



**APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY**  
**08 PALAKKAD CLUSTER**

Q. P. Code :CE0818232-P

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Name .....

Reg. No.....

**SECOND SEMESTER M.TECH. DEGREE EXAMINATION APRIL 2018**

**Branch: Electronics & communication Engg. Specialization: CESP/ECE**

**08EC 6232/6532 CODING THEORY**

**Time:3 hours**

**Max.marks: 60**

**Answer all six questions.**

**Modules 1 to 6:** Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	What is primitive element and explain minimum polynomial	3
<b>Answer b or c</b>		
b	i) Explain the Field with suitable example ii) Check whether the set (0,1) is a field of two elements with modulo-2 addition & modul-2 multiplication	6
c	Construct a Galoise field $GF(2^3)$ using suitable irreducible polynomial	6

Q.no.	Module 2	Marks
2.a	Explain the linearity property of the block codes	3
<b>Answer b or c</b>		
b	The parity check equations of a (7,4)LBC is given by $P_0=m_1+m_2+m_3$ $P_1=m_1+m_2+m_4$ $P_2=m_1+m_3+m_4$ Find the minimum distance of the block code	6
c	What is syndrome? Explain the syndrome decoding procedure with suitable example	6

**Q.no.** **Module 3** **Marks**

**3.a** What are Hamming codes **3**

**Answer b or c**

**b** Explain the Coding & Decoding of BCH codes **6**

**c** i) Explain the features of Reed Solomon codes **6**

ii) Explain the decoding of Reed Solomon codes

**Q.no.** **Module 4** **Marks**

**4.a** Compare linear Systematic & Non-systematic codes **3**

**Answer b or c**

**b** The generator polynomial for a (7,4) cyclic code is given by  $1+X^2+X^3$  find All the codewords **6**

**c** i) What is minimum distance **6**

ii) Explain how the minimum distance is significant in determining the error detection & correction capabilities of a cyclic code

**Q.no.** **Module 5** **Marks**

**5.a** What are convolutional codes? Why are they called so? **4**

**Answer b or c**

**b** The impulse response for different paths of a convolutional encoder with three adders are given by (1,1,0), (1,0,1), (1,1,1) Find the encoder output for the input pattern (11101) **8**

**c** Assuming suitable convolutional encoder, Draw state diagram, tree diagram & trellis diagram **8**

**Q.no.** **Module 6** **Marks**

**6.a** Explain the concept of Turbo codes **4**

**Answer b or c**

**b** Explain maximum likelihood decoding of convolutional codes **8**

**c** i) Illustrate the concept of Viterbi algorithm by assuming suitable example **8**

ii) Explain the concept of sequential decoding