

Questions Bank of Electrical Measurements

Q1. A 0 to 150V voltmeter has accuracy of 1% of full scale reading. The theoretical (true) expected value we want to measure it is 83V. Determine the practical (measured) value and the percentage of error.

Q2. Derive the basic basic Unit for a Capacitance

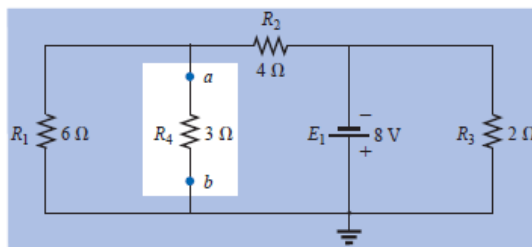
Q3. A Resistor R1 has a potential difference of 25 V across its terminals, and a current of 63 mA. A voltage is measured on 30 V analogue instrument with an accuracy of $\pm 5\%$ of full scale. The current is measured on a digital instrument with a ± 1 mA accuracy. Calculate the resistor R1 and specify its tolerance.

Q4. Derive the basic basic Unit for an Inductance

Q5. An electrostatically cathode ray tube has plane parallel deflecting plates which are 2.5 cm long and 0.5 cm apart, and the distance from their centre to the screen is 20 cm. The electron beam is accelerated by a potential difference of 2500 V and is projected centrally between the plates. Calculate the deflecting voltage required to cause the beam strike the end edge of the deflecting plate and find the corresponding deflection on the screen.

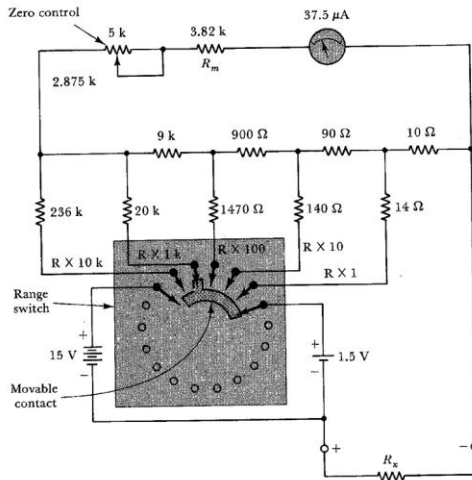
Q6. If $(R_1 = 200 \Omega \pm 2\%)$ and $(R_2 = 100 \Omega \pm 5\%)$, then both resistors are connected in parallel, find the resultant resistance and specify its tolerance.

Q7. Find the current passing through and voltage across R_4 using Thevenin theorem.

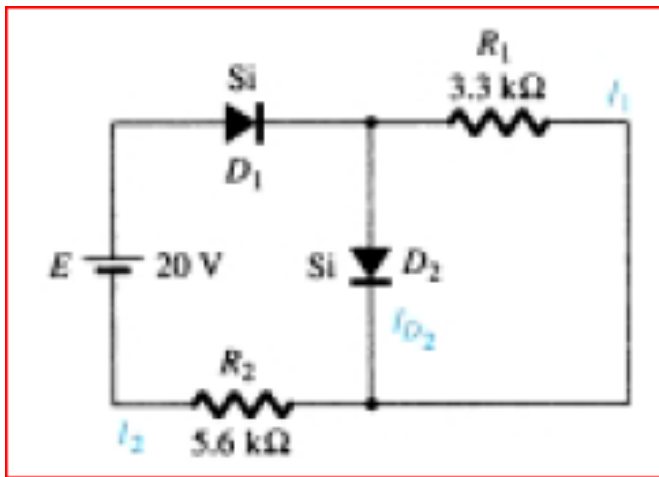


Q8. Design a Multirange ammeter using a PMMC instrument of $(I_{FSD} = 100 \mu A)$ and $(R_m = 50 \Omega)$ to have the ranges of : a) 500 mA b) 1 A c) 10A

Q9. Calculate the meter Resistance (R_x) on its range ($R_x 10k$) if $I_m = 10 \mu A$. Calculate the meter Resistance (R_x) on its range ($R_x 10k$) if $I_m = 10 \mu A$.

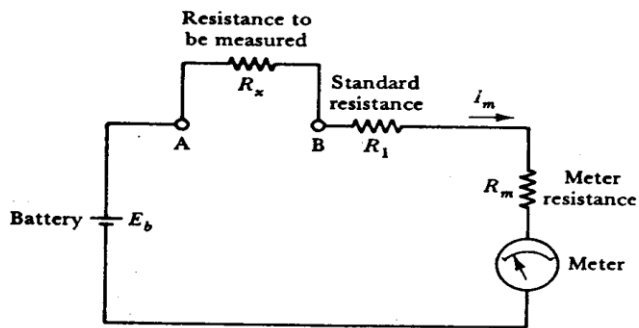


Q10. Determine the currents I_1 , I_2 , and I_{D2} for the network of Fig.

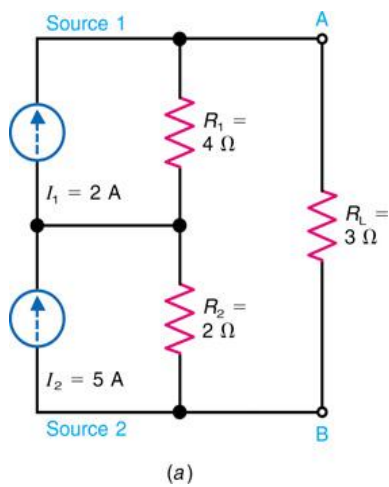


Q11. The series ohmmeter as shown in figure is made up of 1.5 V battery PMMC and a standard resistance $(R_1 + R_m) = 15 k\Omega$.

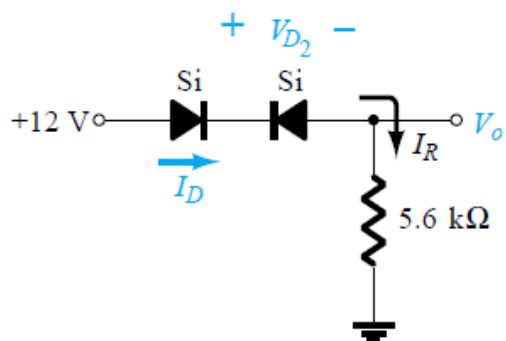
- 1- Determine the full scale deflection current (I_{FSD}).
- 2- Determine how the resistance scale should be marked at 0.25 FSD and 0.75 FSD
- 3- What should you do if the battery voltage falls to below 1.5 V ?



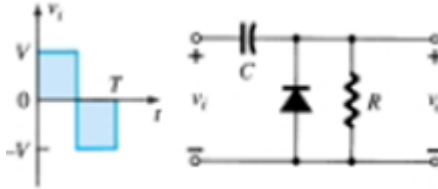
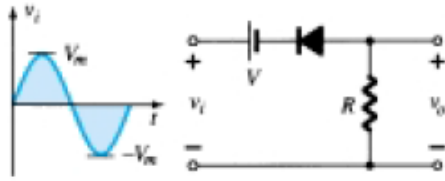
Q12. Find the Norton equivalent circuit for the network external to the resistor R_L from the following circuit.



Q13. Determine I_D , V_{D2} , and V_o for the circuit of Figure.



Q14. Write the output wave form for the following circuits.



Q15. A CRT has an anode voltage of 2000 V and 2 cm long and 5 mm apart parallel deflecting plates. The screen is 30 cm from the centre of the plates. Find the input voltage required to deflect the beam through 3 cm. The input voltage is applied to the deflecting plates through amplifiers having an overall gain of 100.