Q)Find the output voltage of an ideal op-amp. If V_1 and V_2 are the two input voltages--> $V_O= A(V_1-V_2)$

Q)How will be the output voltage obtained for an ideal op-amp?--> **Amplifies the difference between the two input voltages**

Q)An ideal op-amp requires infinite bandwidth because--> **Signals can be amplified without attenuation**

Q)Ideal op-amp has infinite voltage gain because--> **To obtain finite output voltage**
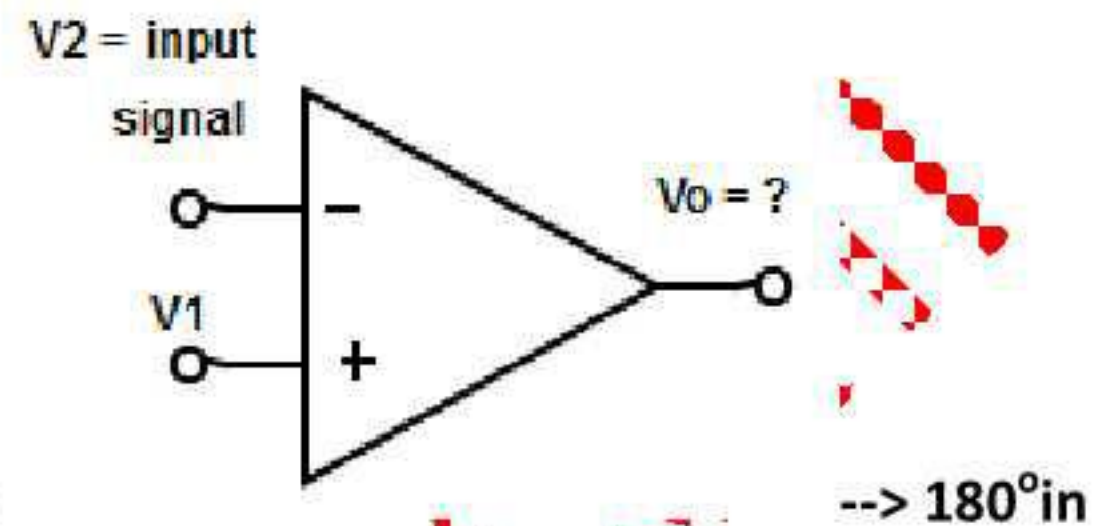
Q)Determine the output from the following circuit   --> **180°in phase with input signal**

Q)Which of the following electrical characteristics is not exhibited by an ideal op-amp?--> **Infinite output resistance**

Q)What is the purpose of differential amplifier stage in internal circuit of Op-amp?--> **Cancel common mode signal**

Q)Which of the following is not preferred for input stage of Op-amp?--> **Cascaded DC amplifier**

Q)What will be the emitter current in a differential amplifier, where both the transistor are biased and matched? (Assume current to be $I_E= I_Q/2$

Q)The purpose of level shifter in Op-amp internal circuit is to--> **Adjust DC voltage**

Q)How a symmetrical swing is obtained at the output of Op-amp--> **Providing amplifier with positive& negative supply voltages**

Q)Which factor determines the output voltage of an op-amp?--> **Both positive and negative saturation voltage**

Q)Which is not the internal circuit of operational amplifier?--> **Clamper**

Q)Change in value of common mode input signal in differential pair amplifier make--> **Change in voltage across collector**

