

U.G. 1st Semester Examination - 2021

COMPUTER SCIENCE

[HONOURS]

Course Code : COM.SC-H-CC-L-101

(Computer Fundamentals and Programming Using C)

Full Marks : 60

Time : $2\frac{1}{2}$ 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: $2 \times 10 = 20$
- a) What are the differences between system software and application software?
 - b) How negative numbers are represented in binary system?
 - c) Find the complement of $F = ABC' + BC + A'B'C$.
 - d) Perform binary addition using 2's complement notation: $-32 + 40$.
 - e) Find the value of base b where $(110)_b = (452)_{10}$.
 - f) Find the 9's complement and 10's complement of 99.

[Turn over]

- g) What is the difference between `#include<stdio.h>` and `#include"stdio.h"`?
- h) What are the differences between type casting and type conversion?
- i) Find the output of the following snippet considering all the header files are included properly:

```
int main()
{
    unsigned int i=10;
    while(i-->= 0)
        printf("%u, ",i);
    printf("\n");
    return 0;
}
```

- j) What is pre-processing? Explain with an example.
 - k) Predict the output of the following snippet considering all header files are included properly:
- ```
int main()
{
```

```

int a[10]={1,4,1,1,1,1,1,1,1,1};

printf("%d",*(a+1)-(*a+3));

return 0;

}

```

- l) What are the advantages and disadvantages of using recursive functions?
- m) State the differences between compiler and interpreter.
- n) Differentiate between auto and register type of variables in C.
- o) Write the output of the following snippet:

```

#include <stdio.h>

int main()

{

 typedef struct tag {

 char str[10];

 int a;

 } har;

 har h1, h2 = {"I Help", 10};

 h1 = h2;

 h1.str[1] = 'h';

```

```

printf("%s, %d", h1.str, h1.a);

return 0;

}

```

2. Answer any **four** questions : 5×4=20

- a) Minimize the following boolean function  $F(A,B,C,D) = \Sigma (0,1,2,3,7,8,9,10)$  using K-map. Realize the minimized function using any universal gate. 3+2

- b) Represent the number  $(1211)_{10}$  into  $1\frac{1}{2} + 1\frac{1}{2} + 2$

- i) BCD
- ii) Excess -3
- iii) Gray Code

- c) 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

- d) What is the ternary operator in C? Convert the following if...else block to a conditional statement using ternary operator:

```

if(a>b){

 if(a%2 == 0){

 x = b *a;
 }
}

```

```

}
else{
 x += a;
}
} else{
 x *=b;
}

```

2+3

e) Write a C program to copy the content of one file into another. 5

f) Design a function to find the sum of diagonal elements of a 3×3 matrix. Function will take pointer to the matrix as an argument and return the value of the sum. 5

3. Answer any **two** questions : 10×2=20

a) i) Perform  $0.6 + (-0.25)$  using floating point arithmetic.

ii) How errors are detected using hamming code? Explain using an example.

3+(4+3)

b) i) Simplify the following boolean expression:  $F = (A+B)(A+B')(A'+C)$

ii) Why NAND is known as universal gate?

iii) What are the differences between identifiers and variables?

iv) What are the differences between normal variable and static variable in C?

3+3+2+2

c) i) What is function header?

ii) Design a function that takes an integer array and an integer number as an argument and returns the occurrence of the given integer number in the array.

iii) Write a program to find the GCD and LCM of two numbers. 1+3+(3+3)

d) i) What are the different file opening modes in C?

ii) Write a C program to merge the contents of two files into a single file using command line arguments. 4+6

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