भारतीय सूचना प्रौद्योगिकी संस्थान भागलपुर

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY BHAGALPUR

(An Institute of National Importance under Act of Parliament)

Department of Computer Science and Engineering

End Semester Examination, July-Dec 2024

Branch: B. Tech (CSE) | **Semester: 1st**

Course Name: Computer Programming | **Course Code: CS101**

Maximum Time: 3 hours | **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Assume any suitable data, if necessary. (Any other instruction need to provide by the concerned faculty)

Q 1.	**(i) Explain what would be the output of the following code snippet:**
	int a=11, b=5, c;
	c=b<a && printf("**HITBH**");
	printf("%d", c+1);
		(vi) What would be the output of the following code snippet:
		for (int j=0; j<=10; j++)
		{
		if(j%2==0) break;
		printf("%d", j+1);
		}
			1×10= 10 marks

	(ii) If the arithmetic operators are right-to-left associative, then what is the output of the following expression:
	int a=5+2-6+10×5/6+8-15;
	printf("%d %d %d", a, a++,++a);
		(vii) What is the output of this C program?
		char ab [] ="**IIITBHAGALPUR2024**";
		int *p=&ab;
		p=p+3;
		printf("%c\n", *(++p));	

	(iii) What does the following program print?
	int a=24, b=3;
	if (5/6)
	printf("%d %d", a<<b, b>>1);
	else
	printf("%d %d", ~a, a^b);
		(viii) Use the ternary operator to rewrite the logic of the following if-else block.
		if(a>b)
		b=a;
		else
		a=b;	

	(iv) Evaluate the following expressions: a + 2 > b ||' c && a = = d *a – 2 < = e Where a=11, b=6, c=0, d= 7 and e=5.	**(ix)Transform binary into hexadecimal.** $(10101011110011011111101111)_2$=(……)$_{16}$	

	(v) Evaluate the output for the below C program.
	main ()
	{
	int i;
	i = 1, 2, 3;
	printf ("%d", i);
	}
		(x) Evaluate the output for the below C program.
		main (){
		char *s [] = {"knowledge","is","power"};
		char **p;
		p = s;
		printf("%s ", ++*p);
		printf("%s ", *p++);
		printf("%s ", ++*p);
		}	

Q 2.	Write a C program to implement the concept of self-referential structure using single and multiple link.		**5 marks**
Q 3.	What is the importance of file handling in C Programming? Further, discuss the various file operations in C such as (a) input (b) Output (c) Error streams.		**5 marks**
Q 4.	What is advantages of using function? Explain different classification of user defined functions based on parameter passing and return type with examples		**1+5= 6 marks**

Q 5.	Develop a C program to generate the Pascal triangle, and draw the flowchart diagram for the given program. 	**3+3= 6 marks**
Q 6.	What is limitations of Single dimension array. Further, write a C program to multiply two matrices using recursive approach. Find the value C=A×B. $A=\begin{bmatrix}6 & 7 & 8\\ 9 & 10 & 2\\ 0 & 0 & 1\end{bmatrix}$ $B=\begin{bmatrix}2 & 3 & 4\\ 6 & 5 & 0\\ 1 & 0 & 1\end{bmatrix}$	**1+5= 6 marks**

Q 7.	**Find the output of the following C program**
	int main ()
	{
	char c [] ="**IIITBHAGALPUR2024**";
	int *p=&c;
	printf("%s\n", c+4);
	printf("%d\n", *(c+4));
	printf("%c\n", *(c+5));
	printf("%s\n", p+2);
	printf("%c\n", *(p+2));
	printf("%s\n", c+c[3]-c[1]);
	p=p+3;
	printf("%c\n", *(++p));
	return 0;
	}
		6 marks

Q8.	**Write the short notes on any three points.** (i) Call by value **Vs** Call by reference (ii) Iterative **Vs** Recursive approach (iii) Linear Search **Vs** Binary Search (iv) Insertion Sort **Vs** Selection Sort	**6 marks**

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(An Institute of National Importance under Act of Parliament)

Department of Computer Science and Engineering

Mid Semester Examination, July-Dec 2024

Branch: B. Tech (CSE/ECE/MAE/MNC)
Course Name: Computer Programming
Maximum Time: 2 hours

