ID 712 MAJOR 8-5-07

MAX MARKS 60

MAX TIME 2 HRS.

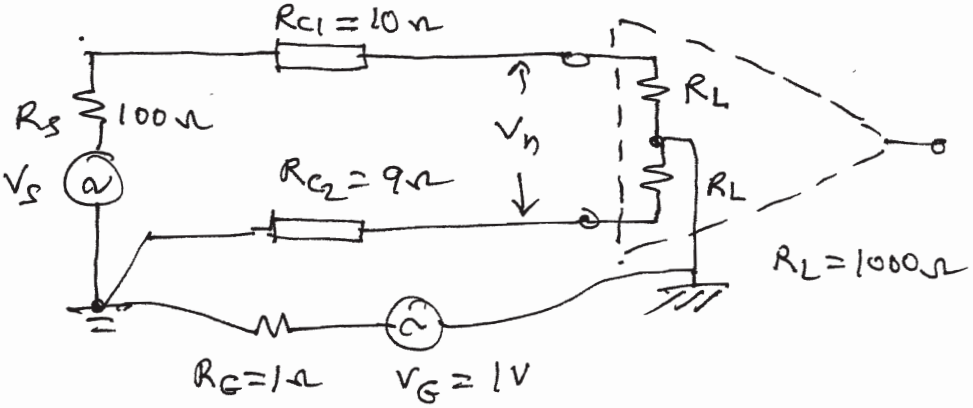
Answer all Questions. Be brief. Give neat diagram.

Q.1 (a) Explain the problem of ground loop interference in instrumentation (10)

(b) Give ckt diagram each for breaking ground loop using (i) magnetic coupling (ii) opto coupling (iii) direct coupling between modules.

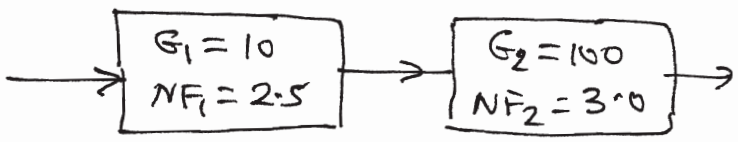
(c) Compare the three techniques above for their frequency response

Q.2 (a) Calculate noise induced V_n, due to ground loop voltage V_G for single ended source and double ended receiver module. (5)

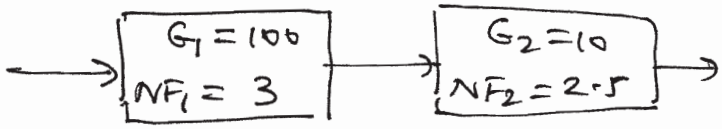


(b) For power gains G_1, G_2, and noise figures in combinations below, which will have the least noise figure. Calculate this minimum Noise figure value.

(a) (5)

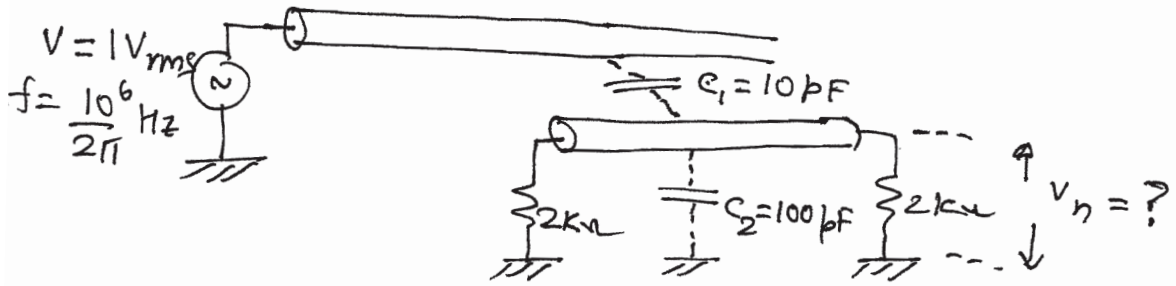


(b)

