Hall Ticket Number:

Code No.: 5133 M

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

M.E. (CBCS : ECE) I-Semester Make up Examinations, March-2017

(Communication Engineering & Signal Processing)

Advance Digital Modulation Techniques

Time: 3 hours Max. Marks: 70

*Note: Answer ALL questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Compare ASK, FSK and PSK.
2. Draw the constellation diagram of QPSK.
3. Compare bandwidth and power spectra of BPSK and QPSK.
4. Discuss the significance of GMSK in mobile communication.
5. Name the impairments that affect the transmitted signal through AWGN channel.
6. Brief how carrier synchronization is established in OFDM.
7. Differentiate between slow and fast frequency hopping.
8. Write the characteristics of spreading codes.
9. What are Differential Space time block codes?
10. Outline the advantages of Smart antennas.

Part-B (5 × 10 = 50 Marks)

11. a) Describe about coherence type of BPSK modulation & detection of digital data. [7]
    b) Distinguish between coherence & Non coherence type of detectors. [3]
12. a) With the help of block diagrams explain the generation and detection of MSK signal. [5]
    b) Formulate the error performance of QAM signals over AWGN channel. [5]
13. a) Write about the parameters required for OFDM system design. Explain the working of OFDM system with transmitter and receiver block diagrams. [6]
    b) Illustrate Maximum-Likelihood carrier phase estimation. [4]
14. a) Elaborate the working of DS-SS system and its role in CDMA. [7]
    b) An information signal has 13 kbps spread over 1.25 MHz of B.W in BPSK, Find the Processing Gain. [3]
15. a) Discuss the different types of MIMO systems used in digital communication. [5]
    b) Explain multiple access techniques of digital communication. [5]
16. a) Draw & discuss about the power spectra of ASK, FSK and PSK modulation techniques. [5]
    b) With mathematical analysis explain the working of optimum receiver for CPM signals. [5]
17. Answer any ***two*** of the following:
    a) Equalization techniques [5]
    b) Near Far problem and Power Control [5]
    c) Space Division Multiple Access. [5]