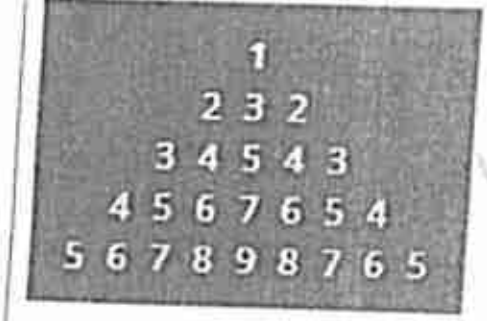
Semester: 1st
Course Code: CS101
Max. Marks: 30

Instruction:

1. Attempt all questions.
2. Assume any suitable data, if necessary. (Any other instruction need to provide by the concerned faculty

Q 1.	What will be the output of following program codes? Explain your answer.
	(a) main ()
	{
	int a [5] ={1,2,3,4,5};
	a[2]=4[a]+~(a[3]);
	printf ("%d %d %d", a[1], 2[a], ~(a[4]));
	}
	
	(b) main ()
	{
	signed int x = -42;
	printf ("%d", x<<2);
	printf ("%d", x>>3);
	printf ("%d", (x << 1) + (x >> 1));
	}
	
	(c) main ()
	{
	int a =22, b=-17;
	printf ("%d %d %d", ~(-a), a&b, b/a);
	printf ("%d %d", a^b, a&&b);
	}
	
	(d) void get (int n)
	{
	if (n<1) return;
	get (n-1);
	get(n-3);
	printf ("%d", n);
	}
	If get (6) function is being called in main () then how many times will the get () function be invoked before returning to the main ()?
	
	(e) main ()
	{
	int x, y=10, z;
	x=9>8>7;
	z=5==10;
	while(y>x)
	{
	printf ("%d %d\n", ++x, x++);
	if(x==10)
	break;
	z++;
	}
	printf ("%d", z);
	}
	
	(f) void fun1 (int n)
	{
	static int d=1;
	printf ("%d %d", n, d);
	d++;
	if (n>1)
	fun1 (n-1);
	printf ("%d", d);
	}
	main ()
	{
	fun1 (3);
	}
		6×1=
		6 marks

Q 2.	(a) Differentiate among compiler, interpreter, and assembler. (b) What is difference between recursive and iterative approaches?	2+2= 4 marks
Q 3.	(a) What is an array? How a single dimension and two dimension arrays are declared and initialized? (b)What is function? Explain different classification of user defined functions based on parameter passing and return type for identifying the given number is palindrome or not.	2+3= 5 marks

Q 4.	Write a C program to print the bellow pattern, and draw the flowchart diagram for this program.  	2+3= 5 marks
Q 5.	Write a program to read the string in the form of first name, middle name, and last name and print the complete name in the first name. First Name= "Computer" Middle Name= "Science" Last Name= "Engineering" Complete Name= "Computer Science Engineering"	5 marks
Q 6.	Implement the Binary Search algorithm for identifying the key element is present or not in the array using iterative and recursive approaches.	5 marks

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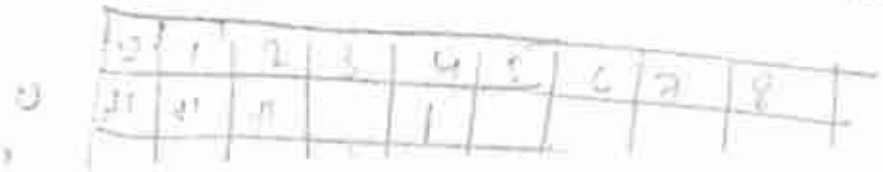

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INDIAN INSTITUTE OF INFORMATION TECHNOLOGY BHAGALPUR

(An Institute of National Importance under Act of Parliament)

Department of Computer Science and Engineering

End Semester Examination, December_2023

Branch: B. Tech (CSE) | **Semester: 1st**

Course Name: Computer Programming | **Course Code: CS101**

Maximum Time: 3 hours | **Max. Marks: 50**

Instruction:

1. Attempt all questions.
2. Assume any suitable data, if necessary. (Any other instruction need to provide by the concerned faculty)

