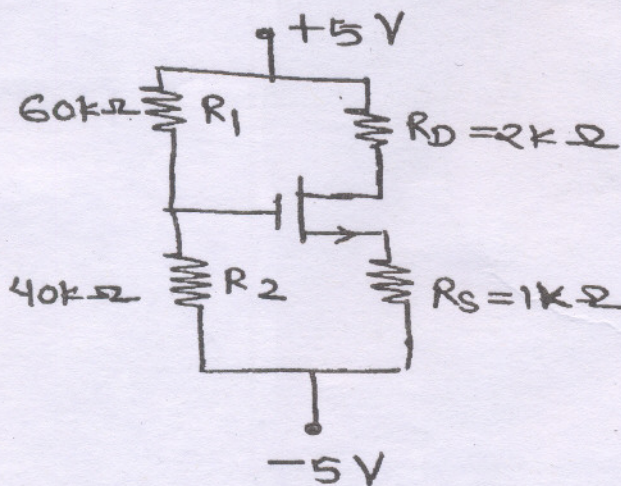


- (4) Assume **additional** data whenever **necessary**.
- As a switch JFET is preferred over BJT justify. 20
 - BC147 A transistor have very thin and lightly doped base region. Justify.
 - Compare EMOSFET and DMOSFET.
 - Compare output characteristics of a transistor in CB and CE mode.
 - Compare CE and CS amplifiers.
 - Design a single stage RC coupled CE amplifier to meet the following specifications : 15
 $V_{o_{peak}} = 3V$; $|A_v| \geq 120$; $S \leq 8$
 f_L better than 10 Hz. $R_i \geq 3k\Omega$.
 Choose a suitable transistor with proper justification from the data sheet. 5
 - Calculate the voltage gain and input impedance of the circuit designed in part (a) if bypass capacitor is disconnected:
 - Design a single stage RC coupled CS amplifier using JFET BFW-II to meet the following specifications:- 10
 $|A_v| \geq 5$
 $f_L \leq 15\text{ Hz}$
 $V_{o/pp} = 3V$
 $I_{DSQ} = \frac{I_{DSS}}{2}$
 - Redesign the above circuit for zero temperature drift. 10
 - Draw a neat circuit diagram with proper biasing of BJT CB amplifier, derive expressions for voltage gain, current gain, input impedance and output impedance. 15
 - Draw various biasing schemes used for BJTs. Compare them in terms of stability factor. 5
 - Draw a neat circuit diagram with proper biasing of JFET CG amplifier. Derive expressions for voltage gain, input impedance and output impedance. 15
 - With the help of neat diagrams explain working of power FET [V MOS] 5
 - Draw a neat circuit diagram for RC-coupled two stage CE – CE amplifier where for the 1st stage bypass capacitor is connected and for the 2nd stage bypass capacitor is disconnected. 15
 Derive expressions for overall voltage gain, current gain, input impedance and output impedance.
 - For the following circuit determine V_{GSQ} , I_{DSQ} and V_{DSQ} . 5



$$V_{TN} = 1V$$

$$K_n = 0.5 \text{ mA/V}^2$$

- Write short notes on any **four** :- 20
 - NMOS Amplifier with depletion load
 - LC filter
 - Schottky barrier diode
 - Comparison of CE, CB and CC amplifier
 - Diode clamping circuits. Working and waveforms.