

College of Electronic Technology / Tripoli

Date: // / / 2020

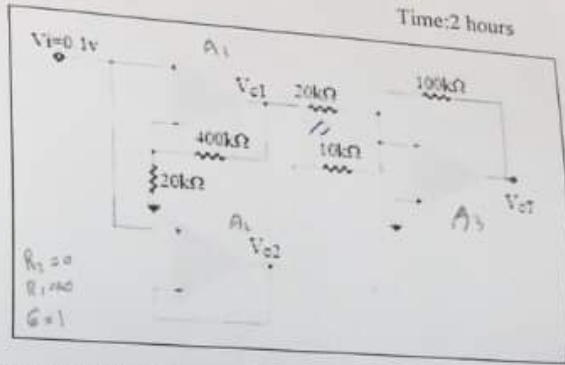
The midterm exam of electronic circuit III

inserting -

Time: 2 hours

- 1) Calculate the voltage V_{o1} , V_{o2} and V_{oT} of the circuit. (5 points)

$$= \frac{1}{CR} \int v_{in} dt$$



- 2) Use an ideal op amp to design an inverting integrator with an input resistance of 100 kΩ and an integration time constant of 10⁻³ s. Draw the circuit? (5 points)

- 3) It is required to connect a 10V source with a source resistance of 100kΩ to a 1kΩ load. Find the load voltage, the load current and where does the load current come from in each case? (Draw the circuits) (5 points)

IF: (a) The source is connected directly to the load. (2.5 points)

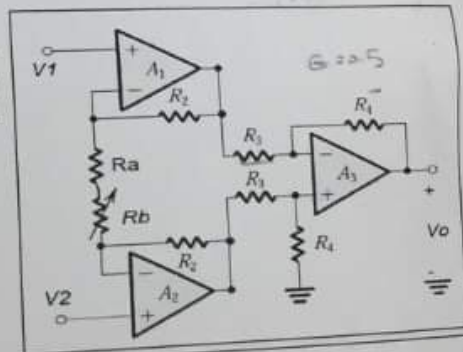
(b) A unity-gain op-amp buffer is inserted between the source and the load. (2.5 points)

- 4) Design the instrumentation-amplifier circuit of to realize a differential gain variable in the range 1 to 100, using a 100kΩ pot as variable resistor. (Note: Design the second stage for a gain of 0.5). (5 points)

$$G = \frac{R_{22}}{R_3} \left(\frac{R_2}{R_1} \right) \frac{R_4}{R_1} \quad R_{22} = R_2$$

special case

$$\frac{R_4}{R_3} = 0.5$$



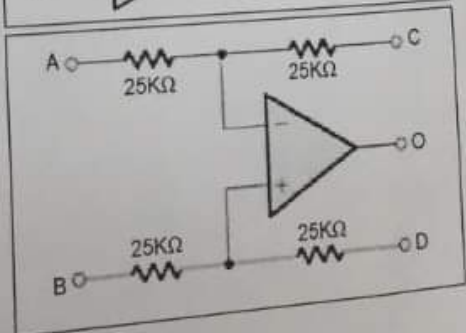
- 5) The circuit can be configured for a variety of applications by the suitable connection of terminals A, B, C, D, and O. Avoid leaving a terminal open-circuit. Show how the circuit with gains and prove? (note: single input single output)

a) -1 V/V (2.5 points)

b) +1 V/V (2.5 points)

c) +2 V/V (2.5 points)

d) +0.5 V/V (2.5 points)



good luck