Q)Find collector current I_{C2}, given input voltages are V_1=2.078v & V_2=2.06v and total current
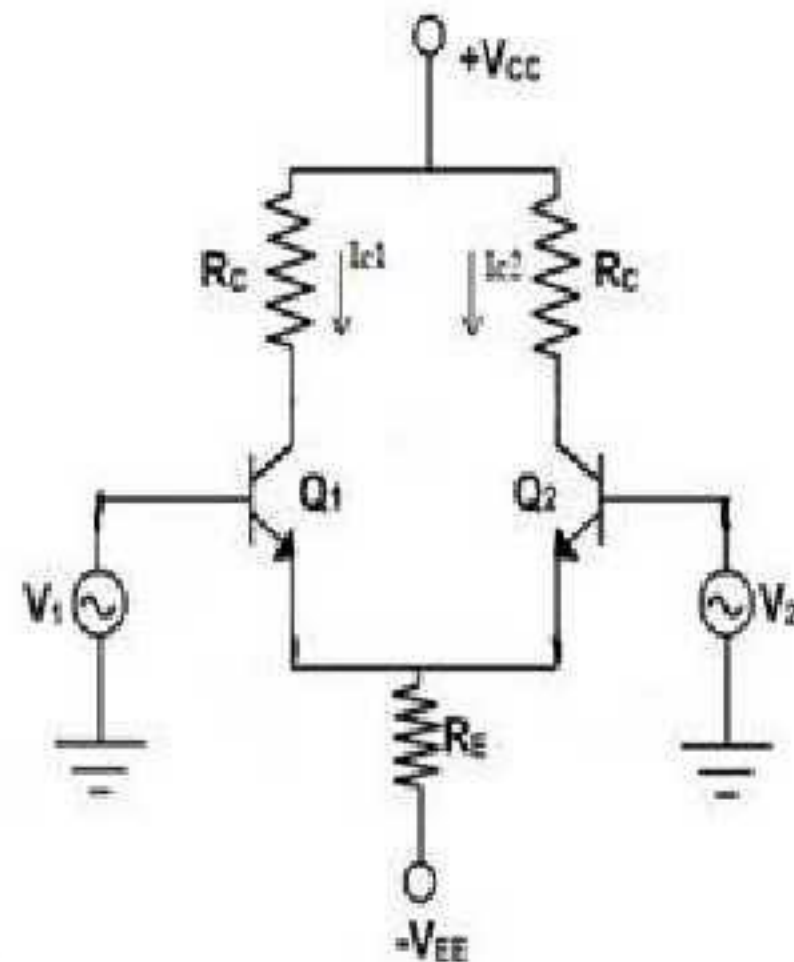
I_Q=2.4mA. (Assume α=1)   **--> 0.8Ma**

Q)At what condition differential amplifier function as a switch**--> $4V_T < V_d < -4V_T$**

Q)For $V_d > 4V_T$, the function of differential amplifier will be**--> Limiter**

Q)Define total current (I_Q) equation in differential amplifier with constant current bias current**--> $I_Q=1/R_3(VEER_2/R_1+R_2)$**

Q)Constant current source in differential amplifier is also called as**--> Current Mirror**

Q)When will be the mirror effect valid**--> β≫1**

Q)What is the purpose of diode in differential amplifier with constant current circuit?**--> Total current independent on temperature**

Q)If the value of Common Mode Rejection Ratio and Common Mode Gain are 40db and -0.12 respectively, then determine the value of differential mode gain**--> 4.8**

Q)To increase the value of CMRR, which circuit is used to replace the emitter resistance Re in differential amplifier?**--> Constant current bias**

Q)What will be the overall gain in Darlington circuit, if the individual transistor gain is 200?**--> 40000**

Q)To increase the input resistance in differential amplifier, replace the transistor by**--> Darlington pair**

Q)What is the drawback in using Darlington pair in differential amplifier?**--> High offset voltage**

Q)Determine the amount of shift happens in level shifter?**--> -0.7v**

Q)A widlar current source is used**--> to get low value of current**

Q)Determine the early voltage, if the output resistance is 2.52kΩ and input current is 2mA**--> 10v**

Q)In practical application of current mirror, early voltage is assumed to be**--> Infinite**

Q)The input voltage of a difference amplifier is 2.5v and 4.9v. If the transconductance is 0.065Ω[1], determine the load current entering the next stage**--> 0.156A**

Q)What is the need for level shifter in operational amplifier?**--> Limits the output voltage**

