Hall Ticket Number:

Code No.: 5123 M

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

M.E. I Year (ECE) I-Semester (Make Up) Examinations, March-2016

(Communication Engineering & Signal Processing)

Digital Modulation Techniques

Time: 3 hours Max. Marks: 70

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

Part-A (10 X 2=20 Marks)

1. Explain the power spectra of PSK and FSK techniques.
2. Compare bandwidth requirements in ASK, PSK and FSK.
3. Discuss M.S.K Modulation and demodulation with block diagrams.
4. Draw QAM constellation diagram.
5. Discuss the principle of orthogonal frequency division multiplexing.
6. Explain principle of maximum-likelihood carrier phase estimation.
7. A slow FH binary FSK system with non coherent detective operates at ε_b/J_0=05, with a hopping bandwidth of 2 GHz and a bit rate of 5kbits/s. What is the processing gain for the system?
8. Analyze outage probability of Maximum ratio combiner.
9. Explain tracking of FH.
10. Discuss Differential space time codes.

Part-B (5 X 10=50 Marks)
(All bits carry equal marks)

11. a) Discuss mathematical models used for communication channels.
    b) Describe features of matched filter and correlative receiver structures.

12. a) Obtain error performance for various binary signaling methods in AWGN channels.
    b) Analyze the performance of binary FSIC in M-ary PSK in AWGN channel.

13. a) Implement optimum receiver for AWGN channels.
    b) Explain about various equalization techniques.

14. a) Compare performance of BPSK and QPSK in AWGN channels.
    b) With suitable block diagram, discuss performance of CPM signals.

15. a) Compare Slow and fast frequency Hopping.
    b) Explain the system for acquisition of a DS and FH signals.

16. a) Show that implementation complexity of detector is minimized using with Alamouti code with multiple receiver antennas.
    b) Discuss spectral characteristics of multicarrier systems.

17. Write short notes on any two of the following:
    a) M-ary PSK receiver
    b) Scrambler
    c) SDMA

******