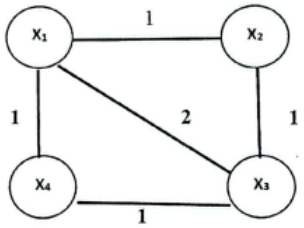
INDEX

<table>
<tr><th>Ex. No.</th><th>Name of the Experiment</th><th>Page No.</th></tr>
<tr><td>01</td><td>Write a program to implement Huffman code using symbols with their corresponding probabilities.</td><td></td></tr>
<tr><td>02</td><td>Write a program to simulate convolutional coding based on their encoder structure.</td><td></td></tr>
<tr><td>03</td><td>Write a program to implement Lempel-Ziv code.</td><td></td></tr>
<tr><td>04</td><td>Write a program to implement Hamming code.</td><td></td></tr>
<tr><td>05</td><td>A binary symmetric channel has the following noise matrix with probability,
$P(Y/X) = \begin{bmatrix} \frac{2}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{2}{3} \end{bmatrix}$. Now find the Channel Capacity C.</td><td></td></tr>
<tr><td>06</td><td>Write a program to check the optimality of Huffman code.</td><td></td></tr>
<tr><td>07</td><td>Write a code to find the entropy rate of a random walk on the following weighted graph
 
</td><td></td></tr>
<tr><td>08</td><td>Write a program to find conditional entropy and join entropy and mutual information based on the following matrix.
<table>
<tr><th>Y \ X</th><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>1</td><td>$\frac{1}{8}$</td><td>$\frac{1}{16}$</td><td>$\frac{1}{32}$</td><td>$\frac{1}{32}$</td></tr>
<tr><td>2</td><td>$\frac{1}{16}$</td><td>$\frac{1}{8}$</td><td>$\frac{1}{32}$</td><td>$\frac{1}{32}$</td></tr>
<tr><td>3</td><td>$\frac{1}{16}$</td><td>$\frac{1}{16}$</td><td>$\frac{1}{16}$</td><td>$\frac{1}{16}$</td></tr>
<tr><td>4</td><td>$\frac{1}{4}$</td><td>0</td><td>0</td><td>0</td></tr>
</table></td><td></td></tr>
</table>

Pabna University of Science & Technology

Department of
Information and Communication Engineering
Faculty of Engineering and Technology

Lab Report

Course Title: Information Theory and Coding Sessional

Course Code: ICE-4106

Submitted By:	**Submitted To:**
Name: Shahanur Rahman **Roll: 190617** **Session: 2018-2019** **4th Year 1st Semester,** **Department of ICE,** **Pabna University of Science and Technology.** **Submission Date: 02-03-2024**	**Sohag Sarker** **Associate Professor** **Department of ICE,** **Pabna University of Science and Technology.** **Teacher's Signature:**