## Code No.: 22557

## VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

## M.E. (E.C.E.) II-Semester Main Examinations, September-2022

## **Coding Theory and Techniques**

(Communication Engineering & Signal Processing)

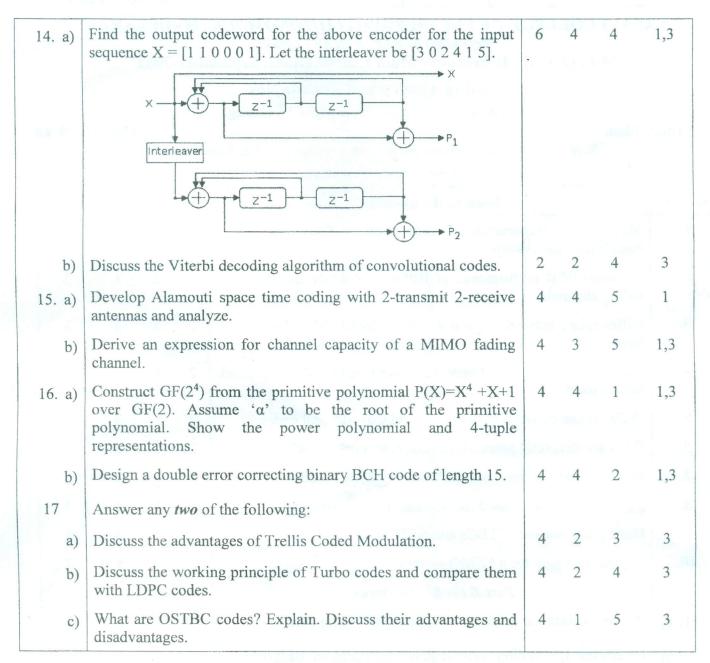
Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A  $(10 \times 2 = 20 \text{ Marks})$ 

$Part-A (10 \times 2 - 20 Marks)$							
Q. No.	Stem of the question	M	L	CO	PO		
1.	Mention the importance of Error Control Codes in digital communication system.	2	1	1	3		
2.	Compare BER performance of BPSK in AWGN and Rayleigh fading channels.	2	2	1	3		
3.	Differentiate between regular and irregular LDPC codes with an example.	2	2	2	3		
4.	Give the relationship between generator matrix and parity check matrix for linear block codes.	2	1	2	3		
5.	Differentiate between Block codes and Covolutional codes.	2	2	3	3		
6.	What are structural properties of convolutional codes?	2	1	3	3		
7.	Bring out the necessity of interleaver in Turbo decoders.	2	1	4	3		
8.	List the components used for generation of Turbo codes.	2	1	4	3		
9.	Distinguish between STBCs and STTCs	2	2	5	3		
10.	Explain rate gain for a MIMO system.	2	1	5	3		
	Part-B $(5 \times 8 = 40 \text{ Marks})$						
11. a)	Briefly explain the diversity techniques for fading channels.	4	2	1	3		
b)	Determine the coding gain required to maintain BER of 10 <sup>-3</sup> when the received E <sub>b</sub> /N <sub>o</sub> remains fixed and the modulation format is changed from BPSK to 8-PSK in AWGN channel.	4	3	1	3,4		
12. a)	Construct Parity check and generator matrices for (7,4) Hamming code.	4	3	2.	4		
b)	Explain the procedure of constructing LDPC codes using Galleger's method.	4	2	2	4		
13. a)	Differentiate between recursive and non-recursive convolutinal encoders with example.	2	2	3	3		
b)	The impulse responses of a convolutional encoder are given by g1=[101], g2=[111], g3=[110].	6	4	3	1,3		
	(i) Construct the corresponding encoder (ii) Construct the state diagram						



M: Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	35%
iii)	Blooms Taxonomy Level – 3 & 4	45%

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