B.TECH SEM – VII (2007 COURSE) (ELECTRONICS ENGG.) :
WINTER - 2017

SUBJECT : ELECTIVE – I: DSP PROCESSORS

Day : **Wednesday** Time : **02.30 PM TO 05.30 PM**
Date : **24/01/2018** Max. Marks : 80

W-2017-2584

N.B.:

1) **Q.No.1 and Q.No.5** are **COMPULSORY**. Out of remaining questions attempt **ANY TWO** questions from each section.
2) Answers to both the sections should be written in **SEPARATE** answer books.
3) Figures to the right indicate **FULL** marks.
4) Assume suitable data if necessary.

SECTION - I

Q.1 **a)** State the advantages and disadvantages of floating point DSP processor rather than fixed point processor. **[05]**

b) Write in brief about the following software tools: **[05]**
i) C Compiler **ii)** Assembler **iii)** Linker.

c) What are the advantages of lattice structures over the other structures? **[04]**

Q.2 **a)** Which are the on-chip memories used in TMS 320C5X DSP processor? **[07]**

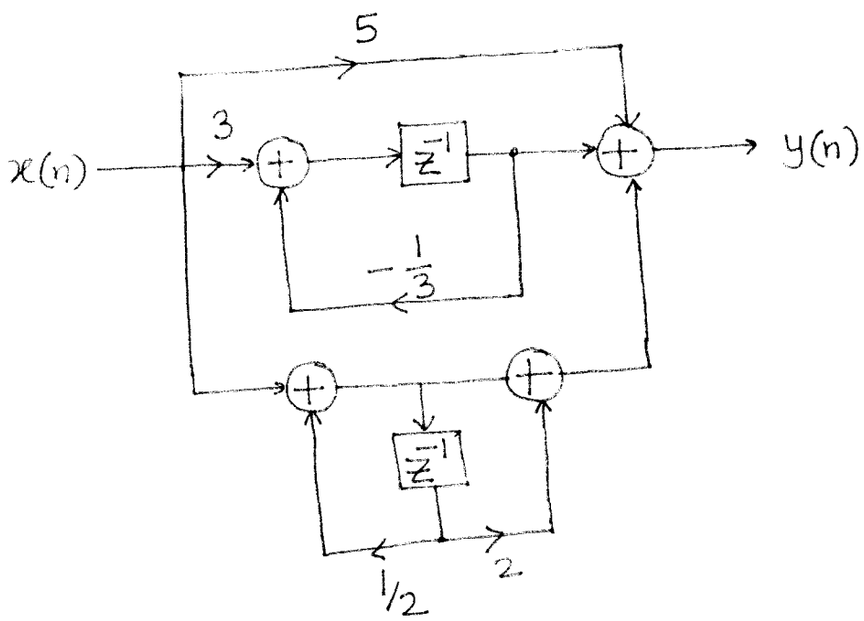
b) Explain in detail the architecture of TMS 320C5X processor. **[06]**

Q.3 **a)** Explain the memory architecture of ADSP 2181. **[07]**

b) Explain in detail the following: **[06]**
i) MAC **ii)** DAG

Q.4 **a)** Consider an FIR filter with system function **[07]**
$H(z) = 1 + 2.88z^{-1} + 3.4048z^{-2} + 1.74z^{-3} + 1.4z^{-4}$.
Sketch the direct form and lattice realizations of the filter and determine in detail the corresponding input – output equations.

b) Find the transfer function H(z) for the following figure. **[06]**



P.T.O.

SECTION - II

Q.5 **a)** State the applications of AR/ARMA filters. **[05]**

b) What is the relation between auto correlation and spectral density? **[05]**

c) What is the need for multirate signal processing? Give some examples. **[04]**

Q.6 **a)** Discuss and derive an expression for forward linear prediction with suitable diagram. **[07]**

b) Discuss the AR, MA and ARMA processes with their mathematical equations. **[06]**

Q.7 **a)** What are the differences between parametric methods and non-parametric methods for power spectrum estimation? Discuss the limitations of Non-parametric methods. **[07]**

b) Derive an expression for mean of periodgram estimate. **[06]**

Q.8 **a)** Explain the design of phase shifters as the application of multirate signal processing with neat diagram. **[07]**

b) Decimating x(n) by a factor of D = 2 produces the signal, $x_D(n)$. Show that $X_d(\omega) = X_s(\omega/2)$. Plot the signal $x_d(n)$ and its transform $X_d(\omega)$. **[06]**

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