Code: 17D06108

M.Tech I Semester Regular & Supplementary Examinations January/February 2019

ADVANCED DIGITAL SIGNAL PROCESSING

(Common to DECS, ECE & DSCE)

(For students admitted in 2017 & 2018 only)

Time: 3 hours Max. Marks: 60

Answer all the questions

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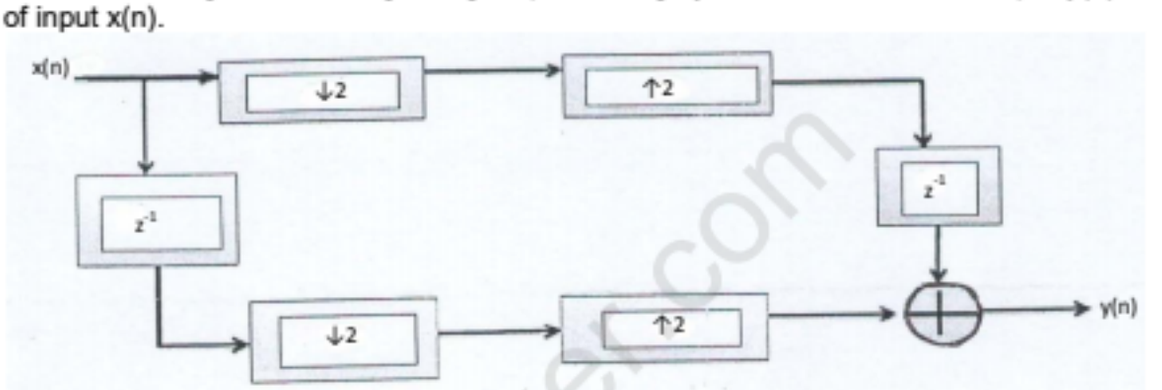
1 Explain about multistage implementation of sampling rate conversion.

OR

2 (a) For the following multi rate digital signal processing system, determine the output y(n) in terms of input x(n).



(b) An analog filter has the following system function $H(s) = 6/(S + 0.1))^2 + 9$, convert in to digital filter using backward difference.

3 Explain about analog to digital conversion. Also explain the effects of oversampling.

OR

4 Explain how multirate signal processing is used in the implementation of phase shifters.

5 In Welch method, calculate the variance of the Welch power spectrum estimate with the Bartlett window if there is 50% overlap.

OR

6 The Bias and variance of the modified periodogram is better than that of the ordinary periodogram. Justify your answer.

7 Explain the lattice filter realization of IIR filters.

OR

8 Derive the Wiener-Hopf equations for FIR wiener filter and also explain how it acts as a predictor.

9 Briefly describe the Yule Walker method of spectrum estimation for ARMA process.

OR

10 (a) State and prove Wiener-Khintchine theorem.

(b) Find the auto correlation to the PSD: $P(e^{jw}) = 3 + 2\ cos\ w$.

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