

U.G. 1st Semester Examination - 2019**COMPUTER SCIENCE****[HONOURS]****Course Code : Com.Sc(H)CCL-101-T**

Full Marks : 60

Time : 2½ Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*1. Answer any ten questions: 2×10=20a) What is the difference between `#include<stdio.h>` and `#include"stdio.h"`?

b) What is BCD? Explain with example.

c) "Declaring a pointer is declaring an Array"
-Explain if it true or false.

d) State the De Morgan's theorem.

e) What are the advantages and disadvantages of using recursive functions?

f) What do you understand by base or radix?
Explain with example.

g) Explain Algorithms and Flowcharts in regards of problem solving.

[Turn over]

h) "Multiple bus architecture is better than single bus architecture"– Justify the statement.

i) Find the value of base B, where $(452)_B = (1106)_{10}$.

j) How negative numbers are represented in Binary system?

k) Perform binary arithmetic operation on 8-bit numbers using 2's complement notation $(-45+23)$.

l) Find the 9's complement and 10's complement of 789.

m) Find the output of the following snippet considering all the header files are properly included:

```
int a = 5;
```

```
while(a++>0);
```

```
{
```

```
    printf("%d", a);
```

```
}
```

n) What is pre-processing? Explain with example.

o) Is *main()* a predefined function?–Justify your answer.

2. Answer any **four** questions: $5 \times 4 = 20$

a) Differentiate between automatic, external, register and static variables. Design a function to search an element in a 1-D array. $3+2$

b) What is the difference between data and information? What is an inverter? Design a function to add all the elements of an array. $3+2$

c) Represent the decimal number 4523 in

i) BCD

ii) Excess-3

iii) Gray Code $1\frac{1}{2} + 1\frac{1}{2} + 2$

d) Explain Parity. How Parity is used to detect single bit errors? Design a logical diagram for any parity bit generator and checker. $1+1+3$

e) Minimize $F = x'y'z + z'yz + xy$ using Boolean arithmetic. Realize the minimized function using only NAND gate. $2+3$

f) Design a function to swap two numbers. Explain call by value and call by reference with examples. $2+3$

3. Answer any **two** questions: $10 \times 2 = 20$

a) Draw and explain the logical diagram of DRAM. Draw and explain Memory Hierarchy in a

computer system. What is working of CPU bus?

What are the different types of CPU buses?

3+2+2+3

- b) What do you mean by operator precedence and associativity? What is type casting and type conversion? Explain the syntax and working of conditional operator with example. Convert the following code into a conditional statement:

```
If(a>b){  
    If(a>c){  
        max=a;  
    }  
    else{  
        max=c;  
    }  
}  
else{  
    If(b>c){  
        max=b;  
    }  
    else{  
        max=c;  
    }  
}
```

2+2+3+3

c) Write a program to store 10 student records each having student name and roll number into a binary file. 10

d) Answer any two of the following: $5 \times 2 = 10$

i) Differentiate between Machine Level, Assembly and High Level Languages.

ii) Minimize using K-map

$$F = ABC'D' + ABC'D + AB'C'D + ABCD \\ + AB'CD + ABCD' + AB'CD'$$

Realize the optimized function using any universal logic gate.

iii) Indexed Sequential Files.

iv) Direct Memory Access (DMA).