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

MID SEMESTER EXAMINATION
 DURATION: 1 HOUR 30 MINUTES

WINTER SEMESTER, 2022-2023
 FULL MARKS: 75

CSE 4361: Computer Science and Technology I

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 whereas corresponding CO and PO are written within parentheses.

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|----|--|-------------------------|
| 1. | <p>a) Perform the following conversions:</p> <p>i. $(10101100100100)_2 = (?)_{16}$</p> <p>ii. $(251)_{10} = (?)_2$</p> <p>iii. $(DAB)_{16} = (?)_8$</p> <p>iv. $(10011011)_2 = (?)_{10}$</p> <p>v. $(11000011.111)_2 = (?)_{10}$</p> | 5 × 2
(CO1)
(PO1) |
| | <p>b) Perform the following operations:</p> <p>i. $(111100)_2 + (011011)_2$</p> <p>ii. $(111000)_2 - (011010)_2$</p> <p>iii. $(101101)_2 + (1101)_2$</p> | 3 × 2
(CO1)
(PO1) |
| | <p>c) Imagine you are the owner of an online business that sells a wide range of products. One of your key business strategies is to offer dynamic pricing for certain items to attract more customers on the dates of the year that, when concatenated, forms a prime number. To implement this strategy effectively, you need a tool that can help you identify prime numbers within a given range.</p> <p>Write a program to determine all prime numbers within the specified price range $[a...b]$ where a and b are input through keyboard and a must be smaller than b.</p> | 8
(CO2)
(PO1) |
| 2. | <p>a) Define Microprocessor? List five (5) important registers of the CPU and state their purposes.</p> | 7
(CO1)
(PO1) |
| | <p>b) There are five processes P_1, P_2, P_3, P_4, P_5 having CPU time 7, 3, 2, 10 and 8. Show the CPU execution of these processes using three (3) CPU scheduling algorithms. Also, calculate the waiting time for each process.</p> | 10
(CO1)
(PO1) |
| | <p>c) "XYZ" organization needs a temperature monitoring system that can read the temperature data for each day of a month and then report the month's average temperature as well as its hottest and coolest days.</p> <p>Write a program satisfying the mentioned requirements for the temperature monitoring system.</p> | 8
(CO2)
(PO2) |
| 3. | <p>a) Explain the need of cache memory. With brief explanation, name the four steps involved in an instruction cycle.</p> | 10
(CO1)
(PO1) |
| | <p>b) i. Differentiate between RAM and ROM.
 ii. Why is it necessary to perform memory management? Describe the multiple partition allocation memory management scheme.</p> | 10
(CO1)
(PO1) |
| | <p>c) List the main functions of the Operating System? How does the Round Robin algorithm overcome the drawback of the First-Come, First-Serve and the Shortest Job First Algorithm?</p> | 6
(CO1)
(PO1) |