Special()	:	default constructor
void read()	:	to accept the number
int factorial(int x)	:	return the factorial of a number using recursion.
boqlean isSpecial()	:	checks for the special number by invoking the function factorial() and returns true if Special, otherwise returns false.
void display()	:	to show the result with an appropriate message.

Specify the Special, giving details of void read() and int factorial (int).

Question 11. **[5]**

Create a class to create a data file named student.txt storing rol no., name and total marks for 50 students.

Question 12 **[5]**

Write methods of class Compare :

Int arrange(int num): arranges the digits of a number in ascending order.

String arrange (String wrd): arranges the letters in alphabetical order.

Quarterly Examination 2018-2019
Computer Science (Paper-1)

Class : XI

Time : 3 Hrs.+15mins. **Full Marks : 70**

(Candidates are allowed additional 15 minutes for only reading the paper. They must NOT start writing during this time).

Answer all questions in Part I (compulsory) and seven questions from Part-II, choosing three questions from Section-A, two from Section-B and two from Section-C. All working, including rough work, should be done on the same sheet as the rest of the answer. The intended marks for questions or parts of questions are given in brackets [ ].

PART I

Answer all questions. While answering questions in this part, indicate briefly your working and reasoning, wherever required.

Question 1 **[1x5=5]**

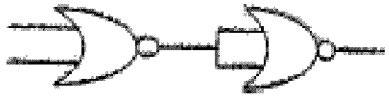
a. State Commutative Law and verify using the truth table.

b. Draw the truth table to verify (a+b)' = a'.b'

c. Find the dual of following: BC'+1=1.

d. Draw the logic gate for (A+B)'

e. Write expression for



{Turn Over}

Question 2. **[10]**

Convert following as instructed :

a. $(10011)_2$ - ($)_{10}$

b. $(207)_8$ - ($)_{10}$

c. $(121)_{10}$ - ($)_2$

d. $(304)_{10}$ - ($)_8$

e. $(A10B)_{16}$ - ($)_{10}$

Question 3. Fill in the blanks : **[5]**

a. '?' operator is also called _____.

b. Maximum storage of data type double is _____.

c. \t character is used to give_____.

d. _____ prints the statement on the same line.

e. Java is of dual utility. _____ and _____.

PART - II

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

SECTION - A

Answer any two questions

Question 4 **[10]**

a. Draw logic circuit diagrams for the following

i. XY+XY'

j. (A+B)(B+C)(C'+A')

k. XYZ+X'YZ'

void isPalin( ) : to check whether the accepted number is a Palindrome or not by calling the rev( ) function.

Specify the class Palindrome giving details of the constructor and member functions void read( ), int rev (int), void disp( ) and void isPalin( ). Define the main( ) function to create an object and call the member function to enable the task.

Question 9 **[10]**

Design a class Convert to convert a decimal number to its equivalent in base 2 and to convert this binary number back to its decimal equivalent. E.g.

(i) The decimal number 35 is 100011 in base 2.

(ii) The decimal equivalent of binary number 100011 is 35.

SECTION-C

Each program/Algorithm should be written in such a way that it clearly depicts the logic of the problem step wise. This can also be achieved by using pseudo codes.

Question 10 **[5]**

A Special number is a number in which the sum of the factorial of its digits is equal to the number. Example: 145(1!+4!+5!=145). Thus 145 is a special number.

Design a class Special to check if the given number is a Special number or not. Some of the members of the class are given below:

Class name : Special

Data Members :

n : integer to store the number

Member Functions :

{Turn Over}

b. Prove using Truth Table —

i. $(x+y)(x+z)=x+yz$

ii. $(A+B)B = B$

Question 5.

(a) State the dual form of the following : $XY^{'}$ (XY'Z+X+X'Z') [2]

(b) What are Universal gates. Name them [2]

(c) Convert following as instructed:- [6]

$(1001101)_2$ - ($)_8$

$(A02)_{16}$ - ($)_2$

$(1100111011)_2$ - ($)_{16}$

Question 6.

(a) Prove that $F(A,B,C) = \pi (2,3,4,7) = \sum (0,1,5,6)$ [3]

(b) State the Involution Law. Verify it using the truth table. [3]

(c) Draw the truth table and logic circuit for

i) OR ii) AND [2+2]

SECTION-B

Answer any two questions Each program should be written in such a way that it clearly depicts the logic of the problem. This can be achieved by using mnemonic names and comments in the program.

(Flowcharts and Algorithms are not required.)

The Programs must be written in Java.

Question 7 **[10]**

A class Number has been defined to find the frequency of each digit

b. Prove using Truth Table —

i. $(x+y)(x+z)=x+yz$

ii. $(A+B)B = B$

Question 5.

(a) State the dual form of the following : $XY^{'}$ (XY'Z+X+X'Z') [2]

(b) What are Universal gates. Name them [2]

(c) Convert following as instructed:- [6]

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(a) Prove that $F(A,B,C) = \pi (2,3,4,7) = \sum (0,1,5,6)$ [3]

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i) OR ii) AND [2+2]

SECTION-B

Answer any two questions Each program should be written in such a way that it clearly depicts the logic of the problem. This can be achieved by using mnemonic names and comments in the program.

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The Programs must be written in Java.

Question 7 **[10]**

A class Number has been defined to find the frequency of each digit

{Turn Over}

3

present in it and the sum of the digit and to display the results. Some of the members of the class Number are given below :

Class name	:	Number
Data member	:	num - long integer type
Member functions	:	
Void accept(int n)	:	accept value for num
void Frequency3( )	:	to find the frequency of 3 in the number and display it.
int sumDigits( )	:	to returns the sum of the digits of the number.

Specify the class Number giving the details of the methods. You do not need to write the main function.

Question 8 **[10]**

Design a class Palindrome which checks whether a number is Palindrome or not. The details of the members of the class are given below:

Class name	:	Palindrome
Data members/instance variables:		
str	:	to store a word
revNum	:	to store the reverse of the number
Member functions/methods :		
Palindrome( )	:	constructor to initialize data members with initial values
void read( )	:	to accept the word
int rev(int)	:	to reverse the number using Recursive Technique
void disp( )	:	to display the original number, and the reverse number

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