Q)Limitation of an output stage amplifier, if it emitter follower with complementary transistor**--> Cross-over distortion**
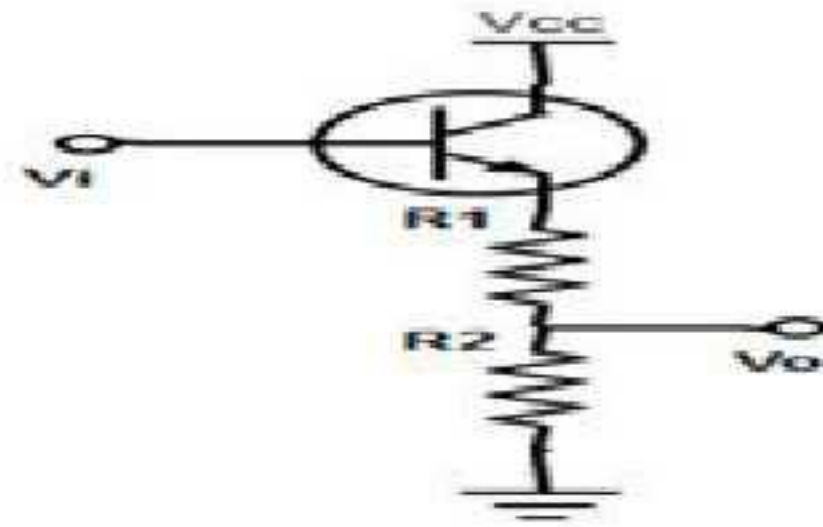
Q)Find the disadvantage in the following circuit diagram:

--> Voltage get attenuated by R_2

Q)Which circuit is used as active load for an amplifier**--> Current Mirror**

Q)What is the equation of load current for a differential amplifier with an active load?**--> $I_L = g_m v_d$**

Q)introducing FET differential amplifier pair at the input stage of differential amplifier produces**--> High input resistance**

Q)Why active load is used in amplifier to obtain large gain in intermediate stage of amplifier?**--> To obtain a very large voltage gain**

Q)Compute the output voltage if the input voltage is reduced to zero in differential amplifier with one op-amp?**--> Cannot be determined**

Q)Find the value of input resistance for differential amplifier with one op-amp. If $R_1 = R_2 = 100\Omega$ and $R_F = R_3 = 5k\Omega$.**--> $R_{IFx} = 100\Omega$; $R_{IFy} = 5.1k\Omega$**

Q)The bandwidth of the differential amplifier increases, if the value of**--> Closed loop voltage gain decreases**

Q)Where does the compensating network connected in an inverting amplifier.**--> Non-inverting input terminal**

Q)Why closed loop differential amplifiers are difficult to null?**--> Due to compensating network**

Q)What is the net output voltage for differential amplifier with one op-amp**--> $V_o = -(R_F/R_1)*(V_x-V_y)$**

Q)How the value of output offset voltage is reduced in closed loop op-amp?**--> By reducing gain**

Q)µA741 is a single op-amp and available as an**--> 8-pin DIP**

Q)how many IC technologies has been developed**--> 2**

Q)The output voltage of an open-loop differential amplifier is equal to**--> Product of voltage gain and the difference between the two input voltages**

Q)How does the open loop op-amp configuration classified?**--> Based on the input applied**

Q)What is the final stage in IC fabrication**--> metallization**

Q)Voltage follower is also called as**--> Non-inverting amplifier**

Q)An op-amp can be modeled as**--> voltage controlled voltage source**

Q)Compute R_{if} for an inverting amplifier with feedback, where the value of input resistance of op-amp is 4.7kΩ.**--> 4.7kΩ**

