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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER M.TECH DEGREE EXAMINATION, DECEMBER 2017

Electronics & Communication Engineering

Telecommunication Engineering

01EC7313: Space Time Coding and MIMO Systems

Answer *any two full* questions from *each* part

Limit answers to the required points.

Max. Marks: 60 Duration: 3 hours

PART A

1. Derive the expression for capacity of a frequency flat deterministic MIMO channel. 9

2. Consider the MIMO channel with 9

$$H = \begin{bmatrix} 2 & 0 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

Find the channel capacity with channel unknown at the transmitter. Consider SNR = 100 dB.

3. Explain the different types of diversity combining techniques. 9

PART B

4. Derive the Trace criterion for space time block codes. 9

5. Obtain the beamformer for first input in a 1X2 MISO system ignoring noise, given h=[3+4j 1+j]. 9

6. Explain the encoding procedure of STTC. 9

PART C

7. Explain D-BLAST receivers. 12

8. With block diagram, explain MIMO OFDM. 12

9. Describe the equalization techniques in receiver design. 12