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Code No.: 6135 M

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. (CBCS : ECE) I-Semester Make up Examinations, March-2017

(Embedded Systems & VLSI Design)

Advanced Computer Organization

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. Show the hardware implementation of 2's complement multiplication algorithm.
2. A non pipeline system takes 50 ns to process a task. The same task can be processed in a six segment pipeline with a clock cycle of 10 ns. Determine the speedup ratio of the pipeline for 100 tasks. What is the maximum speedup can be achieved?
3. Draw the machine instruction format and micro instruction format of a basic computer. Comment on the formats.
4. Distinguish between hard wired control unit and micro programmed control unit.
5. How many 128×8 RAM chips are needed to provide a memory capacity of 2048 bytes?
6. Define hit ratio and give the expression to compute the hit ratio.
7. Draw the block diagram of I/O interface.
8. Why does DMA have priority over the CPU when both request a memory transfer?
9. What is Instruction level Parallelism?
10. Give the applications of super computers.

Part-B (5 × 10 = 50 Marks)

(All bits carry equal marks)

11. a) Draw the flow chart for the non-restoring method of fixed point binary division.
b) Discuss the various hazards that might arrive in pipeline. What are the remedies commonly adapted to overcome/minimize the hazards.
12. a) "Hardware control is advantages over microprogrammed controlled unit". Justify your answer with valid reason.
b) Briefly explain Hardware control unit design methods.
13. a) Describe the principle of operation of associative cache memory with an example.
b) Illustrate LRU page replacement policy with an example.
14. a) Explain why is priority handling desired in interrupt controller? How does the priority scheme work?
b) What is the difference between isolated I/O and memory mapped I/O? What are the advantages and disadvantages of each?
15. a) Describe multi-processor system characteristics.
b) What is the shared memory organization? Give its advantages and disadvantages.

- 16. a) Design an array multiplier that multiplies two 2-bit numbers. Show the hardware using AND gates and binary adders.
- b) Describe the organization of SIMD array processor with the help of a neat schematic and explain its working principle.

- 17. Answer any *two* of the following:
 - a) Explain the need for memory hierarchy in computer systems.
 - b) Describe the key features of USB bus protocol
 - c) Unrolling a loop often improve the performance of instruction level parallel processor. Justify the statement with an example.

