

# CBCS Scheme

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16/17ECS14

First Semester M.Tech. Degree Examination, June/July 2018

## Advanced Digital Communication

Time: 3 hrs.

Max. Marks: 80

- Note: 1. Answer FIVE full questions, choosing one full question from each module.  
2. Use of Complementary Error Function on Table is permitted

### Module-1

- 1 a. Explain Quadrature amplitude modulation and derive  $d_{\min} = \frac{\sqrt{6 \log_2 M}}{M-1} \epsilon b_{\text{avg}}$  (06 Marks)  
b. Explain multidimensional signaling. (06 Marks)  
c. List the comparisons of PAM, PSK and QAM. (04 Marks)

OR

- 2 a. Explain continuous phase frequency shift keying. (08 Marks)  
b. Explain offset QPSK with necessary diagram. (08 Marks)

### Module-2

- 3 a. Obtain optimal detection for a general vector channel. (08 Marks)  
b. Explain matched filter receiver with M correlators. (08 Marks)

OR

- 4 a. Derive the error probability of PAM signaling. (08 Marks)  
b. Explain implementation of the optimal receiver for AWGN channel. (08 Marks)

### Module-3

- 5 a. With neat block diagram and relevant mathematical equation explain multichannel digital communication in AWGN channels. (08 Marks)  
b. Explain phase locked loop with relevant diagram and equations. (08 Marks)

OR

- 6 a. Describe decision directed loops with block diagram of double side band PAM signal receiver. (08 Marks)  
b. Explain the block diagram of a multi carrier communication system. (08 Marks)

### Module-4

- 7 a. Explain the effect of intersymbol interference on eye opening. (08 Marks)  
b. Explain linear equalization with linear transversal filter. (08 Marks)

OR

- 8 a. With a block diagram, explain an adaptive zero forcing equalizer. (08 Marks)  
b. With relevant block diagram and equations explain the LMS algorithm. (08 Marks)

### Module-5

- 9 a. With a block diagram, explain the model of spread spectrum digital communication system. (08 Marks)  
b. Explain block diagram of an independent tone FH spread spectrum system. (08 Marks)

OR

- 10 a. What is tracking and explain tracking loop for DLL. (08 Marks)  
b. Explain the applications of DS spread spectrum signals. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.