Total No. of Questions : 5] *[Total No. of Printed Pages : 2*

Roll No .....

EI/IC-7104

B.E. VII Semester

Examination, December 2016

Advanced DSP

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 do you understand by 'Imaging effect'?
   b) Define 'Decimation' and 'Interpolation' in Digital Signal Processing.
   c) Explain the concept of 'stability and causality'.
   d) Explain in brief the fundamentals of 'Multirate Systems'.

   OR

   What is 'aliasing effect'? What are the effects of aliasing on the signal? How can this effect can be reduced? Justify your answer using an example.

2. a) What is a 'filter bank'?
   b) Discuss 'Polyphase representation' of two channel filter banks.
   c) With an example, explain 'Tree structured filter banks'.
   d) Briefly explain 'M-channel' and 'two channel QMF' filter banks, with the help of suitable mathematical expressions.

   OR

   Explain the analysis and synthesis of filter bank with the help of examples.

3. a) Distinguish between 'anti-alias' and 'anti-image' filters.
   b) Sketch the basic block diagram of 'Digital Signal Processing system'.
   c) What are the advantages of 'pseudo-QMF filters'?
   d) Discuss the 'Cosine modulated filter banks' using suitable examples.

   OR

   Distinguish between 'Perfect Reconstruction' and 'Near Perfect Reconstruction' using suitable examples.

4. a) Compare 'Analog signal processing' with 'Digital signal Processing'.
   b) Enumerate two properties of autocorrelation.
   c) Discuss the filter bank properties induced by paraunitaries.
   d) Discuss the designing steps of 'Cosine Modulated Filter banks'.

   OR

   Discuss the designing steps of 'Paraunitary filter banks'.

5. a) What do you understand from 'coding gain'?
   b) List various types of noise in filter banks.
   c) What is 'Sub band Coding'? Discuss the basic principles of Sub band coding. Sketch the flow diagram of the sub band coding.
   d) Discuss the various types of quantization effects in digital signal processing.

   OR

   What are the standard techniques to reduce the 'Quantization Effects' in Digital Signal Processing?

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