

Register No.: ..... Name: .....

## SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER B.TECH DEGREE EXAMINATION (Special), AUGUST 2021

Common to all branches

Course Code: 20EST102

Course Name: Programming in C

Max. Marks: 100

Duration: 3 Hours

### PART A

*(Answer all questions. Each question carries 3 marks)*

- |   | CO  |
|---|-----|
| 1. With suitable diagram explain memory hierarchy with respect to speed, size and cost. | [1] |
| 2. Compare with examples compilers and interpreters.                                    | [1] |
| 3. Differentiate identifiers and keywords with respect to their use in C language       | [2] |
| 4. What is the out put of the following code.   |     |

```
#include<stdio.h>
```

```
void main()
```

```
{
```

```
    int p,q=0;
```

```
    p=q;
```

```
    while(q>=0)
```

```
    { p++;
```

```
        switch(p)
```

```
        {
```

```
            case 0: q++;
```

```
            case 1: q+=p;
```

```
            case 4: p*=q;
```

```
                break;
```

```
            default:q-=p;
```

```
        }
```

```
        printf("%d %d\t",p,q);
```

```
    }
```

```
}
```

- |  |     |
|--|-----|
| 5. With suitable examples illustrate the use of strcat and strcpy in C | [3] |
|--|-----|

6. Write a C program to find transpose of a matrix. [3]
7. Describe the output generated by the following program [4]
- ```
#include<stdio.h>
int a=3;
fun(int x)
{ a+= x;
return(a);
}
void main()
{ int i;
for(i=1;i<=6;++i)
{ a=fun(i);
printf(“%d”,a);
}
}
```
8. Explain the concept of nested structure with an example. [3]
9. How can you perform read and write operations in an unformatted data file [6]
10. What does variable ‘a’ specifies in the following declarations [5]
- char \*a
  - int \*a[10]

### PART B

*(Answer one full question from each module, each question carries 14 marks)*

#### MODULE I

- |     |                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>CO</b> | <b>Marks</b> |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 11. | a) Frederic, a high school teacher has the total marks of his 40 students in the year end examination. The school management has decided to put the top 20 of Frederic’s students in one division and the rest in another division for the upcoming year. Write an algorithm to help Frederic to allocate students to each division based on the criteria. Explain to Frederic the procedure adopted for solving the problem. | [1]       | (9)          |
|     | b) What are pseudo codes? Write pseudo code to find greatest common divisor of two numbers.                                                                                                                                                                                                                                                                                                                                   | [1]       | (5)          |

#### OR

- |     |                                                                     | <b>CO</b> | <b>Marks</b> |
|-----|---------------------------------------------------------------------|-----------|--------------|
| 12. | a) Explain Structural approach with its advantage and disadvantage. | [1]       | (5)          |
|     | b) Develop a pseudo code and a flow chart for Linear Search.        | [1]       | (9)          |

#### MODULE II

- |     |                                                                          | <b>CO</b> | <b>Marks</b> |
|-----|--------------------------------------------------------------------------|-----------|--------------|
| 13. | a) Write a program in C to print Armstrong numbers between 100 and 5000. | [2]       | (10)         |

- b) Find the output of the following code:

```
#include <stdio.h>
void main()
{
    int i, j, var = 'A';
    for (i = 5; i >= 1; i--) {
        for (j = 0; j < i; j++)
            printf("%c ", (var + j));
        printf("\n");
    }
}
```

[ 2] (4)

OR

- |     |                                                                      | <b>CO</b> | <b>Marks</b> |
|-----|----------------------------------------------------------------------|-----------|--------------|
| 14. | a) Explain Loops and Discuss about various loops in C with examples. | [2]       | (6)          |
|     | b) Develop a C program to check the given string is Palindrome.      | [3]       | (8)          |

### MODULE III

- |     |                                                                                                                                                                                         | <b>CO</b> | <b>Marks</b> |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 15. | a) Write a C program to read two string and merge them into a single string without using library function.                                                                             | [3]       | (8)          |
|     | b) Find and explain the output of the following program                                                                                                                                 |           |              |
|     | <pre>#include&lt;stdio.h&gt; void main() {     int i;     int arr[5] = {1};     for (i = 0; i &lt; 5; i++)     {         arr[i+1]+=arr[i];         printf("%d ", arr[i]);     } }</pre> | [3]       | (6)          |

OR

- |     |                                                                                                                 | <b>CO</b> | <b>Marks</b> |
|-----|-----------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 16. | a) Write a C program to print the largest and smallest element in an integer array.                             | [3]       | (8)          |
|     | b) Define string. How string is declared and initialized? Explain string input/output functions with an example | [3]       | (6)          |

### MODULE IV

- |     |                                                                                                                                                                                | <b>CO</b> | <b>Marks</b> |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 17. | a) What is a structure? How is a structure member accessed? Explain with an example                                                                                            | [3]       | (6)          |
|     | b) Write a program in to find whether a number can be represented as sum of two prime numbers using a function checkPrime(n), which returns 1 if n is prime and 0 if n is not. | [4]       | (8)          |

OR

|     |                                                                                                                                                                                                                                                                                                                                                                           | <b>CO</b> | <b>Marks</b> |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 18. | a) Write a program in C using recursion to print the following series:<br>100 200 400 800 800 400 200 100                                                                                                                                                                                                                                                                 | [4]       | (8)          |
|     | b) Describe the output of the following code<br><pre>#include&lt;stdio.h&gt; void fun(int arr[], arr_size) {     int i;     for (i = 0; i &lt; arr_size; i++)     {         arr[i] = i;     } }  void main() {     int i;     int arr[4] = {0, 0 ,0, 0};     fun(arr, 4);      for(i = 0; i &lt; sizeof(arr)/sizeof(arr[0]); i++)         printf(" %d ", arr[i]); }</pre> | [4]       | (6)          |

#### MODULE V

|     |                                                                                                              | <b>CO</b> | <b>Marks</b> |
|-----|--------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 19. | a) Write a program in C to find the largest element of a one-dimensional array using the concept of pointers | [5]       | (7)          |
|     | b) Explain file handling in C with a program to create a text file and display its contents on the screen.   | [6]       | (7)          |

#### OR

|     |                                                                                                                                                                                                                         | <b>CO</b> | <b>Marks</b> |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|
| 20. | a) Differentiate between sequential files and random access files                                                                                                                                                       | [5]       | (4)          |
|     | b) Explain the functionality provided by the following functions.<br><ul style="list-style-type: none"> <li>i) rewind()</li> <li>ii) fread()</li> <li>iii) fwrite()</li> <li>iv) fseek()</li> <li>v) ftell()</li> </ul> | [6]       | (10)         |

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