<table>
<tr><td>Q 1.</td><td colspan="2">(a) Discuss the various file operations in C such as (a) input (b) Output (c) Error streams.
(b) How to declare and access the object of structure with suitable example.</td><td>2×2=4 marks</td></tr>
<tr><td rowspan="3">Q 2.</td><td>(i) What is printed by the following C Program?
main ()
{
int a [3][3][3] = {1,2,3,4,5,6,7,8,9,10,11,12,13, 14,15,16,17,18,19,20,21,22,23,24,25,26,27};
int i=0, j=0, k=0;
for (i=0; i<3; i++)
{
for (k=0; k<3; k++)
printf("%d", a[i][j][k]);
printf("\n");
}
}</td><td>(iv) Find the output of the following C program
main ()
{
int i=0, count=0;
for (int j=-3; j<=3; j++)
{
if(j>=0) &&(i++))
count=count+j;
}
count=count+i;
printf("%d", count);
}</td><td rowspan="3">1×6=6 marks</td></tr>
<tr><td>(ii) Find the output of this C program
main ()
{
int a [] = {2,4,6,8,10};
int i, sum=0;
*b=a+4;
for (i=0; i<5; i++)
sum=sum+(*b-i)-*(b-i);
printf("%d ",sum);
}</td><td>(v) What is the value printed by the following C program?
main ()
{
int a [] = {1,2,3,4,5,6,7,8,9,0,1,2,5};
*ip=a+4;
printf ("%d \n", ip[1]);
}</td></tr>
<tr><td>(iii) What does the following program print?
void fun1(int *p, int*q)
{
p=q;
*p=2;
}
int i=0, j=1;
main ()
{
fun1(&i, &j);
printf("%d %d\n", i, j);
}</td><td>(vi) Consider the following C program. The return value of fun (5) is ————
main ()
{
int x=1, k;
if(n==1) return x;
for (k=1; k<n; ++k)
x=x + fun (k)*fun (n-k);
return x;
}</td></tr>
</table>

Q 3.	Explain the concept of Pointer. Further, write a program in C to count the number of vowels and consonants in a string using a pointer. The input string= "**Indian Institute of Information Technology Bhagalpur**"	1+4=5 marks
Q 4.	Implement the insertion sort algorithm in a C language. Further, apply the insertion sort on the given input such as: **12, 8, 5, 16, 20, 6, 2, 9, 19, 23, 2, 4, 6.**	3+2=5 marks
Q 5.	Why loop concept is important in C language. Further, write a C program to print the below pattern, and draw the flowchart diagram for the given program. 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5	1+2+2= 5 marks
Q 6.	Implement the Binary Search Algorithm in C programming language using recursion. Further, differentiate between the linear search and binary search in detail.	3+2=5 marks
Q 7.	**Describe the concept of Function. Further, write a C program for calculating the factorial of any number using the following operation such as:** (i) With arguments and no return value (ii) With arguments and return value (iii) Without arguments and no return value (iv) Without arguments and return value	1+4= 5 marks

Q8.	**Find the output of the following C program**
	int main ()
	{
	char c [] ="**IIITBHAGALPUR2024**";
	int *p=&c;
	printf("%s\n", c+4);
	printf("%d\n", *(c+4));
	printf("%c\n", *(c+5));
	printf("%s\n", p+2);
	printf("%c\n", *(p+2));
	printf("%s\n", c+c[3]-c[1]);
	p=p+3;
	printf("%c\n", *(++p));
	return 0;
	}
		5 marks

Q9.	**Write a C program to perform the various operation on string such as** (i) Comparison of two strings (ii) Concatenation of two strings (iii) Calculate the length of string	5 marks
Q10.	**Write the short notes on any three points.** (i) Call by value Vs Call by reference (ii) Iterative functions (iii) Tail recursion (iv) Double pointer (v) Decision making statements	5 marks

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Indian Institute of Information Technology Bhagalpur
Department of Computer Science & Engineering
Computer Programming (CS-101)
End Semester, Date: 2nd December, 2023

Timing: 10:00 AM to 1:00 PM | Semester-I (ECE + MAE+ MnC) | Max mark: 50

Answer all questions

1. (a)
```
int done(int x){
if(--x) return (--x + done(x));
else return -1;}
int main(){
printf("%d", done(5));
return 0;}
```

what will be output. **(1)**

(b)
```
void hello(int b[][3])
{++b;
b[1][2]=90;
}
int main(){
int a[3][3]={{1,2,3}, {4,5,6},{7,8,9}};
hello(a);
printf("%d", a[2][1]);
return 0;}
```

what will be output. **(1)**

(c)
```
int main(){
int i,j;
for(i=10,j=2; --i; i=i/j)
printf("\n IIIT Bhagalpur");
return 0;}
```

What will be output. **(1)**

(d)
```
int main(){
int i;
float sum=0;
auto float x[5]={9.8, 7.6, 5.4};
for(i=0;i<5;i+=2)
sum+=x[i];
printf("%f", sum);
return 0;
}
```

What will be output. **(1)**

(e)
```
typedef struct{
char *s;
int a;
}stud;
int main(){
stud s1, *s2;
s1.s="IITBGP\n";
s2=&s1;
s2->a=strlen(s2->s);
printf("%d", (*s2).a);
return 0;
}
```
(1)

What will be the output.

