

Total No. of Questions : 8]

SEAT No. :

P2383

[4758] - 541

[Total No. of Pages : 2

T.E. (E & TC)

INFORMATION THEORY AND CODING TECH.

(2012 Course) (End - Sem.) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or 2, 3 or 4, 5 or 6, 7 or 8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- 4) Assume suitable data, if necessary.

Q1) a) Design a Shannon-Fano code for a source generating 5 different messages with probabilities 0.45, 0.3, 0.15, 0.05, 0.05. Find the coding efficiency. [7]

b) What are interleaved codes? Explain with suitable example. [7]

c) Write the procedure for decoding a cyclic code. [6]

OR

Q2) a) What is Run length encoding? Explain how it is used in bitmap file formats. [7]

b) What are single parity check codes? Write about the decoding performance of these codes. [7]

c) What is CRC code? Explain how are they generated? [6]

Q3) a) Find the generator polynomial for (7, 4) BCH code. Use primitive polynomial $x^3 + x + 1$. [10]

b) What are RS-codes? Write features & applications of Rs. codes. [6]

OR

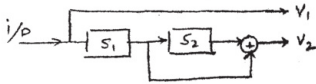
Q4) a) The received code polynomial for a (7, 4) BCH code is $r(x) = x^6 + x^4 + x^3 + x^2$. Find the corrected codeword polynomial if single error has occurred. [8]

b) What are cyclic hamming codes? Give one example of cyclic hamming code. [4]

c) Explain stop-and-wait ARQ. [4]

P.T.O.

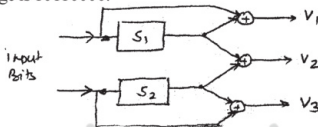
- Q5) a) Draw state diagram for following convolutional encoder. [6]



- b) Explain with suitable example generator polynomial description of convolutional codes. [8]
 c) Write a short note on Turbo codes. [4]

OR

- Q6) a) For the following convolutional encoder, find the coded output if input message is 10110000. [8]



- b) What is sequential decoding? Explain in brief. [6]
 c) Write a short note on LDPC codes. [4]

- Q7) a) Explain how the goals of the communication system designer are conflicting. [6]
 b) What is bandwidth efficiency plane? Explain different regions in the plane. [6]
 c) Write Ungerboeck's TCM design rules. [4]

OR

- Q8) a) What is error probability plane? Indicate various trade-offs on this plane. [6]
 b) What is coding gain in TCM encoder? How it is calculated? [6]
 c) What are typical design specifications of communication system? What techniques are used when [4]
 i) Power is limited
 ii) Bandwidth is limited

