EE - 503

B.E. V Semester

Examination, December 2015

Signals and Systems

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What is causality w.r.t a system?

   b) What you mean by singularity function.?

   c) Compare continuous time and discrete time signals.

   d) What do you understand by discrete convolution? List its properties.

   OR

   What are the steps involved in realization of LTI system? Explain with an example.

2. a) What is time domain and frequency domain representation of a signal?

   b) What are the limitations of Fourier transform?

   c) List the properties of Fourier transform.

   d) What do you mean by Parseval's theorem and where it is used. Explain in detail.

   OR

   What are the properties of continuous time LTI systems?

3. a) What is DFT? Express it mathematically.

   b) Express the relationship between DFT and the Fourier transfer.

   c) What are the properties of discrete Fourier series? Explain in detail.

   d) What do you understand by Frequency response of discrete time LTI system? Explain with an example.

   OR

   Define the Discrete Fourier Transform (DFT) and also mention its important features.

4. a) What is linear and non-linear system?

   b) List the properties of Laplace transform.

   c) What do you understand by Region Of Convergence (ROC). Give an example.

   d) Find the z transform of $x[n] = -a^n u[-n-1]$.

   OR

   Find the inverse Laplace of

   $$x(s) = \frac{2 + 2se^{-2s} + 4e^{-4s}}{s^2 + 4s + 3} \quad \text{Re}(s) > -1.$$

5. a) What do you mean by quantization step size?

   b) What is sample and hold circuit?

   c) What is the conditions for sampling frequency? Discuss.

   d) What are the steps involved in reconstruction of signal from its samples? Discuss with a suitable block diagram.

OR

What do you mean by Natural and flat-top sampling? Describe along with diagrams.

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