F 3646 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Computer Science and Engineering

CS 010 504—DIGITAL SIGNAL PROCESSING (CS)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions. Each question carries* 3 *marks.*

1. What is the relationship between Z-transform and DFT ?
2. What are the differences and similarities between DIF and DIT algorithms ?
3. What are the desirable and undesirable features of FIR Filters ?
4. Distinguish analog and digital filters ?
5. List out the applications of DSP ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question caries 5 marks.

6. Discuss the properties of Z-transform ?
7. Write down the complexity of DFT calculation.
8. Write down the expression of Hanning window? Explain it.
9. Explain linear phase realization ?
10. Explain briefly about RADAR.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each question caries 12 marks

11. (a) Discuss in detail the important properties of the Discrete Fourier Transform..

Or

(b) Find the system function and the Impulse response of the System described by the difference equation

$y(n) = x(n) + 2x(n-1) - 4x(n-2) + x(n-3)$.

Turn over

12. (a) Compute the 8 pt DFT of the sequence $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ using DIT FFT.

Or

(b) Perform the circular convolution of the following *two* sequences :

$x_1[n] = \{2, 1, 2, 1\}$ and $x_2[n] = \{1, 2, 3, 4\}$.

13. (a) Design an ideal high pass filter with a frequency response

$$H_d(e^{jw}) = \begin{cases} 1 \text{ for } \frac{\pi}{4} \leq |\omega| \leq \pi \\ 0 \text{ for } |\omega| \leq \frac{\pi}{4} \end{cases}$$

Find the values $h(n)$ N = 11. Find H(Z).

Or

(b) Obtain cascade and parallel realization for the system having difference equation :

$y(n) + 0.1\,y(n-1) - 0.2\,y(n-2) = 3\,x(n) + 3.6\,x(n-1) + 0.6\,x(n-2)$.

14. (a) Explain impulse invariant method of designing IIR filter.

Or

(b) Discuss in detail about Butterworth approximations.

15. (a) Explain video compression in detail.

Or

(b) With neat sketch explain the architecture of TMS320C54.

(5 × 12 = 60 marks)