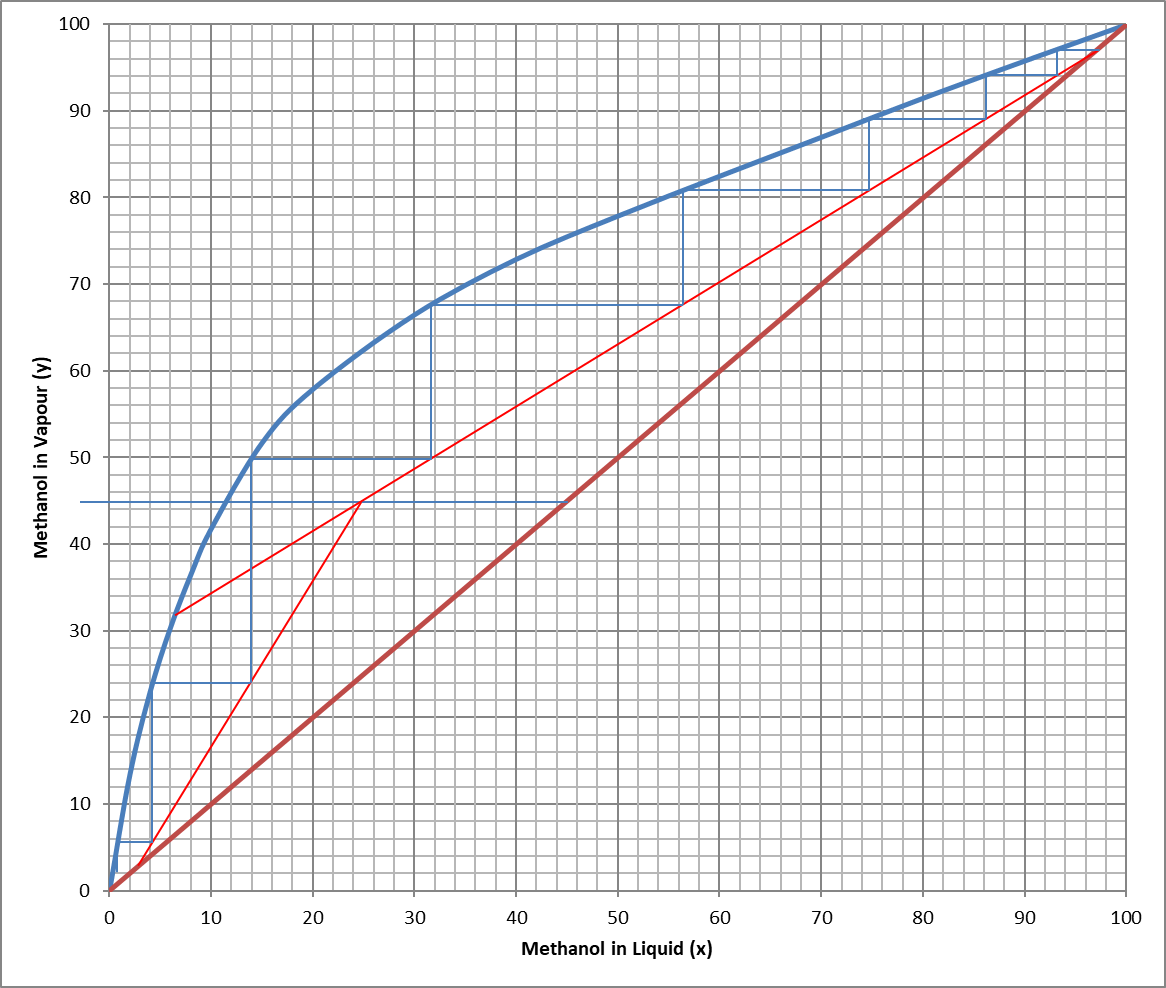
**RECORD YOUR RESPONSE IN THE SPACE PROVIDED UNDER EACH SUBQUESTION**

**BQ2: Distillation: 10 Marks**

Fig. BQ2 provides an equilibrium data for the methanol-water distillation system and a solution to a methanol-water distillation problem using McCabe-Thiele method. Answer the following questions based on Fig. BQ2 –



**Figure BQ2**

a) Determine the vapour fraction in the feed. In addition, briefly explain the significance of the feed condition on the operation of the distillation column (maximum 100 words). **2 Marks**

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| Response: |

b) Determine the approximate composition of water in the vapour and liquid phases leaving the feed stage. **2 Marks**

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| Response: |

c) Determine the approximate compositions of methanol in the vapour and liquid phases entering stage 4. **2 Marks**

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| Response: |

d) Determine the relative volatility of methanol at stage 5. **2 Marks**

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| Response: |

e) To estimate the minimum number of equilibrium stages, the rectifying (enriching) and stripping operating lines coincides with the line. Using theoretical and analytical reasoning, briefly describe the reasons for this condition of the operating lines. **2 Marks**

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| Response: |

**END OF QUESTION BQ2 (Go to next page)**