

**Sub: CO**

**Time: 1½ Hrs.**

**Date: 06-11-2017**

**Max Marks: 30M**

**Question 1 is compulsory. Answer one from 2 or 3 and one from 4 or 5.**

S.no	Questions	Marks	Unit	CO	Cognitive Level
1.i)	Compare Hardwired Control unit with Microprogram Control Unit	2	3	C301.3	Analyze
1.ii)	Explain how overflow is detected in signed magnitude addition and 2's complement addition.	2	3	C301.4	Understand
1.iii)	Explain Memory hierarchy	2	4	C301.5	Understand
1.iv)	Draw the block diagram of UART.	2	4	C301.5	Apply
1.v)	A non pipeline system takes 50nsec to process a task, the same can be done by a 6- segment pipeline with a clock cycle of 10nsec. Determine max speedup that can be achieved?	2	5	C301.6	Apply
2.a)	Explain the operation of micro program sequencer with neat diagram	5	3	C301.3	Understand
2.b)	Write micro-routines to fetch an instruction from memory	5	3	C301.3	Remember
3.a)	Explain decimal arithmetic unit with the help of diagram	5	3	C301.4	Understand
3.b)	Explain the algorithm for BCD multiplication	5	4	C301.4	Understand
4.a)	Describe how direct memory access is used to transfer data from	5	4	C301.5	Understand
4.b)	What is a virtual memory? Explain its features	5	4	C301.5	Understand
5.a)	Draw a diagram showing the structure of a four dimensional hypercube network. List all the paths available from node 7 to node 9 that use the minimum number of intermediate nodes.	10	5	C301.6	Apply

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1.ii)	Write examples for the operations DSHR, DSHL	2	3	C301.4	Apply
1.iii)	If main memory access time= 500nsec and cache memory access time is 50nsec and hit ratio is 0.8 calculate average access time.	2	4	C301.5	Apply
1.iv)	Draw the block diagram of a general purpose I/O interface	2	4	C301.5	Remember
1.v)	Draw the pipeline configuration to carryout $(A_i+B_i)*(C_i+D_i)$	2	5	C301.6	Apply
2.a)	Explain the operation of micro program sequencer with neat diagram	5	3	C301.3	Remember
2.b)	Write micro-routines to fetch an instruction from memory	5	3	C301.3	Remember
3.a)	Explain the hardware implementation of unsigned binary multiplication.	5	3	C301.4	Understand
3.b)	Perform multiplication of unsigned numbers 1101 and 1011	5	3	C301.4	Apply
4.a)	Explain the operation of Daisy-Chain interrupt	5	4	C301.5	Understand
4.b)	Explain in brief the different modes of transfer	5	4	C301.5	Understand
5.a)	What is meant by Data Conflict problem in RISC pipeline. How it is eliminated.	5	5	C301.6	Apply
5.b)	Draw a space time diagram for a six-segment pipeline showing the time it takes to process eight tasks.	5	5	C301.6	Apply

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1.ii)	Draw the diagram of 2 X 2 array multiplier?	2	3	C301.4	Remember
1.iii)	Explain Write Through technique and write back technique?	2	4	C301.5	Understand
1.iv)	Explain asynchronous data transfer with handshaking signal?	2	4	C301.5	Understand
1.v)	Draw the pipeline configuration to carryout $(A_i * B_i) + (C_i * D_i)$	2	5	C301.6	Apply
2.a)	Explain the operation of micro program sequencer with neat diagram	5	3	C301.3	Understand
2.b)	Write micro-routines to fetch an instruction from memory	5	3	C301.3	Understand
3.a)	Multiply 101111 with 110110 using Booth's algorithm.	5	3	C301.4	Apply
3.b)	How multiplication can be implemented using Booth's algorithm. Draw flowchart	5	3	C301.4	Remember
4.	Explain in detail the different mapping procedures in the organization of cache memory with necessary diagram	10	4	C301.5	Understand
5.	How instruction pipeline and arithmetic pipeline will improve the speed of the CPU.	10	5	C301.6	Apply

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1.ii)	In a BCD adder when 0110 is added to the result?	2	3	C301.4	Remember
1.iii)	Explain what is address space and what is memory space?	2	4	C301.5	Understand
1.iv)	Justify the use of IOP?	2	4	C301.5	Apply
1.v)	Explain instruction format of a vector processor?	2	5	C301.6	Remember
2.a)	Explain the operation of micro program sequencer with neat diagram	5	3	C301.3	Understand
2.b)	Write micro-routines to fetch an instruction from memory	5	3	C301.3	Understand
3.a)	Divide (-12) by (4) when these numbers are represented in sign magnitude form	5	3	C301.4	Apply
3.b)	Derive an algorithm in flow chart form for the restoring method of fixed point binary division	5	3	C301.4	Remember
4.a)	What is cache memory? Explain its operation.	5	4	C301.5	Understand
4.b)	Brief out the hardware organization of associative memory	5	4	C301.5	Analyze
5.a)	What is meant by Data Conflict problem in RISC pipeline. How it is eliminated.	5	5	C301.6	Analyze
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