Quiz 3 (5 marks, 40 mins) (*November 5*) **ACOL215, IITD-AD, Aug-Dec 2025**

Name: **Entry No.:**

Show all the steps in your solution clearly. Writing the final answer directly would not fetch any marks.

1. **[1 marks]** Draw the logic diagram of a 2-to-4-line decoder using NOR gates only. You may use inverters if required. Include an enable input.
2. **[1 marks]** Specify the truth table of an octal-to-binary priority encoder. Provide an output V to indicate that at least one of the inputs is present. The input with the highest subscript number has the highest priority. What will be the value of the four outputs if inputs D_3 and D_5 are 1 at the same time (while all others are 0)?
3. **[1.5 marks]** Recall the construction of D (transparent) latch using four NAND gates and an inverter. Your task is to contruct the same latch using NOR gates for all the four gates. You may need inverters additionally. Draw the logic diagram and argue briefly that your construction is correct.
4. **[1.5 marks]** Write the truth table of a full subtractor, and implement it using two 4×1 multiplexers. Draw the logic diagram (use block diagrams for the multiplexers).