

ANNUAL EXAMINATION – 2012-2013

CLASS – XI

SUBJECT – COMPUTER SCIENCE (T)

TIME: 03:00 HRS.

M.M.:100

Answers to this paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper.

The time given at the head of the paper is the time allowed for writing the answers.

This paper is divided into two Parts.

Answer all questions from Part one. Part two consist three Sections.

Part one carries 30 marks and part two carries 70 marks.

PART I

(Answer all questions in this Part)

Question 1

- a) Prove that $X+X'$ is a tautology and $X.X'$ is a contradiction? [2]
- b) What is a truth table? What is its significance? [2]
- c) State distributive law. Verify one of the Absorption laws using a truth table [2]
- d) What is meant by Contingency? [2]
- e) Describe the NAND Gate. [2]

Question 2

- a) Verify using truth table that $x + yz = (x + y) (x + z)$ [2]
- b) Draw the truth table and expression for a Half-adder. [2]
- c) State absorption law.. [2]
- d) Draw the truth table to prove that $P \iff Q = (P \implies Q) \cdot (Q \implies P)$ [2]
- e) What is a Accumulator? [2]

Question 3

- a) The following function is a part of some class which is searching the element using binary search technique. The following function returns 1 if the key element is available in the given array otherwise return 0. There are some places in the code marked by ?1?, ?2?, ?3?, ?4?, ?5? and ?6? which must be replaced by statement/expression so that the function works correctly.

```
int binary_search( ?1? , int a[ ] )
{ int mid , low=0, up= ?2? ;
  int pos= -1;
  while(?3?)
  {
  mid=low + up / 2 ;
  if(key == a[mid])
  {
    pos = mid;
    break;
  }
  if(key > mid)
  ?4?
  else
  ?5?
  }
  if(?6?)
  return 1;
  else
  return 0;
}
```

- i) What is the expression/statement at ?1?. [1]
- ii) What is the expression/statement at ?2?. [1]
- iii) What is the expression/statement at ?3?. [1]
- iv) What is the expression/statement at ?4?. [1]
- v) What is the expression/statement at ?5?. [1]
- vi) What is the expression/statement at ?6?. [1]

- b) Explain Call by value with suitable example. [2]
- c) Explain Call by reference with suitable example? [2]

PART II

Answer **seven** question in this part, choosing **three** questions form Section A, **two** questions from Section B and **two** from Section C

SECTION A

Answer any three questions

Question 4

- Draw the logical circuits for the following expression: - [10]
- a) $(X+Y).(X'+Y).(X'+Y')$
- b) $(X+Y+Z).(X+Y'+Z')$
- c) $(X.Y + X'.Y')$
- d) $(XYZ + X'YZ')$

- Question 5**
- a) Draw the logical circuit for the following using NAND gates only:- [5]
- i) $(X.Y + X.Y'Z + XYZ)$
- ii) $ABC+AB'C'+A'BC$
- b) Draw the logical circuit for the following using NOR gates only: - [5]
- i) $(X+Y). (X'+Y). (X'+Y')$
- ii) $(X+Y+Z). (X+Y'+Z')$
- Question 6** Explain Full Adder in detail. [10]
- Question 7**
- a) Solve the following equation algebraically [6]
- i) $(P'.Q')' + P'$
- ii) $X'Y'Z' + X'Y'Z + X'YZ + XY'Z$
- b) Prove the following with the help of truth table. [4]
- i) $AB + BC + CA' = AB + CA'$
- ii) $A (B+C+D) = A$

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 mnemonics names and comments in the program
(Flowchart and Algorithm are not required)

The program must be written in Java

- Question 8**
- a) Write a program to convert the Binary number into Decimal number. [5]
- b) Write a program to calculate the sum of all the palindrome between the range of 100 to 500. [5]
- Question 9** Draw a class student that contains the following member:- [10]
- Data member
Roll number
Name
Marks
Age
- Method:-
write() that will store data to a file stu.dat
read() that will show the detail in file stu.dat
count () that will display the number of record available in file stu.dat
- Question 10** Write a program to store 10 names in an array. Arrange these in alphabetical order by sorting. Print the sorted list And print the longest word available in array. [10]

SECTION-C

Answer any **two** questions

Each program/Algorithm should be written in such a way that it clearly depicts the logic of the problem.
This can be achieved by using pseudo codes.
(Flowcharts are not required)

The program to be written in Java

The Algorithm must be written in general/standard form.

- Question 11** Write a program to enter a sentence and print all the palindrome word. [10]
(ALGORITHM NOT REQUIRED)
- Question 12** Write an algorithm to delete duplicate element from a vector of size 10 (array). [10]
- Question 13** Write a program to insert and delete an element from a Stack (implemented as an array), depending upon user's choice. [10]
(ALGORITHM NOT REQUIRED)

