

```

k = &a;
j = (float *) k;
printf ("\n %f", *j);
}

```

- (a) 20.0 (b) 10.0 (c) compilation error (d) 0.0.

- (v) What will the following program segment produce?
void junk (int i, int *j)

```

{
i = *j * *j;
*j = i * i;
}

```

```

void main ( )
{

```

```

int i = 5, j = 2;
junk (i, &i);
printf( "%d, %d", i, j);
}

```

- (a) 4, 25 (b) 25, 4 (c) 625, 2 (d) 625, 25.

- (vi) Consider the following declaration:

```

union id {
char color;
int size;
};
struct st {
char country[10];
union d;
} flag;

```

To assign a color to a flag, the correct statement is:

- (a) flag.color = 'WHITE'; (b) flag.d.color = 'W';
(c) flag.color = 'W'; (d) flag.d.color = 'WHITE';

- (vii) Which of the following statements are FALSE about the following code?

```

int main(int ac, char *av[ ])
{
}

```

- (a) *ac* contains count of arguments supplied at command-line.
(b) *av[]* contains addresses of arguments supplied at a command line.
(c) In place of *ac* and *av*, *argc* and *argv* should be used.
(d) The variables *ac* and *av* are always local to main().

7. (a) What is the difference between `const char* p` and `char const* p`?
(b) What is dynamic memory allocation? Write the different dynamic memory allocation functions in C.
(c) Write a C program that
i) implements string copy operation using a function, `STRCOPY(str1, str2)` that copies a string `str1` to another string `str2` without using library function.
ii) reads a sentence and prints frequency of each of the vowels and total count of consonants.

$$2 + (1 + 1) + (4 + 4) = 12$$

Group - E

8. (a) Explain the role of C pre-processor. What is macro and how is it different from C variable name?
(b) Define a structure called 'employee' to store information of an employee (*e_no*, *e_name*, *basic_pay*, *DA*, *HRA*, *gross_pay*). Write a program in C to input the *e_no*, *e_name* and *basic_pay* of several employees. The program will calculate the *DA*=67% of basic, *HRA*=15% of basic and *gross_pay* = *basic* + *DA* + *HRA* of all employees and display the details of the employee having the highest salary.
(c) What is union? How does the union differ from a structure?

$$(2 + 2) + 6 + (1 + 1) = 12$$

9. (a) Explain how the structure variable can be passed as a parameter to a function with example.
(b) Write a C program to delete a specific line from a text file.
(c) Explain the following with example:
i) Array within structure.
ii) Structure within structure.

$$2 + 6 + (2 + 2) = 12$$

MCA/1ST SEM/MCAP 1102/2016
INTRODUCTION TO PROGRAMMING
(MCAP 1102)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as
practicable.*

Group - A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) For the statement below, assume that $x=50$ before execution of the statement. Find, what is the value of y after execution?
 $y = x = x++;$
(a) 0 (b) 1 (c) 51 (d) 50.
- (ii) The output of the following program would be:
for ($i=1; i \leq 5; i++$)
{
 if ($i \% 2$)
 continue;
 printf("%d ", i);
}
- (a) 2 4 (b) 1 3 5
(c) 1 2 3 4 5 (d) blank (i.e., no output).
- (iii) If a two dimensional array $\text{int } a[10][20]$ is represented as an array of pointers, then the element $a[4][5]$ can be denoted by:
(a) $*(a + 4) + 5$ (b) $*a[4] + 5$
(c) $*(*(a + 4) + 5)$ (d) $a[4] + 5$.
- (iv) What happens when the following code is executed?
void main ()
{
 float a =10, b = 20, *j;
 void *k;
 j = &b;

- (viii) enum colors {BLACK, BLUE, GREEN}
main()
{
printf("%d..%d..%d", BLACK,BLUE,GREEN);
return(1);
}
(a) BLACK..BLUE..GREEN (b) 1..2..3
(c) 0..1..2 (d) Compilation Error.
- (ix) What will be the output of the following program?
void main()
{
char str1[] = "abcd";
char str2[] = "abcd";
if(str1==str2)
printf("Equal");
else
printf("Unequal");
}
(a) Equal (b) Unequal
(c) Error (d) None of these.
- (x) Which of the following is the correct usage of conditional operators used in C?
(a) a>b ? c=30 : c=40; (b) a>b ? c=30;
(c) z = a>b ? a>c? a:c:b>c? b:c; (d) return (a>b)?(a:b);

Group - B

2. (a) Show the memory content of $(17.625)_{10}$, using IEEE 754 floating point (32 bits) representation.
(b) Justify, why the range of signed short integer (2 bytes) is -32768 to +32767.
(c) Distinguish between compiler and interpreter.
(d) The n -th term of the Fibonacci series is defined as,
$$F_n = F_{n-1} + F_{n-2}; F_0 = 0, F_1 = 1.$$

Draw a flowchart to display F_n , the n -th term of the series.
$$3 + 3 + 3 + 3 = 12$$
3. (a) What are auto, extern and static variables? Explain their uses with suitable example.

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3. (a) What are auto, extern and static variables? Explain their uses with suitable example.

- (b) What is the utility of break statement in loop? Give an example. How is break statement different from an exit() statement?
- (c) Explain with a suitable example, the difference between pre-increment and post-increment operators in C.

6 + 4 + 2 = 12

Group - C

4. (a) What is a function? Can a function return multiple values to the caller using return reserved word? Briefly describe function declaration and definition.
- (b) Write a C program that takes x and n as inputs, and then find the value of the following series up to n terms for a given x :
 $x/2 - x^2/2 + x^3/3 - x^4/4 + x^5/5 - \dots$

(1 + 2 + 2) + 7 = 12

5. (a) Explain the use of break and continue statement in loops with example.
- (b) Write a program to take number of rows to be printed as input and display the following output. If number of rows to be printed is 4 then the output will be
- ```
*
**


```

- (c) Write a C program using recursion to reverse an integer number NUM and check whether it is PALINDROME or NOT.

**2 + 4 + 6 = 12**

**Group - D**

6. (a) Explain the meaning of the following declarations:  
float \*p [10];  
float \*p ();
- (b) What do you mean by pointer arithmetic? Explain with an example.
- (c) Write a program to display the frequency of characters in a given string.

**3 + 3 + 6 = 12**

- (b) What is the utility of break statement in loop? Give an example. How is break statement different from an exit() statement?
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**6 + 4 + 2 = 12**

**Group - C**

4. (a) What is a function? Can a function return multiple values to the caller using return reserved word? Briefly describe function declaration and definition.
- (b) Write a C program that takes  $x$  and  $n$  as inputs, and then find the value of the following series up to  $n$  terms for a given  $x$ :  
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**(1 + 2 + 2) + 7 = 12**

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*
**
***
****
```

- (c) Write a C program using recursion to reverse an integer number NUM and check whether it is PALINDROME or NOT.

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3 + 3 + 6 = 12