Q)LSI means**--> 300 to 3000 gates/chip**

Q)VLSI means**--> more than 3000gates/chip**

Q)SSI means**--> 3 to30gates/chip**

Q)MSI means**--> 30 to 300gates/chip**

Q)Ideal vale of Av of IC 741 is**--> ∞**

Q)Ideal vale of PIV of IC 741 is**--> 0**

Q)IC 741 available in--> **8-pin**
Q)The closed loop voltage gain is reciprocal of--> **Gain of the feedback circuit**
Q)Ideal vale of RI of IC 741 is--> **∞**
Q)Ideal vale of Ro of IC 741 is--> **0**
Q)Find the input and output voltage in voltage follower circuit?--> V_{in}=9v and V_{out}= 9v
Q)Ideal value of CMRR is--> **∞**
Q)Op-amp block diagram contains how many difference amplifiers--> **1**
Q)If the feedback voltage and the output voltage are given as 10v and 4v. Find the gain of the feedback circuit in voltage-series feedback amplifier?--> **2.5v**
Q)How is the difference voltage calculated in closed loop non-inverting amplifier?--> V_{id}= V_{in} V_f
Q)Inverting op-amp out put voltage is wrt to input--> **in phase**
Q)In non inverting terminal input out put voltages--> **180**
Q)In which configuration does the op-amp function as a high gain amplifier?--> **All of the mentioned**
Q)What is the purpose of differential amplifier stage in internal circuit of Op-amp?--> **Cancel common mode signal**
Q)Sine wave is converted in to squre wave which application of op-amp is--> **Schmitt trigger**
Q)How a symmetrical swing is obtained at the output of Op-amp--> **Providing amplifier with positive& negative voltage**
Q)The diffrance amplifier output voltage is--> **Vo-V1**
Q)The three in put summer out put voltage of IC 741 is--> **y0+v1+v1**
Q)Which is not the internal circuit of operational amplifier?--> **Clamper**
Q)The purpose of level shifter in Op-amp internal circuit is to--> **Adjust DC voltage**

$$V_o = - \left(\frac{R_f}{R_2} V_2 - \frac{R_f}{R_3} \frac{R_f}{R_1} V_1 \right)$$

Q)How many op-amps are required to implement this equation? -->
2
Q)How many op-amps are required to implement this

$$V_o = \frac{R_3}{R_1 + R_3} \frac{R_2 + R_4}{R_2} V_1 - \frac{R_4}{R_2} V_2$$

equation? --> **1**
Q)Full wave rectifier PIV voltage is--> **2Vm**
Q)In op-amp will act as a integrator which elements are present--> **resistor**
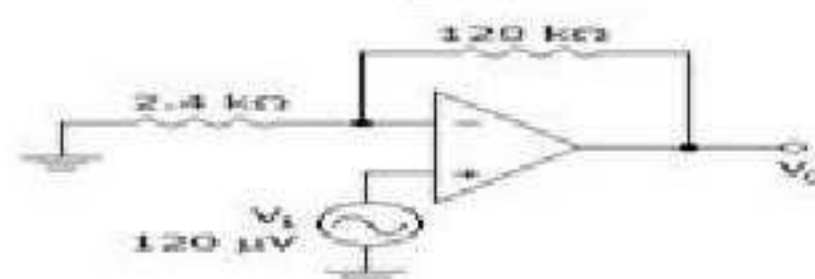Q)IC 741 op-amp is which type package--> **DIP**
Q)MSI means--> **30 to 300gates/chip**
Q)LSI means--> **300 to 3000 gates/chip**
Q)How many op-amps are required to implement this

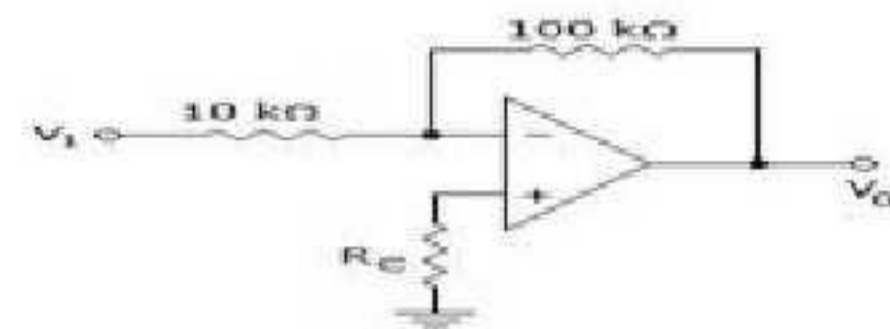$$V_o = \frac{R_3}{R_1 + R_3} \frac{R_2 + R_4}{R_2} V_1 - \frac{R_4}{R_2} V_2$$

