

Code: 13A04801

B.Tech IV Year II Semester (R13) Regular Examinations April 2017

ADAPTIVE SIGNAL PROCESSING

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

1 Answer the following: (10 X 02 = 20 Marks)

- (a) Find the Eigen values of the matrix $A = \begin{bmatrix} 3 & 0 & 0 \\ 5 & 4 & 0 \\ 3 & 6 & 1 \end{bmatrix}$.
- (b) Differentiate the open and closed loop adaption.
- (c) List the properties of wiener filter.
- (d) What are the advantages of kalman filter?
- (e) Summarize any two applications of LMS filters.
- (f) Write the expression for minimum sum of error squares.
- (g) Infer any two points related to convergence behavior of RLS algorithm.
- (h) Explain the approaches used in design of order recursive adaptive filters.
- (i) State any two applications of SVD method.
- (j) What are the practical considerations in blind deconvolution?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) Define adaptive system and explain with an example.
- (b) Discuss application areas of an adaptive system.

OR

- 3 How the Gradient operator helps to minimize the mean square error, explain with an example?

UNIT – II

- 4 Explain briefly the Levinson-Durbin algorithm and its applications.

OR

- 5 (a) Define and explain minimum mean square error for optimum filter.
- (b) Summarize the extended kalman filter algorithm.

UNIT – III

- 6 (a) Explain the principle operation of LMS algorithm.
- (b) Explain the properties of time average correlation matrix.

OR

- 7 (a) Explain briefly basic idea of the steepest descent algorithm.
- (b) Compare the LMS algorithm with steepest descent algorithm.

UNIT – IV

- 8 (a) Draw and explain the block diagram and signal flow graph of the RLS algorithm.
- (b) Discuss the simulation model for adaptive equalizer with neat diagram.

OR

- 9 Summarize the concept of QR-decomposition least squares lattice filtering with its properties.

UNIT – V

- 10 (a) State and explain various approaches to blind deconvolution.
- (b) Discuss the Sato algorithm.

OR

- 11 Interpret the concept of Bus Gang algorithm in blind equalization and explain how to solve blind equalization in the channel.