

**National University**



of Computer



and



Emerging Sciences



Chiniot



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Faisalabad Campus



**EE1005 – Digital Logic Design**

**Quiz# 4**

**Instructor:** Muhammad Adeel Tahir **Section:** SE-2A **Time:** 30 Minutes

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

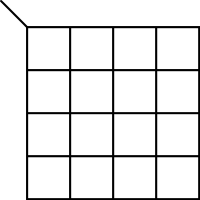
**Roll No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total: 20 marks**

***Instructions:*** *Make sure the handwriting is neat and clean while drawing the circuit, quiz will be marked as 0 if attempted in a writing that is not readable at all.*

**Q:** In a simple copy machine, a stop signal, S, is to be generated to stop the machine operation and energize an indicator light whenever either of the following conditions exists: (1) there is no paper in the paper feeder tray; or (2) the two microswitches in the paper path are activated, indicating a jam in the paper path. The presence of paper in the feeder tray is indicated by a HIGH at logic signal P. Each of the microswitches produces a logic signal (Q and R) that goes HIGH whenever paper is passing over the switch to activate it. Design the logic circuit to produce a HIGH at output signal S for the stated conditions, and implement it using two input NAND gates only. **(10 marks)**

**No of Inputs: \_\_\_\_\_\_\_\_\_\_\_ No of Outputs: \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Equation F: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Truth Table:**

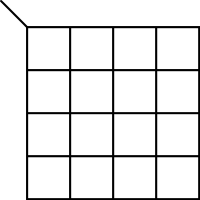
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**Draw neat and clean diagram otherwise a 0 will be awarded, label each output carefully.**

**Q:** An analog-to-digital converter is monitoring the DC voltage (VB) of a 12-V storage battery on an orbiting spaceship. The converter’s output is a four-bit binary number, ABCD, corresponding to the battery voltage in steps of 1 V, with A as the MSB. The converter’s binary outputs are fed to a logic circuit that is to produce a HIGH output if the binary value is greater than 6; that is, the battery voltage is greater than 6 V. Design this logic circuit. **(10 marks)**

**No of Inputs: \_\_\_\_\_\_\_\_\_\_\_ No of Outputs: \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Equation F: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Truth Table:**

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**Draw neat and clean diagram otherwise a 0 will be awarded, label each output carefully.**