equation? --> **1**

Q)Calculate the output voltage. --> **6.12mv**

Q)Calculate the input voltage for this circuit if V_o= 11 V.   -->
1.1v

Q)An example of an instrumentation circuit is a(n) _____.--> **All of the above**

Q)How many op-amps are required to implement this
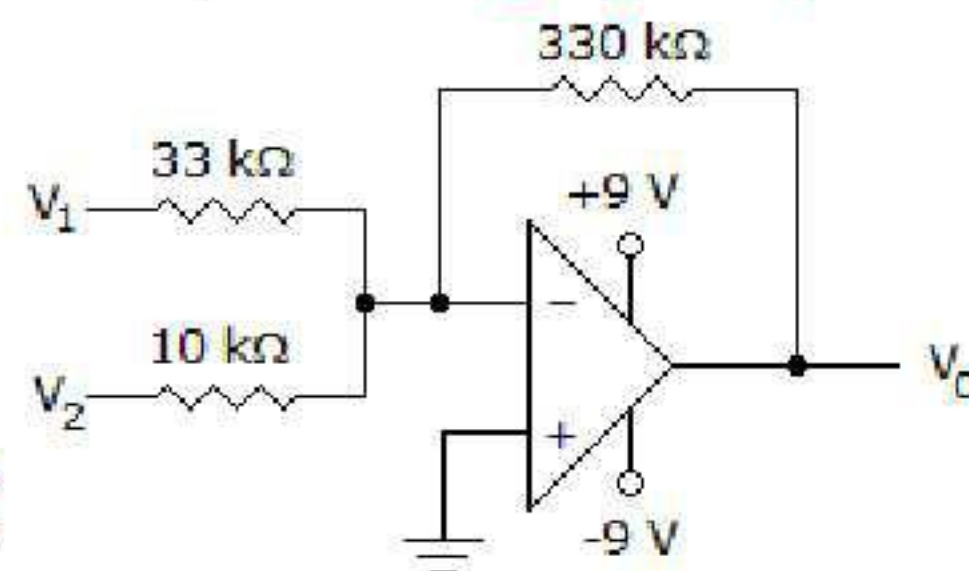
$$V_o = - \left(\frac{R_f}{R_1} V_1 + \frac{R_f}{R_2} V_2 + \frac{R_f}{R_3} V_3 \right)$$

equation?   **--> 1**

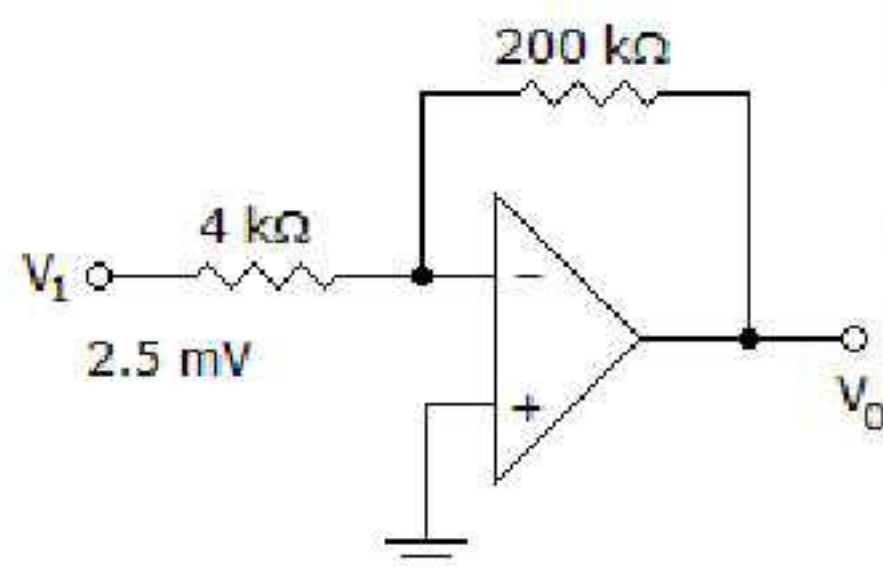Q)A comparator is an example of a(n)--> **nonlinear circuit**

