



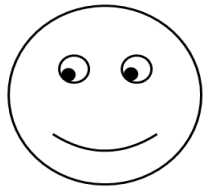
This quiz is for marks!

PLEASE ANSWER ON A SEPARATE PAGE

MAKE SURE YOUR STUDENT NUMBER IS ON YOUR ANSWER PAGE(s)

TOTAL NUMBER OF QUESTIONS : FIVE

time(min):

#	Question	Marks
Q1	<p>Briefly answer the following questions:</p> <p>(a) Present a counter argument to the premise: "wall clock time should be measured very accurately, +/- 1us if not better". [2 marks]</p> <p>(b) Briefly explain why a correlation of results from different implementations can be an important step in developing a digital system [2 marks]. Explain the correlation coefficient. (There is no need to show the correlation formula.) [2 marks]</p> <p>(c) Briefly describe a recommended practice for timing programs to establish reliable time results (mention at least three methods; 1 mark for quality of answer). [4 marks]</p>	10
Q2	<p>Please refer to the code snippet shown in Appendix A</p> <p>(a) Briefly explain what the ImageManip program shown in Appendix A does. (you don't need to explain the steps but more the overall operation done). [2 marks]</p> <p>(b) If the happy.jpg file (shown on right) was processed by the program, give an illustration in your answersheet of the resultant image that would be shown by the showimage command. [4 marks]</p> <p>(c) Which of the following memory partitioning models are used in the program? (just provide one of the letters corresponding to your choice) [2 marks] A. Contiguous B. Partitioned C. Interleaved D. Interlaced E. Haphazard</p> <p>(d) Explain your choice for (c) above. [3 marks]</p> 	11
Q3	<p>These question relates to CH1 of the textbook.</p> <p>(a) Which one of the following companies/institutes developed the TX-0 early computer system? (choose one option below) [2 marks] A. Malcom systems B. Intel C. Whirlwind computing systems D. Lincoln Labs E. Business Machines Solutions</p> <p>(b) Considering the historical perspective of computing platforms discussed in the chapter, round about when did the IBM Blue Gene debut? (choose one option) [2 marks] A. 1990-1994 B. 1995-1999 C. 2000-2004 D. 2005-2010 E. after 2010</p> <p>(c) The DoD decided to invest heavily in the VSIPL around the time that DSP processors were still rather very recent technologies. Answer the following: c1. Explain why there was such interest in the early stages of DSP processor production; i.e. what exactly was better about a DSP than the more traditional (and generally lower cost) processors of that time? [2 marks]</p> <p>c2. Choose the option below that most accurately describes what the VSIPL was: A. A customizable interconnection substrate for transferring vector data. B. A first of it's kind computer platform that used DSP processors in its design. C. A code library of image and vector processing routines. D. A benchmarking testbed for comparing speed performance of DSP processors. E. It was the first commercially available DSP processor. [2 marks]</p> <p>(d) Briefly explain what the bazar unit GOPS/liter which is used as a means to compare designs. Is this something that relates only to chip designs? (Ensure your explanation explains the term GOPS and clarify whether this relates to mcirochips, power conslumption, or to computer platforms). [3 marks]</p>	11

Q4	(a) Discuss the difference between the temporal and spatial paradigms of developing programs. Elaborate on benefits and drawbacks of these approaches. [4 marks] (b) SMP processors have become rather common nowadays. What does SMP stand for? [2 marks] (c) When developing software for a parallel system, much of the code ends up being sequential code that isn't actually executed in parallel. Elaborate (giving at least two reasons) on why this is often the case. [4 marks]	10
Q5	For each question below, select either option A or option B. Each question worth 2 marks. (a) Automatic parallelism refers to: A. Converting sequential code into parallel code B. Generating parallel code from a parallel language such as Simulink (b) The old conventional wisdom that uniprocessor speed doubles every 18 months is replaced by... A. It is unchanged. B. Brick wall - looks like a long wait for a means to continue this progression. (c) In consideration of the Berkeley paper, a "dwarf" is: A. It refers to a means to categorize the speed of an operation. (e.g. "Mr. Sulu, we've reached Dwarf factor two with our blur filter module.") B. An abstractly described process that is performed by a worker module to assist in completing a higher-level operation. (d) The Berkeley paper A. Confirms benefit of reconfigurable hardware approach; B. Argues against a reconfigurable hardware approach.	8
Q6	** BONUS MARK QUESTION: ** The RAPTOR, KASSPER and SP2 were all HPEC systems. List these in order (from left to right) of slowest to fastest (i.e. from lowest MOPS to highest MOPS).	[2]
TOTAL :		50

APPENDIX A : ImageManip program

This code snippet relates to Q2

```

global JPEG image; // an image of image.sizeX by image.sizeY pixels
global nth;
function threadfn ( int arg ) {
    int y = arg;
    while (y<image.sizeY) {
        for int x=0 to image.sizeX-1 {
            Pixel t = image.pixel[x,y];
            image.pixel[x,y] = image.pixel[image.sizeX-x-1,y];
            image.pixel[image.sizeX-x-1,y] = t;
        }
        y = y + nth;
    }
} // end function

function main () {
    image.load("happy.jpg");
    thread0 = create_thread(threadfn,0);
    thread1 = create_thread(threadfn,1);
    thread2 = create_thread(threadfn,2);
    thread3 = create_thread(threadfn,3);
    nth=4;
    wait(thread0);wait(thread1);
    wait(thread2);wait(thread3);
    showimage(image);
    wait_for_keypress();
}

```