(f)
```
int main(){
int matrix[3][3]={10,20,30,40,50,60,70,80,90};
printf("%d", **(matrix+1)+1);
return 0;}
```
(1)

What will be the output.

(g)
```
int main(){
char s1[]="I am a good boy";
puts(s1+1);
return 0;}
```
(1)

What will be the output.

(h)
```
int cal(int x){
if(!x) return 1;
return (x+cal(x-1));}
int main(){
printf("%d", cal(2)+cal(3));
return 0;}
```
(1)

What will be the output.

(i)
```
int sum;
int main(){
int a[]={1,2,3,4,5};
sum=sum+a[1]+a[2];
printf("%d", sum);
return 0;}
```
(1)

What will be the output.

(j)
```
void fun(int b){
b+=b;}
int main(){
static int a[]={10,20,30,40,50,60};
int *b=&a[4];
fun(*b);
```

```
fun(*b):
printf("%d", *b);
return 0;}
```

What will be the output.

2. Write a C program that reads the following information of each student in a class. **(1)**

   - Name of the student
   - Roll number
   - Date of Birth
   - 5 subject marks

   Perform the following operations using *different user defined functions.*

   (a) Find the name and roll no. of the topper of the class.

   (b) Find the name of the students obtaining highest mark in each subject.

(10)

3. (a) Write a C program to write *"n"* numbers into a file *(input.dat)*. Read the same file and find the average of odd numbers and average even numbers of that file. **(5)**

   (b) Let A be an array of integers having size *"n"*. Write a *recursive* C program to compute the maximum element of the array.

(5)

4. Write a C program to input two strings (*S1 and S2*) and perform the following operations.

   (a) Perform *left concatenation* using user defined function.

   (b) *Reverse* the strings *S1* using user defined function.

(10)

5. (a) Write a C Program to check whether the input matrix (square) is a *lower triangular* or not. If the input matrix is a *lower triangular* matrix, then find the sum of of its elements. Don't include $0's$ at the time of finding sum because it unnessesary takes large amount of computing time.

(5)

   (b) What is difference between call by value and call by reference. What a C program to swap two numbers (integers) using the concept of *call by reference.* **(5)**

Best wishes

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Department of Computer Science and Engineering

Mid Semester Examination, Oct 2023

Branch: B. Tech (CSE) | **Semester: 1st**

Course Name: Computer Programming | **Course Code: CS101**

Maximum Time: 2 hours | **Max. Marks: 30**

Instruction:

1. Attempt all questions.
2. Assume any suitable data, if necessary. (Any other instruction need to provide by the concerned faculty)

<table>
<tr><td>Q 1.</td><td>(a) Describe the term Compiler, Assembler, and Interpreter along with suitable example.
(b) What is meant by operator precedence in C. What are the relative precedence of the bit wise and arithmetic operators?
(c) Compare the use of the if-else statement with the use of ?: operator. In particular, in what way the ? : operator be used in the place of an if-else statement.</td><td>3×2=6 marks</td></tr>
<tr><td rowspan="3">Q 2.</td><td>(i) How many times Hello will be printed?
1. double k = 0;
2. for (k = 0.0; k < 3.0; k++)
3. {
4. printf("Hello");
5. }</td><td>(iii) Find the output of the following C program
1. unsigned int num =4;
2. for (int j=0; j<16; j++)
3. {
4. printf("%d", (num<<j, & 1<<15)? 1:0);
5. }</td><td rowspan="3">7 marks</td></tr>
<tr><td>(ii) Find the output of this C program
1. i=20, k=0;
2. for (j=1; j<i; j=1+4*(i/j))
3. {
4. k+=j<10 ? 4 : 3;
5. }
6. printf("%d %d %d",i ,j ,k);</td><td>(iv) Find the output of the following C program
1. int a = 10;
2. a = -a;
3. printf ("%d %d %d\n", a, a<<1,a>>1);

