

Code No: 155BG

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2021

ERROR CORRECTING CODES
(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Draw and explain a typical data transmission or storage system.
- b) Find the entropy of a fair coin. [10+5]
- 2.a) Discuss Linear Block Codes and the relation between message block, code word block and parity bit block in detail.
- b) Draw the block diagram of general decoder for a linear block code and explain. [9+6]
3. Design an encoding and decoding circuit for the (7, 4) cyclic code generated by $1+X+X^3$. [15]
- 4.a) Draw the Convolutional Encoder for the following specifications:
Code Rate- 1/2, number of stages of shift register $m=3$, constraint length $k=3$, generator sequences $g_1 = (1, 1, 0, 1)$, $g_2 = (1, 1, 1, 1)$.
- b) Draw the state diagram and encode the message sequence 101001. [8+7]
5. Consider (4, 3, 2) convolutional code. Find the generator sequences of the code. Find the generator matrix G . Find the code word v corresponding to the information sequence $u = (110, 011, 110)$. [15]
6. Discuss the serial and parallel concatenation in UMTS turbo codes. [15]
7. Explain OSTBC encoding and decoding with examples. [15]
- 8.a) Discuss the applications of Convolution codes in ARQ system.
- b) Differentiate Real OSTBCs and Complex OSTBCs. [5+10]

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