

COLLEGE OF ENGINEERING, PUNE-5.

(An Autonomous Institute of Government of Maharashtra)

ENS SEMESTER EXAMINATION (2013-2014)

Total No of Questions: 6

Total No. of Pages: 2

Final Year B. Tech. (Electronics and Telecommunication)
Subject: (ET 411-2) Elective: RISC Microcontrollers and DSP Processors

[Time: 03 HOURS]

[Max. Marks: 60]

Year: 2013-14 (November 2013)

Instructions to candidates:

- 1) Answer all questions.
- 2) Neat Diagrams must be drawn wherever necessary.
- 3) Assume suitable data if necessary.
- 4) Figures to the right indicate full marks.
- 5) Use of non-programmable electronic calculator is allowed.

- Q.1 a) What are the functions carried by WIC, MPU and Bus Matrix components in the Cortex-M3 processor system? 5
- b) Explain how various faults related to interrupts are addressed in the Cortex-M3 processor. 5
- Q.2 a) Write and explain simple C program using RealView Development site which toggles a Light Emitting Diodes (LED). 6
- b) How SVC is useful to allow user applications to access the application programming interface (API) in an OS in Cortex-M3? 4
- Q.3 a) How various operations are simplified by BIT-BAND operation in the Cortex-M3? Explain. 4
- b) With the help of example showing contents of registers, SP, LR, Memory, Special registers before and after execution explain following instructions in Cortex -M3. 6
- (i) MOV R1, # 'D'
- (ii) LDRH Rd, [Rn, #offset]
- (iii) MSR CONTROL, R1
- (iv) STMDB.W Rd(!), <reg list>
- (v) BL Print Text
- Q.4(a) The functional unit in the following instructions are missing. List the same and explain your answer for C6X DSP processor family. 5
- MPY ??? B2, A1, B4
- ADD ??? A0, B1, A2
- [A1] B ??? LOOP

- (b) Write an assembly code for TMS320C6713 DSP processor to compute Euclidian distance between two points (3,4) and (6,8). 5
- Q.5(a) The memory content at address pointed by register A1 is to be loaded into register A10 and then moving the loaded data to A2. What is wrong with the following TMS320C6X processor code? 5
- LDW .D1 *A1,A10
MV .D1 A10,A2
- (b) Write assembly code for min-fuzzy, max-fuzzy and not-fuzzy operations using TMS320C6713 instruction set. 5
- Q.6(a) Explain with block diagram power down logic in DSP C6X processor. 5
- (b) What is the significance of bit-reversal addressing mode and indicate DSP applications where it has specific advantages. Does TMS3206X DSP processor family support this mode through instruction set. 5

OR

- (c) What will be the contents of register A2 after executing the following assembly code on TMS320C6713 DSP processor set in Little endian mode? Show the register contents with computational steps. 5

```
.text
MVKLH .S1 0x12345678, A9
MVKH .S1 0x12345678, A9
MVKLH .S1 0x80000000, A10
MVKH .S1 0x80000000, A10
STW .D1 A9,*A10
NOP 5
LDB .D1 *+A10[2],A2
NOP 5
.end
```

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