

**NOTE: It is my policy to give a failing grade in the course to any student who either gives or receives aid on any exam or quiz.**

**INSTRUCTIONS: Answer all questions in your examination booklet, in sequence, please.**

1. Describe the procedure for setting up a project for both simulation and for downloading to an RC200E in as much detail as you can. Tell how to set up the workspace and what settings to make for each build configuration.
2. A student's program fails to compile with the message, "framebuffer.hcc Ln 57, Col 15-16: (E0035) Type 'unsigned int 10' does not match type 'unsigned int 12'."  
Line 57 of the program is:  

```
for( x = 0; x <visible_x; x++ ) {"
```

  
The following two declarations appear in the program:  

```
static unsigned 10 x;  
static macro expr visible_y =PalVideoOutGetVisibleY(PalVideoOutCT(0));
```

  
What does the error message mean, where do the numbers 10 and 12 come from in the error message, and how would you go about fixing the problem?
3. What is *PalVideoOutCT(0)*? What does "CT" stand for in its name?
4. What does *PalVideoOutGetVisibleY(...)* do?
5. Explain the difference between drawing an image on the RC200E touchscreen using *PalVideoOutGetX()/PalVideoOutGetY()* compared to *PalVideoOutGetHBlank()/PalVideoOutGetVBlank()*.
6. Write a complete Handel-C program that uses two threads to make a LED blink at a 5 Hz rate. One thread is to use a channel to tell the other thread when to change the state of the LED. The other thread is to change the state of the LED every time it receives a message from the channel. Include all code necessary including the code that the first thread uses to do the timing.
7. How many nanoseconds are there in 1.5 microseconds?
8. What is the essential difference between a Handel-C array and a *ram*?
9. Explain the differences among preprocessor macros, macro expressions, macro procs and functions. Give examples (descriptions, not code) of when each would (or would not) be most appropriate to use in a project.