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

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 – October 2017

B.Tech (CSE & IT) 7ᵗʰ Semester

COURSE CODE: 13B1WCI731   MAX. MARKS: 25
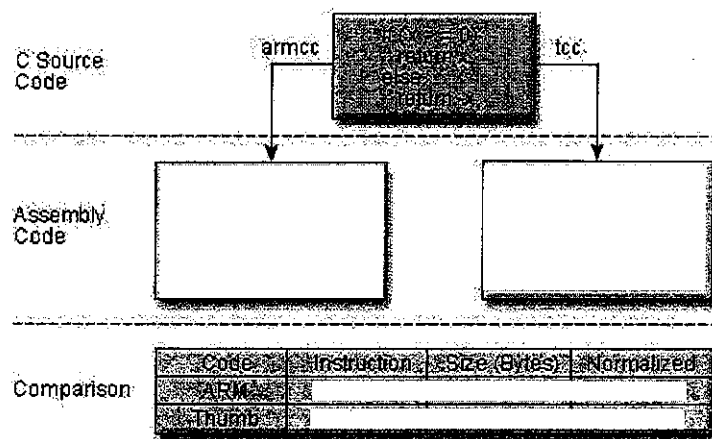
COURSE NAME: Arm Based Embedded System Design

COURSE CREDITS: 03   MAX. TIME: 1.5 Hrs

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

1. (a) Draw and explain the block diagram of ARM processor. What is the significance of barrel shifter?

    (b) Translate the following C code using *armcc* and *tcc* compilers and fill the comparison table.

2. (a) Explain the Branch and Branch with Link instructions. Write all the condition codes for top 4 bits [31:28] are used to specify the conditions under which the instruction is executed.

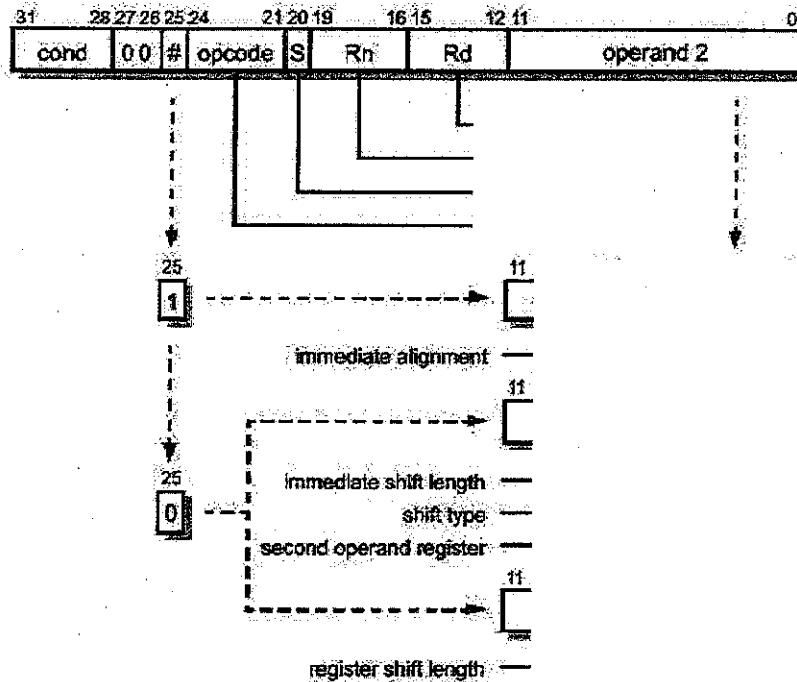| Opcode [31:28]	Mnemonic Extension	Interpretation	Status flag state for execution

    (b) Calculate the byte offset for BEQ and BL Instructions:
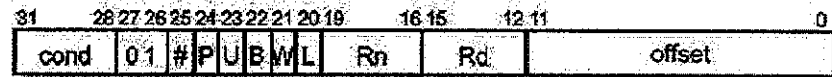
```
        BEQ  label1
        ...
        BL   label2
label1  ...
        ...
label2  ...
```

3. (a) List all the ARM data processing instructions.

(b) Encode and explain the data processing instruction.

4. (a) Explain the Data Transfer Instructions (LDR/STR) in following format:

(b) What are Multiple Register Transfer Instructions? Explain with format and example.

5. (a) List all the Multiply Instructions [23:21].

(b) WAP to calculates a scalar product of two vectors, 20 long.

- r8 and r9 points to the two vectors

- r11 is the loop counter

- r10 stores the result