Reg. No. : | | | | | | | | | | |

Question Paper Code: 49223

M.E. DEGREE EXAMINATION, MAY 2015.

Elective

Communication Systems

14PCM524 – APPLICATIONS OF DSP TECHNIQUES IN COMMUNICATION SYSTEM

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (5 x 1 = 5 Marks)

1. _____ adaptation methods are used in an echo canceller

   (a) RLS adaptation methods (b) CLMS methods

   (c) RPS methods (d) None of the above

2. The PICASSO SSFM transmitter to produce the required RF sounding waveform in the range of

   (a) 2-30 MHz (b) 50-75 KHz (c) 125-200 MHz (d) 60-85 KHz

3. The algorithm which is used to update the coefficients of the equaliser

   (a) Sobel algorithm (b) Gradient Descent algorithm

   (c) LMS algorithm (d) None of the above

4. _____ module provides the audio interface for the modem

   (a) DSP module (b) Microcontroller module

   (c) Speech Interface module (d) All the above

5. The bandwidth of the Doppler frequency B_{Du}= _____

   (a) λ/L (b) 2V/L (c) C/L (d) None of the above

PART - B (5 x 3 = 15 Marks)

6. List the applications of DSP in telecommunications.

7. Illustrate the software hierarchy of MOBIDICS.

8. Draw the block diagram of a GMSK transceiver.

9. Distinguish between punctured and non-punctured convolutional codes.

10. What is the relationship between radar beams and targets?

PART - C (5 x 16 = 80 Marks)

11. (a) Explain in detail about Echo cancellation in telecommunication systems. (16)

Or

(b) Discuss voice compression and waveform generation with suitable block diagram. (16)

12. (a) (i) How to calculate path loss in communication channels? (6)

(ii) Explain the functional block diagram of the digital frequency selective fading simulator. (10)

Or

(b) What are the development of a real time wide band channel simulator for Leo satellite channels. (16)

13. (a) Discuss in detail about adaptive CFAR tests for detection of a signal in noise and deflection criterion. (16)

Or

(b) Draw the block diagram of the system for Rician fading channel, explain in detail. (16)

14. (a) (i) Discuss the types of DSP based diversity modems. (8)

(ii) Briefly explain the interpolation techniques. (8)

Or

(b) Explain in detail about an eight-level-soft-decision SST- type viterbi error-trellis decoding system of punctured convolutional codes. (16)

15. (a) Explain in detail about data acquisition, sampling and power spectrum of radar image also draw the flow diagram of the range-doppler algorithm. (16)

Or

(b) (i) Distinguish between range-doppler and stolt interpolation on SAR data processing. (10)

(ii) Draw the block diagram of stolt interpolation algorithm. (6)

———————