Q)In an averaging amplifier, the input resistances are--> **greater than the feedback resistance**

Q)Calculate the output voltage if V_1= V_2= 0.15 V.   --> -
6.45V

Q)Determine the output voltage for this circuit with a sinusoidal input of 2.5
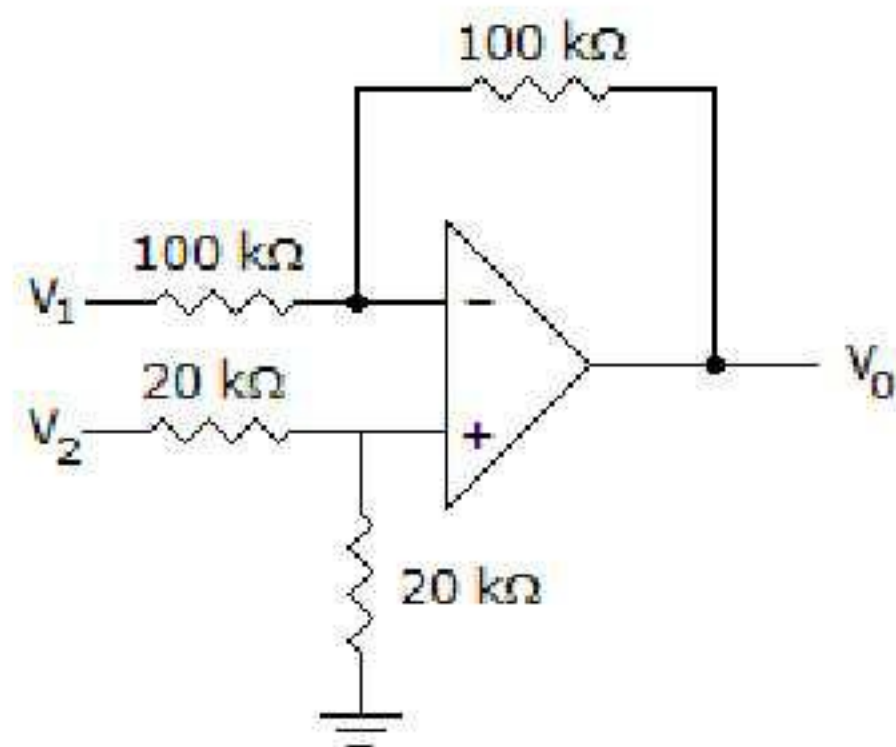

