JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T2 EXAMINATION- OCT. 2019

B.Tech. V Sem. (CSE/IT)

COURSE CODE: 18B1WCI531　　　　　　　　　　　　　　　　MAX. MARKS: 25
COURSE NAME: Information Theory and Coding
COURSE CREDIT: 02　　　　　　　　　　　　　　　　　　　　MAX. TIME: 1.30 HR.

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1. For the channel matrix given, find the missing entries. Also draw the corresponding channel diagram.

$$\text{Channel Matrix} = P\left(\frac{y}{x}\right) = \begin{array}{c} x_1 \\ x_2 \\ x_3 \end{array} \begin{bmatrix} 0.8 & ? & 0.2 \\ ? & 0.6 & 0.2 \\ 0.2 & 0.3 & ? \end{bmatrix} \begin{array}{c} y_1 \quad y_2 \quad y_3 \end{array}$$

[5]

Q2. (a) What are systematic and non-systematic cyclic codes. Give its algebraic description. [3]

(b) Identify (n.k) values of a cyclic code generated by the generator polynomial $g(x)=1+x+x^2+x^3$ [3]

Q3. Consider a (7, 4) cyclic code with generator polynomial $g(x)=1+x+x^3$. Obtain the all possible code polynomials. [5]

Q4. Differentiate among the following terms: [3]
　　　(i) Static and adaptive coding.
　　　(ii) Lossy and lossless compression
　　　(iii) Monic and non-monic polynomial

Q5. Encode "hello world" string with adaptive Huffman coding. Give the steps with the tree updation also.
　　　　Note: space between words "hello" and "world" should also be encoded. [6]