

		ITER, SIKSHA 'O' ANUSANDHAN (Deemed to be University)		Assignment																
Branch		Computer Science Engineering, Computer Science and Information Technology		Program																
Course Name		Computer Organization and Architecture		Semester																
Course Code		EET2211		Academic Year																
Assignment-1		Topic- Basic concepts and computer evolution, Performance issues		GP-1																
Learning Level (LL)		L1: Remembering		L3: Applying																
		L2: Understanding		L5: Evaluating																
		L4: Analysing		L6: Creating																
Q's	Questions			COs	LL															
1	List and briefly define the main structural components of a single processor computer.			CO1	L1															
2	Differentiate between i) microprocessor and microcontroller ii) computer organization and computer architecture iii) embedded system and deeply embedded system			CO1	L1															
3	List and explain the cloud computing services.			CO1	L1															
4	Briefly explain the different techniques used to increase the microprocessor speed.			CO1	L1															
5	Consider two different machines, with an instruction set of 100000instructions, both of which have a clock rate of 400MHz. The following measurements are recorded on the two machines running a given set of benchmark programs: Machine A:			CO2	L2															
	<table><tr><th>Instruction Type</th><th>Instruction mix (%)</th><th>Cycles per Instruction</th></tr><tr><td>Arithmetic and Logic</td><td>50</td><td>2</td></tr><tr><td>Data transfer</td><td>15</td><td>3</td></tr><tr><td>Control transfer</td><td>15</td><td>4</td></tr><tr><td>others</td><td>20</td><td>2</td></tr></table>					Instruction Type	Instruction mix (%)	Cycles per Instruction	Arithmetic and Logic	50	2	Data transfer	15	3	Control transfer	15	4	others	20	2
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	Arithmetic and Logic	50	2																	
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	others	20	2																	
	Machine B:																			
	<table><tr><th>Instruction Type</th><th>Instruction mix (%)</th><th>Cycles per Instruction</th></tr><tr><td>Arithmetic and Logic</td><td>65</td><td>1</td></tr><tr><td>Data transfer</td><td>15</td><td>4</td></tr><tr><td>Control transfer</td><td>10</td><td>3</td></tr><tr><td>others</td><td>10</td><td>2</td></tr></table>					Instruction Type	Instruction mix (%)	Cycles per Instruction	Arithmetic and Logic	65	1	Data transfer	15	4	Control transfer	10	3	others	10	2
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Determine the effective CPI, execution time, and MIPS rate for both machines.																				

6	A doctor in a hospital observes that on average 6 patients per hour arrive and there are typically 3 patients in the hospital. Determine the average range of time each patient spends in the hospital.	CO2	L2												
7	Determine the fraction of the execution time involves code that is parallel to achieve an overall speedup of 2.25. Assume 15 numbers of parallel processors.	CO2	L2												
8	<p>Two benchmark programs are executed on three computers with the following results:</p> <table border="1"> <thead> <tr> <th></th><th>Computer A</th><th>Computer B</th><th>Computer C</th></tr> </thead> <tbody> <tr> <td>Program 1</td><td>50</td><td>20</td><td>10</td></tr> <tr> <td>Program 2</td><td>100</td><td>200</td><td>40</td></tr> </tbody> </table> <p>The table shows the execution time in seconds, with 10,000,000 instructions executed in each of the two programs. Calculate the MIPS values for each computer for each program. Then calculate the arithmetic and harmonic means assuming equal weights for the two programs, and rank the computers based on arithmetic mean and harmonic mean.</p>		Computer A	Computer B	Computer C	Program 1	50	20	10	Program 2	100	200	40	CO2	L2
	Computer A	Computer B	Computer C												
Program 1	50	20	10												
Program 2	100	200	40												
9	Let a program has 40% of its code enhanced to run 2.3 times faster. Determine the overall speedup of the system.?	CO2	L2												
10	Explain the different addressing modes of 8086 microprocessor with suitable examples.	CO6	L2												
11	Explain the register organization of 8086 microprocessor with suitable examples.	CO6	L2												
12	<p>(a) Write an assembly language program to multiply 40H with 8H using logical instructions of 8086 microprocessor only.</p> <p>(b) Determine the output memory location (data location) and the content of that location for the following code</p> <pre> Mov ax, 23f0h Mov bx, ax Mov [bx],ax Mov cx, 503fh Mov ax,cx Sub ax, [bx] Inc bx Inc bx Mov [bx], ax hlt </pre>	CO6	L2												

Assignment 1	Topic: Basic concepts and computer evolution, Performance issues	Date of Assignment 1: 07.03.2024	Date of Submission: 14.03.2024
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Note:

1. Assignment carries a weightage of 20 **marks out of 100**
2. Course outcomes CO1, CO2 and CO6 were covered.

Course Outcomes	CO1	Able to explain the concepts that underline the modern computers' evolution, function, and organization.
	CO2	Able to identify the appropriate organization of a computer for achieving the best performance.
	CO3	Able to analyse and demonstrate the computer function and interconnection.
	CO4	Able to understand and analyse the computer memory system.
	CO5	Able to understand and analyse computer arithmetic via digital logic.
	CO6	Able to interpret low-level processor operations using a series of computer instructions.