

MAR THOMA RESIDENTIAL SCHOOL
SECOND TERM EXAMINATION 2019-2020

CLASS: XI

MARKS:70

SUBJECT: COMPUTER SCIENCE

TIME: 3 HRS

PART- I (20 Marks)

Answer *all* questions

Question 1

- a) Convert $(4567)_8$ to its Binary equivalent . (1)
 - b) What is Encapsulation? (1)
 - c) Define Software Piracy. (1)
 - d) What is Linear and Mutual Recursion? (1)
 - e) Draw the logic gate for the following expression . (1)
- $$A'BC + A'B'C + A'C'$$

Question 2

- a) Explain Math.round() and Math rint() with examples. (2)
- b) Given are the values, a=8, b=10.
find i) a & b ii) a | b (2)
- c) What are Pure functions? Give an example. (2)
- d) Perform the following operation (2)
i. $10110.100 * 1011.011$
- e) Define lastIndexOf() function with an example. (2)

Question 3

- a) Write a program in Java to check and display whether a given year is leap year or not. A year is said to be leap year if it is divisible by 4 and 400. (5)

PART- II (50 MARKS)

Answer *six* questions in this part, choosing *two* questions from Section A, *two* from Section B and *two* questions from Section C

SECTION –A

Answer *any two* questions

Question 4

- a) State Absorption law and Distributive law and verify it using truth tables. (5)
- b) Draw the logic circuit for (3)
- i. $AB'C + A'B'D + AB'C + A'CD$
- ii. $AC(A+B') + (A'+B)C$
- c) Subtract the Octal number $(346)_8$ from $(4271)_8$ (2)

Question 5

- a) Draw the logic gate of EX-OR gate and EX-NOR gate using NAND gate. (5)
- b) Subtract the following using 1's compliment (3)
- i. $(10011)_2 - (1100)_2$
- ii. $(10110)_2 - (1111)_2$
- c) What is Tautology and Contradiction in Propositional logic? Give Examples. (2)

Question 6

- a) Write a program in Java to enter two numbers and check whether they are Twin prime or not. (5)

Twin prime numbers are those consecutive prime numbers which differ by 2.

Eg: (11,13), (17,19).....etc

- b) Simplify the following by using Boolean algebra and draw logic diagram of the simplified expression using basic logic gates. (3)

$$A'BC + A'BC' + AB'C' + AB'C$$

- c) Perform the following operation (2)
- $1010111 / 100$

SECTION B

Answer any two questions

(10)

Question 7

Syndicate bank charges interest for the vehicle loan as per the following tariff

<u>Number of years</u>	<u>Rate of Interest</u>
Up to 5 yrs	15%
More than 5 and up to 10yrs	12%
Above 10yrs	10%

Write a program to model a class with the following specifications

Class name : Loan

Data members/Instance variables :

int time :time for which the loan is sanctioned

double principal : amount sanctioned

double rate : rate of interest

double interest : to store the calculated interest

$\text{Interest} = (\text{Principal} * \text{Rate} * \text{Time}) / 100$

$\text{Amount} = \text{Principal} + \text{Interest}$

Member methods:

void getdata() : to accept principal,time and rate

void calculate() : to find interest and amount

void display() : to display interest and amount

Write the main method to create an object of the class and call the member methods.

Question 8

(10)

Write a program in Java to input a sentence in upper case and frame a word by adding the first letter of each word and also arrange the alphabets of the new word in an alphabetical order.

Sample input: THE CAPITAL OF INDIA IS NEW DELHI

Sample output: The new word : TCOIIND

The new word in alphabetical order : CDIINOT

Question 9

Write a program in Java to store different numbers in a 4 * 4 matrix. Now, swap the numbers of the 1st row with the numbers of the 4th row in the given matrix. (10)

SECTION C
Answer *any two* question

Question 10

a) What is String Tokenizer? Explain the methods in String Tokenizer.

b) What do you mean by Netiquette? (4)

Question 11

a) Write an algorithm to input a number and check whether it is palindrome. (1)

b) What is Intellectual Property Right? List its properties. (3)

Question 12

Create a package Stringpro that includes a class StringOP with the following specifications (5)

Class name : StringOP

Data members/Instance variables :

str, rev : to store strings

Member methods:

void input() : to accept a string str

void process() : to reverse the string str and store the reversed string in rev

void display() : to display both the strings

void find() : to find the no of characters in the string

Write main class that will import the package Stringpro. Create an object of the class StringOP to call the member methods.