ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION   SUMMER SEMESTER, 2022-2023
DURATION: 1 HOUR 30 MINUTES   FULL MARKS: 75

CSE 4281: Computer Programming

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer all 3 (three) questions. Figures in the right margin indicate full marks of questions with
corresponding COs and POs in parentheses.

1. a) What is the difference between an analog and a digital computer? Would it be accurate to   7
    suggest that first-generation computers were analog? Justify your answer.   (CO1)
       (PO1)

   b) Do CPU registers perform any processing? What is the primary role of registers? Mention   10
    the purposes served by the following registers: (CO1)
       (PO1)
      i. Instruction Register (IR)
      ii. Program Counter (PC)
      iii. Memory Buffer Register (MBR)
      iv. Data Register (DR)

   c) Discuss the entire instruction cycle of a CPU to execute the ADD instruction.   8
       (CO1)
       (PO1)

2. a) Describe the memory hierarchy of computers with appropriate visualization, according to   7
    the factor of access time. Is there any relationship between access time and cost in the mem-   (CO1)
    ory hierarchy?   (PO1)

   b) How is the Unicode different from the other Binary coding schemes? Perform binary addi-   8
    tion of the following numbers: (CO1)
       (PO1)
    $$(-9) = (-23)$$

   c) Write some of the key characteristics of a good program. Draw the flowchart to find the sum   10
    of all even numbers till 100.   (CO2)
       (PO1)

3. a) Describe the working methodology of a magnetic disk. What is the latency time (in seconds)   12
    of a magnetic disk with an 8 millisecond access time, a 3 millisecond seek time, and a 2   (CO1)
    millisecond data transfer rate?   (PO1)

   b) Discuss the typical sizes and tasks of different types of cache memories. Why are they so   7
    small in size?   (CO1)
       (PO1)

   c) Is it necessary for organizations such as banks or businesses to purchase supercomputers to   6
    handle the workload? How would you ensure that the centralized database is accessible in   (CO1)
    this scenario? Justify your response.   (PO1)