Reg. No:

X/D/TZ

Final Assessment Test – April 2026

VIT Vellore Institute of Technology

Course: BECE320E - Embedded C Programming

Class NBR(s): 0844 / 0846 / 0848 / 0850

Slot: B1

Time: Three Hours

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

COs	CO Statements
CO1	Apply the C programming language for various data types and decision making applications.
CO2	Apply the knowledge of derived data types, pointers, and functions in C to write a program.
CO3	Describe the architecture of 8051 microcontroller for programming & interfacing applications.
CO4	Write the embedded C code to 8051 for programming I/O ports, timers, serial communication, interrupt and interfacing external peripherals.
CO5	Develop microcontroller based applications.

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Analyse the following Code and write the output of the same. CO1 BL3

a)
```
#include <stdio.h>
void main() {
 int *a , **b;
 char *c;
 printf("%d\n %d\n  %d", sizeof(a), sizeof(b),     sizeof(c)); }
```

b)
```
 # include <stdio.h>
 int main( ) {
 static int catch = 5 ;
 printf ( "Mango is left = %d\n", catch-- ) ;
 if ( catch != 0 )
  main( ) ;
 return 0 ;
 }
```

c)
```
#include <stdio.h>
int main() {
  int a = -1, b = 4, c = 1, d;
  d = ++a && ++b || ++c;
  printf("%d, %d, %d, %d \n", a, b, c, d);
  return 0;
}
```

d)

```
#include <stdio.h>
int main( )
{
char s1[7] = "1234", *p;
p = s1 + 2;
*p = '0' ;
printf ("%s", s1);
}
```

2. Identify and correct the errors in the following C programs. Rewrite the programs after making the necessary corrections without changing given logic. CO1 BL3 [5]

a)

```
//The following program displays the Fibonacci series.
#include <stdio.h>
void printFib(int n); {
        if (n > 1) {
                printf("Invalid Number of terms\n");
                return; }

        int prev1 = 1;
        int prev2 = 2;
        for (int i = 1; i <= n; i++) {
        if (i < 2) {
                int num = prev1 + prev2;
                prev2 = prev1;
                prev1 = num;
                printf("%d ", num); }
        if (i != 1) {
                printf("%d ", prev2); }
        if (i != 2) {
                printf("%d ", prev1) }
        }
}
int main() {
        int n = 9;
        printFib(n)
        return 0; }
```

b)

// The following program reverses a given number eg. if 501 is the input 105 will be printed. [5]

```
#include <stdio.h>
int main() {
  int num, rev, rem;
  printf( 'Enter a number: ');
  scanf("%d", num);

  while (num != 1)
    rem = num % 10;
    rev = rev * 10 + rem
    num = num / 10;

  printf("Reversed number = %d\n", rev)
  return 0;
```

3. a) Write a C program for Simple Calculator using switch case. [5] CO2 BL3
   b) Write a C program to determine if the user given number is even or odd using if and else statement. [5]

4. Write a C program to find the longest and smallest word in a string. CO2 BL3

5. a) Write a program in C to swap two numbers input by the user using a function call by reference. Display the result before swapping and after swapping. [5] CO2 BL3
   b) Write a C program to check if a given number is a palindrome using function. [5]

6. a) Write down the steps and equivalent embedded C statements to set the baud rate of an 8051 microcontroller. [5] CO3 BL3
   b) Draw the format of the SCON register and explain the use of each flag in it. [5]

7. a) A door sensor is connected to the P1.2 pin, and a buzzer is connected to P1.7. Write an 8051 C program to monitor the door sensor, and when it opens, sound the buzzer. The buzzer should be activated by sending a square wave of few hundred Hz. [5] CO4 BL
   b) Write a 8051 C program to convert ASCII digits of '4' and '7' to packed BCD and display them on P1. [5]

8.(a) Write a 8051 C program to transmit the message "VIT UNIVERSITY" serially at the baud rate of 19200 and if any data received serially should be forwarded to P1 without using interrupt. CO4 BL3

OR

8.(b) Assume a SWITCH (SW) is connected at P1.2 of an 8051 microcontroller. If SW is HIGH, send the message "SWITCH IS IN HIGH STATE" serially at the baud rate of 57600. Else, send the message "SWITHC IS IN LOW STATE" serially at the baud rate of 28800. CO4 BL3

9.(a) Write a C program using interrupts to do the following: CO4 BL3

(i) Receive data serially and send it to P0

(ii) Read port P1, transmit data serially at the baud rate of 9600, and give a copy to P2

(iii) Make timer 0 generate a square wave of 7 kHz frequency on P3.7. Assume that XTAL = 11.0592 MHz.

OR

9.(b) Write an 8051 C program to perform the following tasks simultaneously. CO4 BL3

(i) Transfer data from P1.1 to P1.5

(ii) Send the serially received data to P0 at the baud rate of 4800.

(iii) Increment the data at P2 whenever an edge triggering on External interrupt 1.

Assume XTAL =11.0592 MHz.

10. Design an application to interface Common Anode 7-segment LED with 8051 Microcontroller. Also, write an embedded C program to display the hexadecimal digits from 0 to F on it. CO5 BL3

⇔⇔⇔ X/D/TZ⇔⇔⇔