15EC652

Visvesvaraya Technological University, Belagavi
MODEL QUESTION PAPER
6th Semester, B.E (CBCS) EC/TC

Course: 15EC652 - ADAPTIVE SIGNAL PROCESSING

Time: 3 Hours **Max. Marks: 80**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or/and 2nd question.

		Module-1	Marks
1	a.	Explain the characteristics and applications of adaptive signal processing.	8
	b.	With a neat diagram explain open and closed loop adaptation.	8
		OR	
2	a.	Discuss about Principle of Orthogonality.	8
	b.	Derive augmented Wiener-Hopf equation for forward prediction.	8
		Module-2	
3	a.	Explain about Gradient Search methods.	5
	b.	Discuss about Stability and Rate of convergence Gradient Searching Algorithm	7
		OR	
4	a.	Compare Newton's & Steepest-descent methods in terms of speed adaptation and mis-adjustment.	10
	b.	Discuss about role of Learning curves.	6
		Module-3	
5	a.	Derive LMS adaptive algorithm.	8
	b.	Compare the LMS and the RLS algorithm	8
		OR	
6	a.	Determine the response of the system given by $y(n)=2.5y(n-1)-y(n-2)+x(n)-5x(n-1)+6x(n-1)$ to a input ( )	6
	b.	Prove Correlation properties of lattice Filter.	10
		Module-4	
7	a.	Discuss the working of spread spectrum communication system.	8
	b.	Explain how adaptive filters can be used for single input system identification	8
		OR	
8	a.	Illustrate how adaptive filters are used to measure earth's impulse response.	10
	b.	Express the relevance of the term spread spectrum when information is represented by pseudo random sequence.	6
		Module-5	
9	a.	Describe the two types of inverse modelling approaches.	8
	b.	Derive the least-square solution to inverse modelling problem.	8
		OR	
10	a.	Discuss about Cancellation of Echoes in long distance telephone circuits.	10
	b.	Explain how poles and zeros can be adapted for IIR filter synthesis.	6