

CAT I

SLOT:C1+TC1

Programme Name & Branch: M.Tech (CSE)

Course Name & Code: MCSE503L Computer Architecture and Organisation

Class Number (s): VL2024250107313

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Exam Duration: 90 Min.

Maximum Marks: 50

Q.No.	Question	Max Marks
1.	<p>a). Based on Flynn's classification of computers, explain about any 2 architectures</p> <p>b) Write an assembly language program for the following statement and give the detailed flow of instruction and data as per the IAS architecture</p> $X = (A+B) * (C-D)$ <p>Assume any memory location for data and result</p>	10
2.	<p>a) The speed of multicore processors are faster compared to single core. Justify</p> <p>b) There are 2 programs running on 2 different computers with the following specifications. Computer A-Clock frequency 1 Mhz, 4 instructions with 2-Type A, 1-Type B and 1-Type C instructions. Computer B- Clock frequency 1.5 Mhz 2 instructions with Type B and Type C instructions.</p> <p>Type A=2 cycles Type B=3 cycles Type C=4 cycles. Calculate the CPU time of both and find out the CPI factor by which one computer is faster than the other</p>	10
3.	<p>a) Explain how threading helps in increasing the throughput and turnaround time</p> <p>b) A given serial task is split into four consecutive parts, whose percentages of execution time are $p_1 = 0.11$, $p_2 = 0.18$, $p_3 = 0.23$, and $p_4 = 0.48$ respectively. Assume that the 1st part is not sped up, while the 2nd part is sped up 5 times, the 3rd part is sped up 20 times, and the 4th part is sped up 1.6 times. Calculate the overall speedup using Amdahl's law</p>	10
4.	<p>a) Discuss how Instruction level parallelism is achieved in a 5 stage pipeline</p> <p>b) Identify the hazard that occurs due to the following code and suggest the means to overcome it. $R1 = R4 + R5$; $R2 = R1 + R3$</p>	10
5.	<p>a) Write an OpenMp code to find the thread id and print VIT if the id is 1, otherwise it should print VTOP</p> <p>b) Use work sharing construct and write an OpenMp code to find the time difference in both sequential and parallel execution for 4×1 matrix addition</p>	10