Dr. Vivek Sehgal.

Roll No:..............

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 – December 2017

B.Tech (CSE & IT) 7th Semester

COURSE CODE: 13B1WCI731   MAX. MARKS: 35

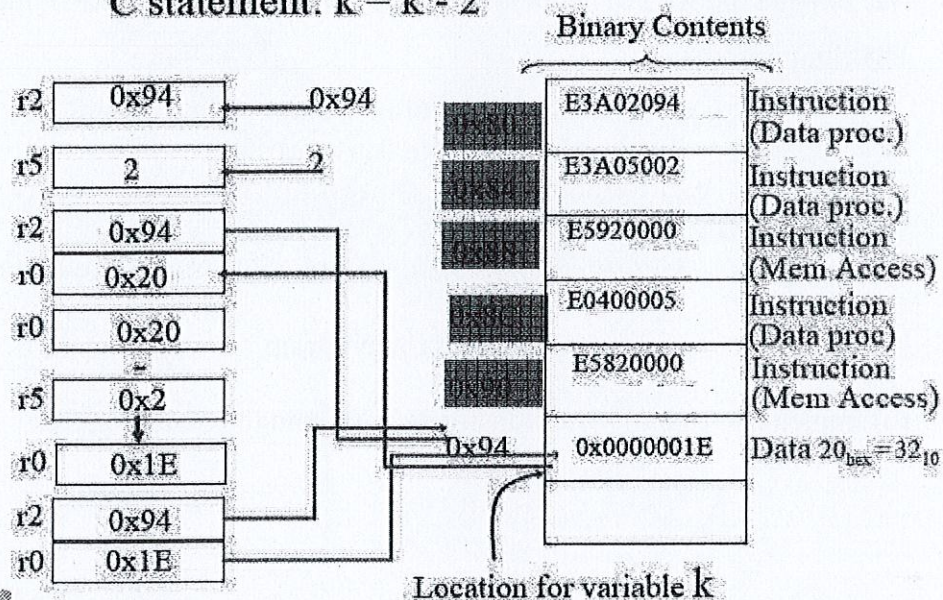COURSE NAME: Arm Based Embedded System Design

COURSE CREDITS: 03   MAX. TIME: 2 Hrs

Note: All questions are compulsory. The carrying of mobile phone during examinations will be treated as a case of unfair means.

1. (a) Write the instructions for binary contents of memory executing following C statement:

C statement: k = k - 2

(b) Explain Fetch Decode Execute Cycle for assembly code   [4+3]

2. (a) Explain the following Data Processing Instructions.
    i. Arithmetic Operations
    ii. Logical Operations. What is the value of r0 using BIC r0,r1,r2
        r1:   0101 0011 1010 1111 1101 1010 0110 1011
        r2:   1111 1111 1111 1111 0000 0000 0000 0000
        r0:
    iii. Register Moves
    iv. Comparison Operations
    (b) Explain the following Data Transfer Instructions with Example
    i. single register load/store instructions
    ii. Set up the address pointer

iii.   Base plus offset Addressing   [3.5+3.5]

3.   (a) Translate the following program in ARM assembly.

If ((a==b)&&(c==d))

++e;

(b) List all the conditional Instructions in a table with CPU condition flags.

(c) Write the expressions for following instructions   [2+3+2]
   i.   ADD r3,r2,r1,LSL#3
   ii.   ADD r5,r5,r3,LSLr2

4.   (a) WAP to print - Hello world!

(b) WAP to implement *for loop* in ARM assembly.

(c) WAP to block copy from one address (TABLE1) to another (TABLE2), then write it

out   [2+2+3]

5.   (a) Explain the ARM/Thumb interworking using ASM. Implement the following

algorithm in assembly.

   1.   Main: Generate branch address, and set bit0=1 to arrive at target in
        Thumb mode. Initial in ARM state
   2.   ThumbProg: Set values for r2, r3. Sum r2,r3 to r2. Executed in
        Thumb state.
   3.   ArmProg: Set values for r4, r5. Sum r4, r5 to r4. Executed in ARM
        state.
   4.   Stop: Terminate the program.

(b) Implement Thumb - ARM Instruction Mapping in 32 bit register   [4+3]