Total No. of Questions : 8]

SEAT No. :

P2383

[Total No. of Pages :2

[4758] - 541
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

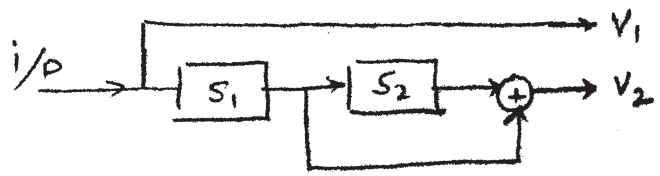
Q4) a) The received code polynomial for a (7, 4) BCH code is $r(x) = x^6 + x^4 + x^3 + x^2$. Find the corrected codeword polynomial if single error has occured. **[8]**

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]**

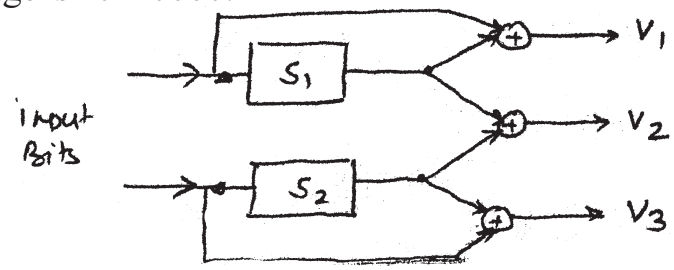


b) Explain with suitable example generator polynomial description of convolutional codes. **[8]**

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 inTCM 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