Roll No. .....

Total No. of Questions : 09]

[Total No. of Pages : 02

B.Tech. (ECE) (ETE) (Sem. - 5th)

DIGITAL SIGNAL PROCESSING

SUBJECT CODE : BTEC-502 (2011 Batch)

Paper ID : [A2104]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

1) Section - A is compulsory consisting of Ten questions carrying Two marks each.
2) Section - B contains Five questions carrying Five marks each and students has to attempt any Four questions.
3) Section - C contains three questions carrying Ten marks each and students has to attempt any Two questions.

Section - A

Q1)

a) Prove the final value theorem of Z - transform.

b) Differentiate energy signal and power signal.

c) Express the signal x(n) = {1 3 -2 4} in terms of unit step sequence u(n)

d) Prove scaling property of z transform

e) Explain time shifting property of DFT.

f) Define minimum phase transfer function.

g) What the advantages of direct form-II realization are over direct form-I realization of IIR filters?

h) What do you understand by notch filter?

i) What is the symmetry property of twiddle factor?

j) Define circular convolution.

Section - B

Q2) Illustrate the direct form realization of third order IIR transfer function

$$H(z)=\frac{0.44z^2+0.36z+0.02}{z^3+0.4z^2+0.18z-0.2}$$

Q3) A four point sequence x(n) = {1 ,2,3,4} has DFT X(k). Without performing DFT and IDFT, determine the signal which has DFT X(k-l).

Q4) Show that following systems are equivalent

i) $y(n)=0.2y(n-1)+x(n)-0.3x(n-1)+0.02x(n-2)$

ii) $y(n)=x(n)-0.1x(n-1)$

Q5) Explain the IIR filter design using bilinear transformation and impulse invariance techniques.

Q6) Explain the window technique of FIR filter design.

Section - C

Q7) The z transform $X(z)=\frac{3z}{z^2+0.3z-0.18}$ has three ROCs. Evaluate their respective inverse z transform corresponding to each ROC

Q8) Explain the Radix-2 DIT FFT algorithm. Discuss how calculations are reduced.

Q9) Discuss basic architecture of TMS series of digital signal processors.

⌘⌘⌘