(V) Find the output of the following C program
1. signed int x = -2;
2. printf ("%d", x<<1);
3. printf ("%d", x>>1);
4. printf ("%d", (x << 1) + (x >> 1));</td></tr>
<tr><td>Q 3.</td><td>Explain Conditional operator (?:). Find the output of the following C program
int x;
x=5 > 2 ? 4 > 1 ? 5>7 ? 10 : 5 > 8 ? 6 > 2 ? 20 : 70 : 5 > 6 ? 25 : 14 : 7 > 2 ? 32 : 41 : 8 > 9 ? 23 : 46 ;
printf("%d",x);</td><td>2 marks</td></tr>
<tr><td>Q 4.</td><td>Write a program to transform the decimal number into binary number.
For example: $(13)_{10}$ to (1101)2</td><td>3 marks</td></tr>
<tr><td>Q 5.</td><td>First, differentiate between the operator and operand. Further, describe the different types of operators that are included in C language with suitable example.</td><td>4 marks</td></tr>
<tr><td>Q 6.</td><td>Write a program in C that generates every 3rd integer between 2 and 1000 and calculates the sum of those integers that are divisible by 2 and 3? Draw the flowchart diagram for this program also.</td><td>4 marks</td></tr>
<tr><td>Q 7.</td><td>Write a C program to input electricity unit charges and calculate total electricity bill according to the given condition:
For first 50 units Rs. 0.50/unit
For next 100 units Rs. 0.75/unit
For next 100 units Rs. 1.20/unit
For unit above 250 Rs. 1.50/unit
An additional surcharge of 20% is added to the bill</td><td>4 marks</td></tr>
</table>

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INDIAN INSTITUTE OF INFORMATION TECHNOLOGY BHAGALPUR

CS101 [Computer Programming],

Autumn 2022-23, End Semester Examination, CSE

Time: (180 minutes), Full marks: 50

INSTRUCTIONS:

- Attempt all questions.
- Marks for each question is mentioned.

1) **2+2+4+2**

A) What is stored program computer? What is the role of control unit in a computer system.

B) Draw a flow chart to find the Fibonacci series up to n term, given by the user.

C) Why C is called a mid-level language?

2) **(4*1)+2+2+2**

A) Find the value of j, for different values of i (i=2, i=4, i=16, i=1).

```
switch (i)
{
 case 2:  i = i * i;
 case 4:  i = i * i;
 default: i = i * i;
 break;
 case 16: i = i * i;
}
j=i;
```

B) Write the possible output of the followings:

```
#define m 5+5
const int n = 5+5;
main()
{
int a=0, b=0;
a=m*m;
b=n*n;
printf("%d%d", a,b);
}
```

```
#define n 5
void main()
{
int a[n], i;
 a[0]=1;
for(i=0;i<n-1;++i) {
a[a[i]]=a[i]+1; }
for(i=0;i<=n-1;++i) {
printf("%d", a[i]); } }
```

C) Write the equivalent statements using while loop for the following statements

```
for (k = 2; k <= sqrt(n); k += 3)
printf("%d ", k);
```

3) **2+2+3+2+1**

A) Write a C program to print the size of different data types (int, char, float)

B) When recursion causes an infinite looping? Give example.

C) Write a C program to compute factorial of a given number using recursion.

D) What is the role of return statement in C function?

E) What is function prototype?

4) **4+1+2+1+2**

A) Write the output of the following program.

```
int main()
{
int i = 1, j = 1, k = 1, count = 0;
while (i < 2) {
for(; j < 4; j += k)
do {
++count;
k += i;
} while (k < 8);
i += j;
}
printf(" %d %d %d\n", i, j, k);
printf("Number of iterations = %d\n", count);
return 0;
}
```

B) What is structure? How it is declared, write the syntax? How the members of a structure is accessed? What is self-referential structure, Give Example.

5) **1+1+4+2+2**

A) What is pointer to pointer? What is void pointer? Write a C program to find the maximum value present in an integer array using pointer. What is pointer type casting Give example.

B) Find the output of the following program:

```
void funcn(int a[], int n)
{
int i;
for (i = 0; i < n - 1; ++i)
a[i] += a[i+1];
}
int main () {
int a[5] = {1, 2, 4, 6, 8};
funcn(a, 4);
printf("%d", a[4] - a[3]);
return 0;
}
```