Mv   **--> -0.125V**

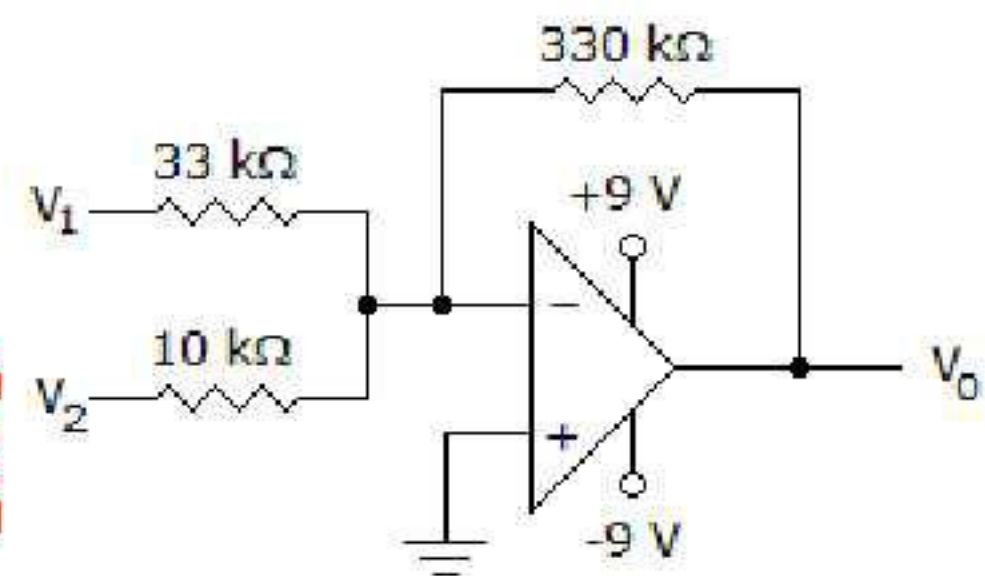Q)How many op-amps are required to implement this equation? V_o= V_1--> **1**

Q)Determine the output voltage when $V_1 = V_2 = 1$ V. **--> 0v**
Q)A digital-to-analog converter is an application of the**--> scaling adder**
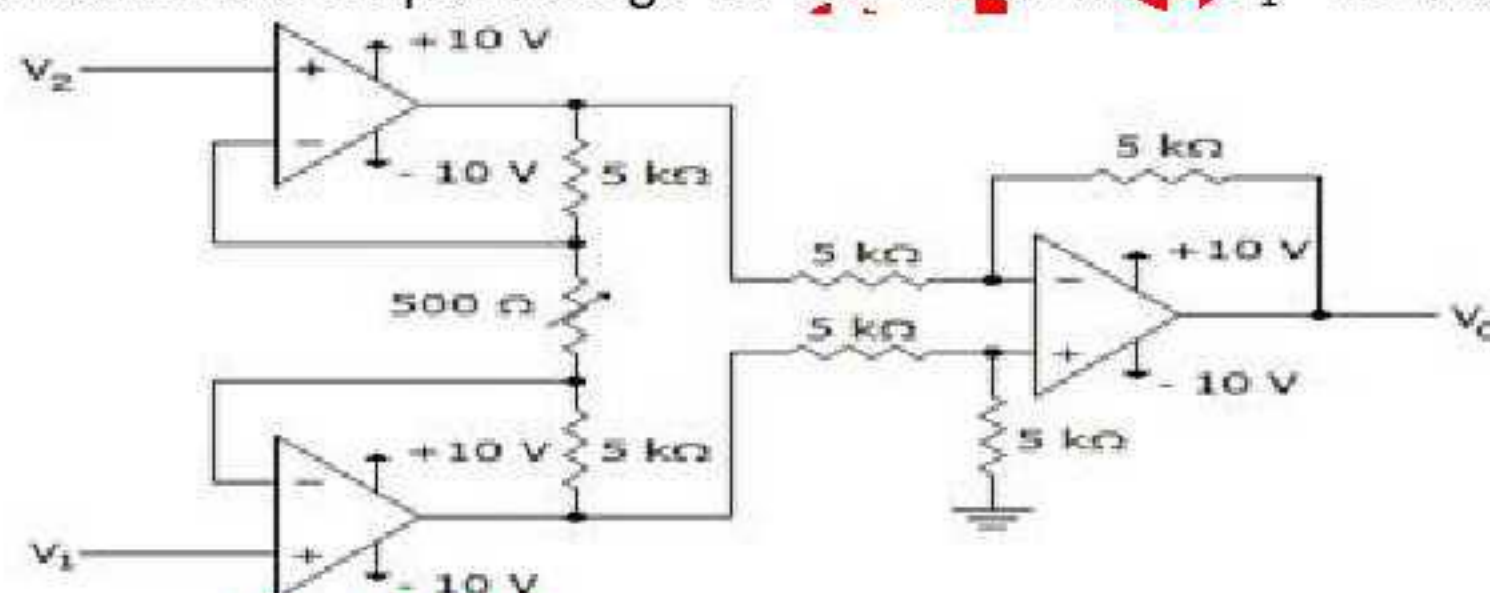

