B.Tech IV Year II Semester (R13) Advanced Supplementary Examinations July 2017

**ADAPTIVE SIGNAL PROCESSING**

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 70

**PART - A**

(Compulsory Question)

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

(a) Determine the Eigen vector corresponding to the smallest Eigen value of the matrix.

$$A = \begin{bmatrix} 3 & 0 & 0 \\ 5 & 4 & 0 \\ 3 & 6 & 1 \end{bmatrix}$$

(b) Define adaptive system.

(c) What is the use of linearly constrained minimum variance method?

(d) Formulate the Kalman gain.

(e) Infer the importance of LMS filters in signal processing.

(f) State any two properties of time average correlation matrix.

(g) What is the fundamental difference between RLS and LMS algorithm?

(h) List any two operational advantages of QRD-LSL algorithm.

(i) Explain the functionality of SVD.

(j) Write the features of Bus-Gang algorithm.

**PART - B**

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

**UNIT - I**

2 (a) Summarize the characteristics of the adaptive system.

(b) With a neat sketch, explain the general form of adaptive linear combiner.

**OR**

3 Discuss the open and closed loop adaptation system with neat sketch.

**UNIT - II**

4 (a) Explain principle of orthogonality.

(b) Draw the block diagram for the Kalman filter and explain the significance of Kalman gain.

**OR**

5 Discuss in detail, properties of prediction error filter.

**UNIT - III**

6 Determine the condition for stability of the Steepest descent algorithm.

**OR**

7 (a) Discuss various data windowing methods.

(b) Explain the stability and performance analysis of LMS algorithm.

**UNIT - IV**

8 Elaborate the concept of convergence behavior of RLS algorithm with respect to mean and mean square value.

**OR**

9 Write a short note on the following: (a) Adaptive forward linear prediction. (b) Adaptive backward linear prediction.

**UNIT - V**

10 (a) Briefly discuss the blind deconvolution problem.

(b) Draw and explain the block diagram of blind equalizer.

**OR**

11 Write a short note on: (a) Sato algorithm. (b) Godard algorithm.



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