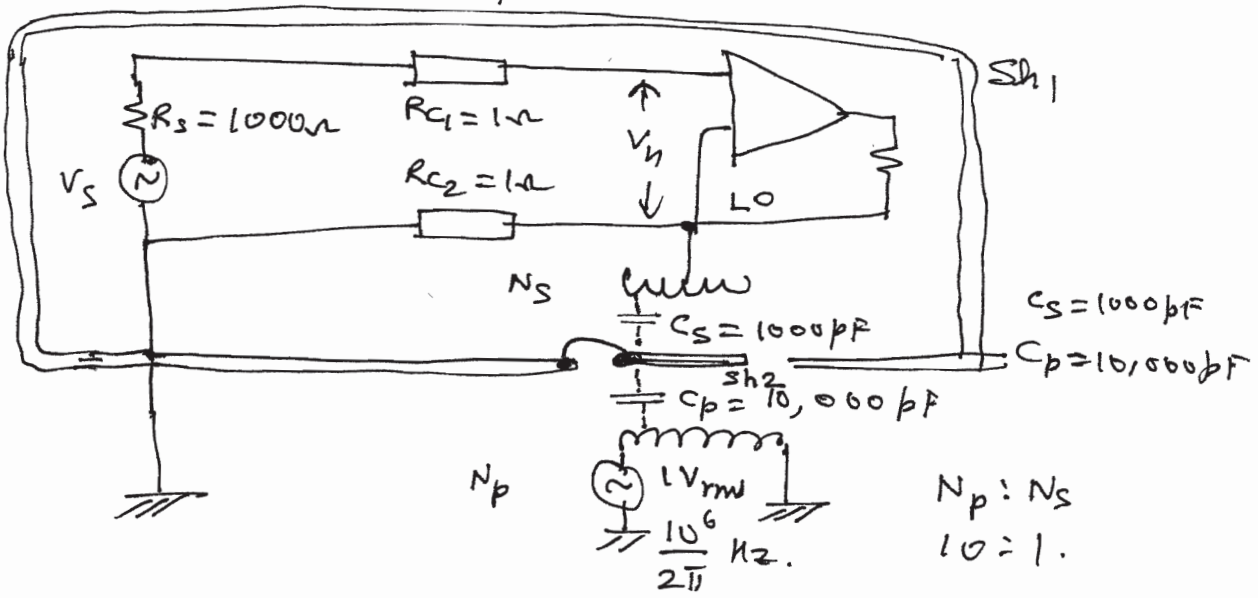


Q-3 (a) Calculate the noise induced V_n due to capacitive coupling, for ckt & stray capacitances given below. (5)

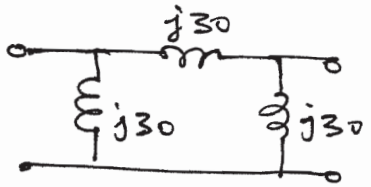
(b) What is worst case induced noise V_n



(c) Calculate the noise voltage V_n, when the sheild of transformer is connected to sheild of circuit, with values of capacitances provided below. (5)



Q-4 (a) Compute Z_{11}, & Y_{11} for ckt below. Is $Z_{11} = \frac{1}{Y_{11}}$? Explain. (5)



(b) Explain how a suitable probe can measure reflected voltage in a co-axial cable (5)

(c) Explain why sheilding is insufficient in magnetic interference. Explain measures (5)

5. What is multiplying A/D Converter ? How its two quadrant operation can be extended to make it work as four quadrant multiplier. Explain with diagram (4)

6. What are the basic concepts used in Delta-Sigma A/D Converter. Explain with diagram, how large bit representation is achieved. (6)

7. (a) Describe how 'Flow Control' works for Serial Transmission. (2)

(b) Describe in brief the standard modes of operation of PC parallel port. (3)

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