

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-2 EXAMINATION – October 2018
B.Tech, VIIth Semester, ECE

Dr. Emjce Puthur

COURSE CODE: 18B1WEC735

MAX. MARKS: 25

COURSE NAME: EMBEDDED SYSTEM DESIGN

COURSE CREDITS: 3

MAX. TIME: 1.5 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Missing data, if any, can be appropriately assumed.

1. What are the different operating modes in which an ARM processor can operate? Explain the programmer's model of ARM processors with a suitable sketch. Describe the principal features of ARM architecture. (5)
2. What is conditional instruction set in ARM processors? How it is implemented in ARM instruction set? With suitable sketch, briefly explain how the instruction pipelining and the use of conditional instructions can result in improvement of execution speed. (5)
- 3(a) Find the value of the register r0 after executing each set of instructions. (2)
 - (i) MOV r1, #3
ADD r0, r1, r1, LSL#2
ORR r0, r0, #16
 - (ii) MOV r3, #5
SUBS r0, r3, r3
MLAEQ r0, r3, r3, r3
- (b) Write an assembly level program for ARM processor to display your name stored as a null terminated ASCII character array labeled MYNAME. Use ARM system calls to display character and end the program. (System call type 0 displays ASCII character stored in r0 at the standard output; system call type 11 end the program. (3)
4. Explain the mechanism of barrel shifter used in the ARM processor. What is the advantage using barrel shifter? Give examples of instructions that use barrel shifter. (5)
5. Show how the Harvard architecture is implemented in PIC microcontrollers. Describe the salient features of PIC microcontrollers that made them popular. (5)