

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

CLASS: IMSc.
BRANCH: QEDS

SEMESTER: 1st
SESSION : MO/2024

SUBJECT: ED24109 INTRODUCTION TO PROGRAMING & DATA STRUCTURE

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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|--|-----|-----|---------|
| Q.1(a) On the IAS computer, describe the process that the CPU must undertake to read a value from memory and to write a value to memory in terms of what is put into the MAR, MBR, address bus, data bus, and control bus. | [2] | CO1 | BL
1 |
| Q.1(b) On the IAS computer, what would the machine code instruction look like to load the contents of memory address 2 to the accumulator? | [1] | CO1 | 2 |
| Q.1(c) Evaluate the trips to memory, does the CPU need to make to complete the instruction in 1(b) during the instruction cycle? | [2] | CO1 | 2 |
| | | | |
| Q.2(a) Describe the steps to add the contents of the memory word at address 940 to the contents of the memory word at address 941 and store the result in the latter location. It's specified that Value of IR is 1940, PC is 300, M [301] =5941, M [940] =0003, M [941] =0002. The initial value of AC=0. | [3] | CO1 | 3 |
| Q.2(b) Perform the indicated base conversions: | [2] | CO1 | 2 |
| (i) 54 ₈ to base 5 | | | |
| (ii) 312 ₄ to base 7 | | | |
| (iii) 520 ₆ to base 7 | | | |
| (iv) 12212 ₃ to base 9 | | | |
| | | | |
| Q.3(a) Convert the following decimal numbers to their binary equivalents: | [2] | CO2 | 2 |
| (i) 34.75 | | | |
| (ii) 25.25 | | | |
| (iii) 27.1875 | | | |
| Q.3(b) What would be the output of each of the following code segments? | [3] | CO2 | 2 |
| (i) count = 5;
while (count -- > 0)
printf(count); | | | |
| (ii) count = 5;
while (-- count > 0)
printf(count); | | | |
| (iii) count = 5;
do printf(count);
while (count > 0); | | | |
| (iv) for (m = 10; m > 7, m -=2)
printf(m); | | | |

- Q.4(a) Write a program to print a two-dimensional Square Root Table as shown below, to provide the square root of any number from 0 to 9.9. For example, the value x will give the square root of 3.2 and y the square root of 3.9. [2] CO2

Square Root Table

Number	0.0	0.1	0.2	0.9
0.0					
1.0					
2.0					
3.0			x		y
9.0					

- Q.4(b) Find errors, if any, in the following program: [3] CO2

```

/* A simple program
int main( )
{
    /* Does nothing */
}

#include <math.h>
main { }
(
    FLOAT X;
    X = 2.5;
    Y = exp(x);
    Print(x,y);
)

#include (stdio.h)
void main(void)
{
    print("Hello C");
}

```

[1]

[1]

- Q.5(a) Which of the following header lines are invalid? Why? [2] CO2 3

```

float average (float x, float y, float z);
double power (double a, int n - 1)
int product (int m, 10)
double minimum (double x; double y; )

```

- Q.5(b) Given the radius of a circle, write a program to compute and display its area. Use a symbolic constant to define the Π value and assume a suitable value for radius. [3] CO2 2