Vivek Sehgel Roll No:................

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- October 2019

B.Tech CSE/IT/ECE VII Semester

COURSE CODE: 13B1WCI731   MAX. MARKS: 25

COURSE NAME: ARM BASED EMBEDDED SYSTEM DESIGN
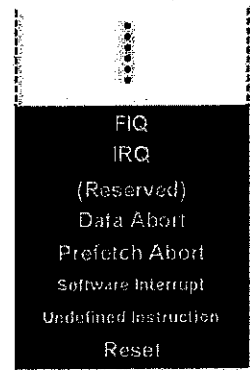
COURSE CREDITS: 03   MAX. TIME 1.5Hr

Note: All questions are compulsory. Each question carries equal marks. Carrying of mobile phone during examinations will be treated as case of unfair means.

1. (a) Draw and Explain the schematic of the ARM processor. What is the main difference between ARM and X86 architecture?
   (b) Write down the steps during Exception Handling and during the return of exception handler as shown in Fig.

0x1C	FIQ
0x18	IRQ
0x14	(Reserved)
0x10	Data Abort
0x0C	Prefetch Abort
0x08	Software Interrupt
0x04	Undefined Instruction
0x00	Reset

Vector Table
Vector table can be at 0xFFFF0000 on ARM720T and on ARM9/10 family devices
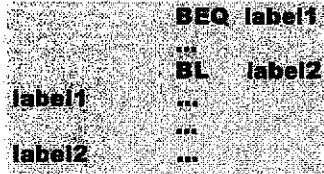
2. (a) Draw and explain The Format of simple Branch or Branch with Link instruction:
   - B{condition} <address>
   - BL{condition} <address>

   (b) Let's assume that label1 and label2 correspond to addresses 0x1B40 and 0x2B40, respectively. Further, assume that the address of the "BEQ" instruction is 0x0110 and of the "BL" instruction is 0x0130

   ```
        BEQ  label1
        ...
        BL   label2
   label1  ...
   label2  ...
   ```
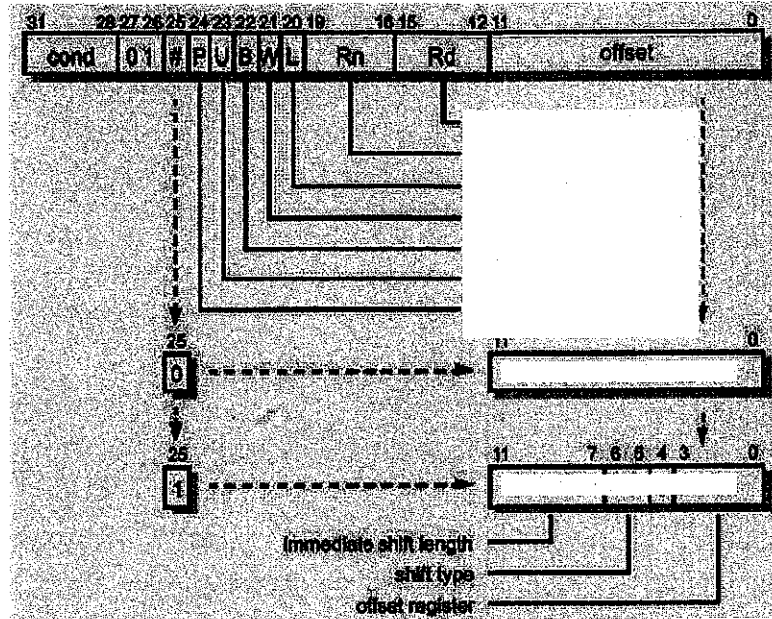
   What is the Byte offset for BEQ and BL? What is the Word offset for BEQ and BL? Write the machine code representation for BEQ label1 and BL label2

3. (a) Draw and Explain the format for Data Processing Instruction Binary Encoding
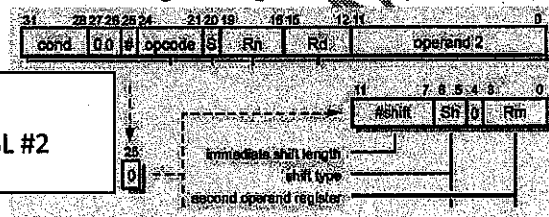   (b) Explain the following Data Processing Instructions with Opcode and Effect

SUB	Subtract
RSB	Reverse subtract
ADD	Add
ADC	Add with carry
SBC	Subtract with carry
RSC	Reverse subtract with carry
TST	Test
TEQ	Test equivalence
CMP	Compare

4. (a) Complete the following format for Data Transfer Instructions (LDR/STR)

(b) Write the Hex code of following Example of Data Processing Instructions

1. ADD r5, r1, r3
2. ADDNES r0, r0, r0 LSL #2

5. (a) What are Multiple Register Transfer Instructions? Explain with format and example.
   (b) WAP to:
      i.   Compare value of R7 with 1000
      ii. Add R2 to R3, store result in R4
   (c) Explain the following instructions: