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Question Paper Code : X 20424

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Seventh Semester
Electronics and Communication Engineering
EC 6009 – ADVANCED COMPUTER ARCHITECTURE
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define Response time and Throughput.
2. How addressing modes affect the instruction pipelining ?
3. Define super block.
4. Write down the possibilities of imprecise exception.
5. Mention the uses of having a bit vector.
6. Consider a non pipelined machine with 6 execution stages of lengths 50 ns, 50 ns, 60 ns, 60 ns, 50 ns and 50 ns. Find the instruction latency on this machine. How much time does it take to execute 100 instructions ?
7. List out the advantages of heterogeneous multi core processors.
8. Define coarse grained multithreading.
9. Define disk mirroring and write the drawbacks of disk mirroring.
10. Mention the factors that measure I/O performance.

PART – B **(5×13=65 Marks)**

11. a) i) List the different categories of computers and explain.
    ii) Mention five implementation technologies, which are critical to modern implementations and explain. **(6+7)**

(OR)

b) i) Describe the techniques to improve the energy efficiency of modern microprocessor.

ii) Some microprocessors today are designed to have adjustable voltage, so a 15% reduction in voltage may result in a 15% reduction in frequency. What would be the impact on dynamic energy and on dynamic power ? **(6+7)**

12. a) Describe how hardware based speculation overcomes the control dependencies.

(OR)

b) i) Show how the following loop would look on MIPS, both scheduled and unscheduled including any stalls. **(8)**

```
for(i = 1000; i > 0; i = i – 1)
x[i] = x[i] + s;
```

ii) List the limitations of ILP and Discuss in detail. **(5)**

13. a) i) Draw the basic structure of vector architecture and explain about its primary components.

ii) Describe how a vector processor works. **(5+8)**

(OR)

b) State the omissions and weakness of SIMD instruction set extension for multimedia. Give these weaknesses, why are Multimedia SIMD Extensions so popular ?

14. a) Discuss the performance of the symmetric shared memory with necessary graphs.

(OR)

b) Describe in detail about Directory-Based Cache Coherence Protocols.

15. a) i) Discuss how response time and throughput trade off against each other.

ii) Explain the segmented virtual memory protections with suitable example. Compare it with paged virtual memory. **(5+8)**

(OR)

b) Describe in detail about Redundant Array of Inexpensive Disks (RAID) with its advantages and disadvantages.

PART – C **(1×15=15 Marks)**

16. a) Explain the support of ILP to exploit thread level parallelism with an illustration.

(OR)

b) Explain performance issues in distributed shared memory.

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