all the properties that satisfies for the following algebraic systems under the binary operations '*' and '+'.	**[7M]**
	(a) Odd integer	**[8M]**
	(b) All positive integers	
4	Draw Hasse diagram represent the partial order {(A,B): A≤B} on the power set p(s) where s= {a,b,c} where ≤ represent subset relation	**[15M]**
5	a) Determine the number of integer between 1 and 10,000,000 have the sum of digits equal to 18	**[15M]**
	b) Determine the number of ways possible to wear 5 rings on 4 fingers.	
6	a) Find the number of non negative integral solutions to $X_1+X_2+X_3+X_4+X_5=10$	**[15M]**
	b) Find the number of arrangements of letters "MISSISSIPPI".	
7	Find the Chromatic number of the following graphs	
	(a) Complete Graph (K_3)	**[5M]**
	(b) Complete Bipartite Graph ($K_{2,3}$)	**[5M]**
	(c) Regular Graphs (K_3)	**[5M]**
8	Verify the following graphs are isomorphic or not?(Figure)	**[15M]**

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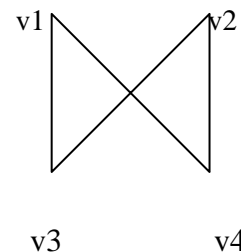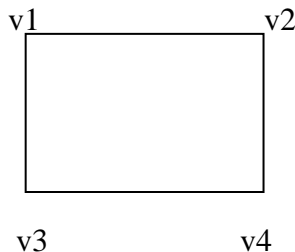
Code No: R15A0024
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech I Semester Supplementary Examinations, June 2022
Probability and Statistics
(CSE & IT)

Roll No										

Time: 3 hours   **Max. Marks: 75**

Answer Any **Five** Questions
All Questions carries equal marks.
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1   Calculate the coefficient of correlation between the variables X and Y   **[15M]**

x	2	3	8	11	4	5	9	7	5	7
y	21	42	102	130	52	57	105	85	62	90

2   A Businessman goes to hotels X,Y,Z 20%,50%,30% of the time respectively. It   **[15M]**
    is known that 5%,4%,8% of the rooms in X,Y,Z hotels have faulty
    plumbings.What is the probability that businessman's room having faulty
    plumbing is assigned to hotel Z?

3   If the p.d.f of a continuous random variable is   **[15M]**
    f(x)= ½ sinx, $0 \le x \le \pi$
    Find   a) Mean   b) Mode   c) $P(0 \le x \le \pi/2)$

4   If a possion distribution is such that p(x=1).3/2=p(x=3), find   **[15M]**
    i)$P(x \ge 1)$ ii)$P(x \le 3)$ iii)$P(2 \le x \le 5)$

5   A population consists of five numbers 2,3,6,8 and 11. Consider all possible   **[15M]**
    samples of size two which can be drawn with replacement from this population.
    Find
    a) The mean of population
    b)The standard deviation of population
    c)The mean of Sampling distribution of means.

6   In a sample of 600 students of a certain college 400 are found to use the ball   **[15M]**
    pens. In another college, from a sample of 900 students 450 were found to use
    ball pens. Test whether two colleges are significantly different with respect to the
    habit of using ball pens.

7   A sample of 100 iron bars is said to be drawn from a large number of bars   **[15M]**
     whose lengths are normally distributed with mean 4 feet and S.D 6 feet. If the
     sample mean is 4.2 feet, can the sample be regarded as a truly random sample?

8   A T.V/P.C repair man finds that the time spent on his jobs has an exponential   **[15M]**
     distribution with mean 30 minutes. He repairs sets in the order in which they
     arrive. The arrival of sets is approximately Poission with an average of 10 per an
     eight hour day. Find the repairman's idle time each day. How many jobs are ahead
     of the average set just brought in?

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