Q2) For a given Boolean function **F** which has "don't care" conditions as

$$F(A,B,C,D) = \Sigma m \ (3,6,8,11,12,13,14,15) + \Sigma d \ (0,1,5,7)$$

(a) Optimize **F** in the sum-of-products (SOP) form. Calculate Gate Input (G) cost.
(b) Implement **F** with NAND gates only.
(c) Optimize **F** in the product-of-sums (POS) form. Calculate Gate Input (G) cost.
(d) Implement **F** with NOR gates only.