JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-VIII Semester (ECE)

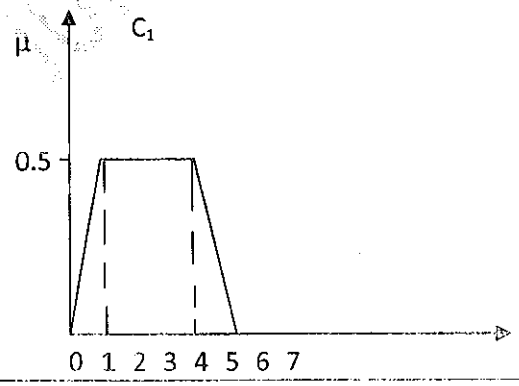
COURSE CODE (CREDITS): 24B1WEM831(2) MAX. MARKS: 15

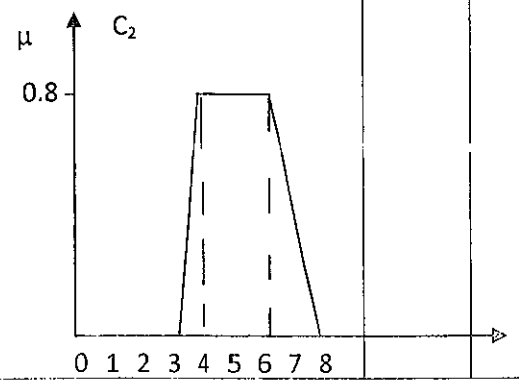
COURSE NAME: SOFT COMPUTING PARADIGMS

COURSE INSTRUCTORS: Munish Sood MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

<table>
<tr><th>Q.No</th><th>Question</th><th>CO</th><th>Marks</th></tr>
<tr><td>Q1</td><td>Suppose we have a simple fuzzy inference system to determine the wash time of a domestic dish washer. Using Mamdani's approach design a controller to determine the wash time of a domestic dish washer. Assume the input as dirt and grease on utensils. Use three descriptors for input variables and five for output variable. Find out the wash time for 60% dirt and 10% grease.</td><td>2</td><td>4</td></tr>
<tr><td>Q2</td><td>Find the membership value assignment using Rank Ordering for the pair wise consumer preference for a brand of cars as given in the following table
<table>
<tr><th></th><th>BMW</th><th>Benz</th><th>Jaguar</th><th>Audi</th><th>Rolls Royce</th></tr>
<tr><td>BMW</td><td>--</td><td>51</td><td>54</td><td>52</td><td>67</td></tr>
<tr><td>Benz</td><td>48</td><td>--</td><td>47</td><td>84</td><td>58</td></tr>
<tr><td>Jaguar</td><td>46</td><td>62</td><td>--</td><td>14</td><td>53</td></tr>
<tr><td>Audi</td><td>45</td><td>53</td><td>47</td><td>--</td><td>64</td></tr>
<tr><td>Rolls Royce</td><td>26</td><td>42</td><td>40</td><td>38</td><td>--</td></tr>
</table></td><td>1</td><td>3</td></tr>
<tr><td>Q3</td><td>Using center of sums method for defuzzification, find the union of two fuzzy sets given by the following figure



</td><td>2</td><td>4</td></tr>
</table>

Q4	Consider two fuzzy sets $A_{\sim} = \left\{\frac{0.5}{2.0} + \frac{0.45}{4.0} + \frac{0.25}{6.0} + \frac{0.75}{8.0} + \frac{1}{10.0}\right\}$ $B_{\sim} = \left\{\frac{0.6}{2.0} + \frac{0.35}{4.0} + \frac{0.5}{6.0} + \frac{0.35}{8.0} + \frac{0.5}{10.0}\right\}$ Calculate (i) $\overline{A_{\sim} \cup B_{\sim}}$ (ii) $A \cap \overline{A_{\sim}}$	1	4