

**B.E. INSTRUMENTATION AND ELECTRONICS ENGINEERING
EXAMINATION**

1ST YEAR 2ND SEMESTER – 2019 (old)

NUMERICAL METHODS & COMPUTER PROG.

Time: Three Hours

Full Marks: 100

Answer Question No. 1 and any FOUR Questions from the rest

1. a) Write the output of the following program snippets and *justify* them in brief (Any Five):

<p><u>i)</u> <pre>int main() { unsigned int i=10; while(i-- >= 0) printf("%u ",i); return 0; }</pre> </p>	<p><u>ii)</u> <pre>int main() { int a[10]; printf("%d",*a+1-*a+3); return 0; }</pre> </p>
<p><u>iii)</u> <pre>#define prdf(a,b) a*b int main() { int c=3,d=4; printf("%d",prdf(c+2,d-1)); return 0; }</pre> </p>	<p><u>iv)</u> <pre>#include <stdio.h> void main() { int a[5] = { 5, 1, 15, 20, 25 }; int i, j, m; i = ++a[1]; j = a[1]++; m = a[i++]; printf("%d, %d, %d", i, j, m); }</pre> </p>
<p><u>v)</u> <pre>void main() { int m, i = 0, j = 1, k = 2; m = i++ j++ k++; printf("%d %d %d %d", m, i, j, k); }</pre> </p>	<p><u>vi)</u> <pre>void main() { char* p; printf("%d %d",sizeof(*p),sizeof(p)); }</pre> </p>

5×3 = 15

b) Write whether the following statements are TRUE or FALSE.

- i) Cache memory is faster than RAM.
- ii) calloc function requires two parameters.
- iii) do-while is an entry control.
- iv) int x5, x_y, A_x_2; is a valid statement.
- v) "FILE" is the name of a system-defined structure in C.

5×1 = 5

2. a) Write a program in C to check whether a number is palindrome or not.
b) Write a program in C to compare two strings without using <string.h>. Check for unequal strings.

8+12 = 20

3. a) Write a program in C to display the following pattern.

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

- b) Distinguish between *call-by-value* and *call-by-reference* function calling mechanisms.

10+10 = 20

4. a) Using bisection, find the largest root of $f(x) = x^2 - 3$ and start with the interval [1,2] and $e=0.01$.
b) Discuss absolute error and relative error in numerical analysis.

14+6 = 20

5. a) Using *Secant* method, find the roots of equation $x^3 = 20$ for three iterations. (Given, $x_0 = 4, x_1 = 5.5$)
b) Briefly discuss the *Newton Raphson* method.

12+8=20

6. Write short notes on the following.

- a) Basic computer architecture.
b) Pointer in C.
c) Structure and Union in C.
d) C operators.

5+5+5+5 = 20