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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Sixth Semester, B.E. - Electronics and Communication Engineering
Semester End Examination; May / June - 2018
Error Control Coding

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a.	Explain the block diagram of a data transmission or storage system.	8
b.	Explain briefly the types of codes.	4
c.	Define vector space and list the properties of vector space over a field *F*.	8
2 a.	Explain the error control strategies for a two-way system.	6
b.	Define: i) Groups ii) Fields iii) Characteristic of the field	8
c.	Explain the simplified model of channel with memory.	6

UNIT - II

3 a.	With a neat diagram, explain the basic turbo encoding structure.	7
b.	With a neat diagram, explain parallel concatenated block code.	6
c.	With a neat diagram, explain the basic structure of an iterative turbo decoder.	7
4 a.	Explain the performance analysis of turbo codes.	10
b.	Briefly summarized the iterative decoding using the Log-MAP and Max-Log-MAP algorithms.	10

UNIT - III

5 a.	Define an LDPC code. Write the parity check matrix of (15, 7) LDPC code.	7
b.	Explain briefly about decoding of LDPC codes.	8
c.	Explain briefly to construct the parity check matrix H_{GA} of Galleger LDPC code.	5
6 a.	Explain briefly the decoding of Bit-Flipping and sum product algorithm.	10
b.	Explain briefly the Geometric construction of LDPC codes.	10

UNIT - IV

7 a.	Write the encoder diagram and error trellis for two (2, 1, 2) binary convolutional codes.	8
b.	With a neat diagram, explain about general TCM encoder diagram and signal mapper.	7
c.	What are the advantages of Multi-D TCM systems over 1-D and 2-D TCM systems?	5
8 a.	Explain briefly the three basic steps in designing TCM systems.	10
b.	Realize the rotationally invariant 16-state rate R = 2/3 8-PSK encoder.	10

UNIT - V

9 a.	With a neat diagram, explain briefly about error-trapping decoder for burst-error correcting codes.	10
b.	Write a note on: i) Fire codes ii) Burton codes	10
10 a.	With a neat diagram, explain the three basic types of ARQ scheme.	10
b.	With a neat diagram, explain the normal state operation of the receiver.	10

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