

Roll No.:.....

National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch: ECE

Semester :7th

Title of the Course: Electronic Instrumentation

Course Code: EC 401 Time: 2 Hours

Maximum Marks: 30

Note: All the questions are compulsory. Assume any data suitably if found missing.

- Q1. Calculate the meter current and indicated resistance for the ohmmeter circuit of Fig. 1 on its $R \times 100$ range when (a) $R_x = 0$ and (b) $R_x = 2.4 \text{ K}\Omega$ where R_x is unknown resistance. The applied DC voltage is 1.5 V. Here $R_m = 3.82 \text{ K}\Omega$. The full-scale deflection (FSD) current of the galvanometer is $37.5 \mu\text{A}$. [8]

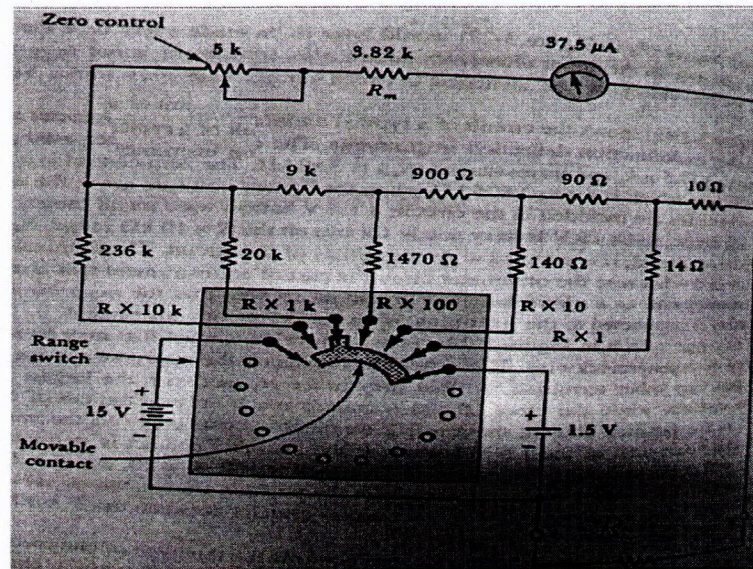


Fig.1

- Q2. Determine the meter reading for the circuit in Fig. 2 when $E = 5 \text{ V}$ and the meter is set to its 10V range. The FET gate-source voltage is -5 V , $V_p = +5 \text{ V}$, $R_m = 1 \text{ K}\Omega$, and $I_m = 100 \mu\text{A}$ at full scale. [6]

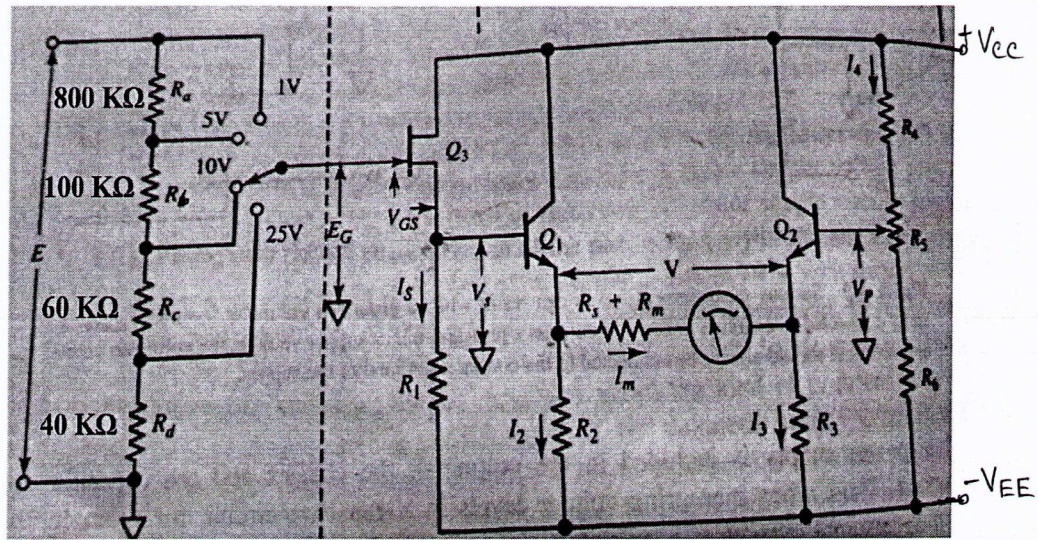


Fig.2

Q.3. A PMMC Instrument with $FSD=50\mu A$ and $R_m=1700\Omega$ is used in the half wave rectifier voltmeter circuit illustrated in Fig. 3. The silicon diode(D1) must have a minimum (peak) forward current of $100\mu A$ when the measured voltage is 20% of FSD. The voltmeter is to indicate 50V rms at full scale. Calculate the values of R_S and R_{SH} . [6]

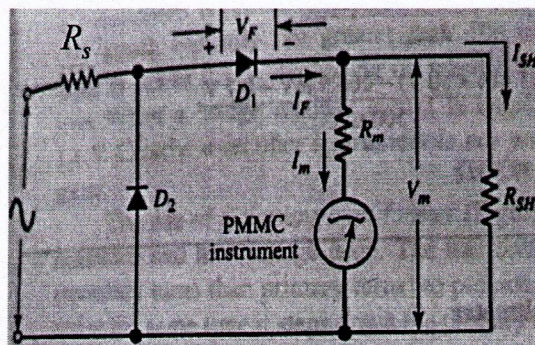


Fig.3

Q.4. Explain the working principle of single and dual slope digital voltmeters and compare their performances. [6]

Q.5 A dual slope A/D has $R=100\text{ k}\Omega$ and $C=0.01\text{ }\mu\text{F}$. The reference voltage is 10 volts and the fixed integration time is 10 ms. Find the conversion time for a 6.8V input. [4]