BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSC **SEMESTER : Ist**
BRANCH: QEDS **SESSION : MO/2022**

SUBJECT: ED109 INTRODUCTION TO PROGRAMMING AND DATA STRUCTURE

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO
Q.1(a)	The content of PC in the basic computer is 3AF (all numbers are in hexadecimal). The content of AC is 7EC3. The content of memory at address 3AF is 932E. The content of memory at address 32E is 09AC. The content of memory at address 9AC is 8B9F. i. What is the instruction that will be fetched and executed next? ii. Show the binary operation that will be performed in the AC when the instruction is executed. iii. Give the contents of registers PC, AR, DR, AC, and IR in hexadecimal and the values of E, I, and the sequence counter SC in binary at the end of the instruction cycle.	[5]	CO1
Q.1(b)	Describe the expanded structure of IAS computer.	[5]	CO1
Q.2(a)	Interpret the meaning of the control string in each of the following scanf functions. i. `scanf("%12ld %5hd %15lf %15le", &a, &b, &c, &d);` ii. `scanf("%10lx %6ho %5hu %14lu", &a, &b, &c, &d);` iii. `scanf("%12D %hd %15f %15e", &a, &b, &c, &d);` iv. `scanf("%8d %*d %12lf %12lf", &a, &b, &c, &d);`	[5]	CO2
Q.2(b)	Describe the difference between ROM, PROM, EPROM, EEPROM and Flash Memory.	[5]	CO2
Q.3(a)	Describe the output that will be generated of the following C program.	[5]	CO3
Q.3(b)	Define Abstract Data Types. Write short notes on operations possible on Queues along with their pseudo codes.	[5]	CO3
Q.4(a)	When passing an argument to a function, what is the difference between passing by value and passing by reference? To what types of arguments does each apply?	[5]	CO4

```
#include <stdio.h>
main()
{
int i = 0, x = 0;
while (i < 20)
{
if (i % 5 == 0)
{
x += i;
printf("%d ", x);
}
++i;
}
printf("\nx = %d", x);
}
```

Q.4(b) Consider the following algorithm: [5] CO4

```
algorithm fun1 (x)
1 if (x < 5)
1 return (3 * x)
2 else
1 return (2 * fun1 (x - 5) + 7)
3 end if
end fun1
```

What would be returned if fun1 is called as

i. fun1 (4)?
ii. fun1 (10)?
iii. fun1 (12)?

Q.5(a) Using manual transformation, write the following infix expressions in their postfix and prefix forms: [5] CO5

i. (A + B) * C – D * F + C
ii. (A – 2 * (B + C) – D * E) * F

Q.5(b) An array contains the elements shown below. [5] CO5

21 7 84 19 22 78 6 30

Apply the merge sort schematically to sort this array.

:::::21/03/2023 M:::::