PES University, Bengaluru

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END SEMESTER ASSESSMENT (ESA) - JULY - 2023

UE21CS141B - Problem Solving With C

Total Marks : 100.0

1.a. Explain the phases involved in the Program development Life cycle with a neat diagram .(6M) (6.0 Marks)

1.b.) i) Given a C program named p1.c, write the command used to compile and link p1.c. (2M)
ii) State true or false: continue is an unconditional control construct, which takes the control to the next iteration of the enclosed loop. (2M)
iii) Identify the compile time (if any) and link time errors (if any) in the below code. If there are no errors, write the expected output. (4M)

```
#include<stdio.h>
int main()
{
int a=2,
int b=3;
int *p1=&a;
int *p2=&b;
Print("%d+%d=%d\n",a,b,*p1+*p2);
}
```

(8.0 Marks)

1.c. Write the syntax of if-else statement with a sample. (6M) (6.0 Marks)

2.a. Mention any 4 characteristics of an array. How array Declaration is done? (6M)
(6.0 Marks)

2.b. Write the user defined recursive function to find the factorial of a number. (6M)
(6.0 Marks)

2.c. The below function emulates the strcat() in string.h. Complete the function by filling the missing code lines. (4M)

```
void my_strcat(char* a, char* b)
{
while (*a)
//code1 - 1 Marks
while(*b)
{
//code2 - 1 Marks
a++;
//code3 - 1 Marks
}
//code4 -- 1 Marks
}
```

(4.0 Marks)

2.d. Bring out the differences between arrays and pointers. (4M) (4.0 Marks)

3.a. List any two functions related to dynamic memory allocation using C. Explain anyone with a code snippet. (6M)

(6.0 Marks)

3.b. Declare a structure called employeewith the following fields.
Id, name, designation,salary.Choose appropriate data type for each field.
Give an alias name called EMPLOYEEfor the defined structure.
Declare a variable capable of holding maximum 100 employee details.(4M)

(4.0 Marks)

3.c. List different types of queue. (4M) (4.0 Marks)

3.d. write a c program to perform matrix addition. (6M) (6.0 Marks)

4.a. Choose a correct statement about C file operation program.? (4M)

```
int main()
{
   FILE *fp;
   char ch;
   fp=fopen("readme.txt","r");
   while((ch=fgetc(fp)) != EOF)
   {
      printf("%c",ch);
   }
}
```

A) FOPEN opens a file named readme.txt in Read Mode ("r).
B) EOF is End Of File. ch==EOF checks for end of file and while loop stops or exits.
C) FGETC(fp) is a function that returns one character and cursor goes to next character.
D) All the above

(4.0 Marks)

4.b. Implement Binary search using recursive method on an array of 100 integer elements which are stored in ascending order. Handle both successful and unsuccessful search.
Given the array, int a[ ] = {100,98,76,54,44,43,42,40,31,30};
(8M) (8.0 Marks)

4.c. write a simple callback program for addition and multiplication. (8M)

(8.0 Marks)

5.a. What will be the output of the following C code? (4M)

```
#include<stdio.h>
enum colour
{
   blue, red, yellow
};
main()
{
   enum colour c;
   c=yellow;
   printf("%d",c);
```

a)1
b) 2
c) 0
d) Error

(4.0 Marks)

5.b. Describe any three differences between structure and unions in C. (6M)

(6.0 Marks)

5.c. **Say True or False (4M)**
i) Array of bit fields is allowed
ii) Bit fields with a length of 0 must be unnamed
iii) Accessing the Variable length Arguments from the function body makes use of macros available in stdarg.h
iv) Storing the symbol of one enum in another enum variable is invalid in C.
(4.0 Marks)

5.d. Write a C program with six pre-defined macros(FILE, DATE, TIME, STDC_VERSION, STDC, LINE) . (6M) (6.0 Marks)