Q)Calculate the output voltage if $V_1 = 0.2$ V and $V_2 = 0$ V
--> 2v
Q)A basic series regulator has**--> both an error detector and a reference voltage**
Q)Calculate the output voltage for this circuit when $V_1 = 2.5$ V and $V_2 = 2.25$

V.   **--> 5.25V**
Q)The ramp voltage at the output of an op-amp integrator**--> increases or decreases at a linear rate**
Q)Circuits that shift the dc level of a signal are called**--> clampers**
Q)Why open-loop op-amp configurations are not used in linear applications?**--> Output switches between positive and negative saturation**
Q)What happen if any positive input signal is applied to open-loop configuration?**--> Output reaches saturation level**
Q)A zero-level detector is a**--> comparator with a trip point referenced to zero**
Q)For the feedback circuit of voltage series feedback amplifier, find the feedback voltage for the specifications: $R_1 = 1k\Omega$, $R_F = 10k\Omega$ and $V_o = 25v$**--> 2.3v**
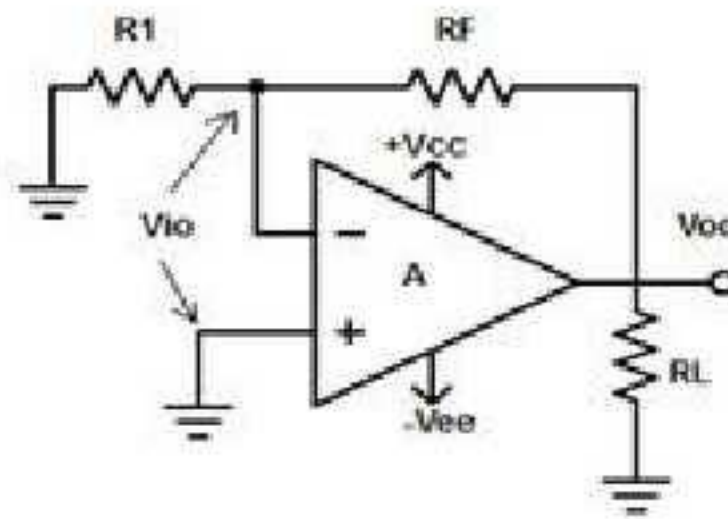
Q)What happens if $R_1 >> R_F$ in the circuit --> **Some amount of output offset voltage is present**

Q)Which factor determines the gain of the voltage series feedback amplifier?--> **Ratio of two resistors**

Q)If the feedback voltage and the output voltage are given as 10v and 4v. Find the gain of the feedback circuit in voltage-series feedback amplifier?--> **2.5v**

Q)How is the difference voltage calculated in closed loop non-inverting amplifier?--> $V_{id} = V_{in} V_f$

Q)Why the feedback circuit is said to be negative for voltage series feedback amplifier?--> **Feedback voltage is 180° out of phase with respect to input voltage.**

Q)What is the net output voltage for differential amplifier with one op-amp--> $V_o = -(R_F/R_1)*(V_x - V_y)$

Q)Determine the output resistance of differential amplifier with three op-amp. The op-amp used is 741c, with A=200000 and R_o. The output and difference of input voltages are 44 and 11.--> **1.5mΩ**

Q)The characteristics of non-inverting amplifier is identical to--> **Differential Amplifier with two op-amp**

Q)Why differential amplifiers are preferred for instrumentation and industrial applications?--> **Reject common mode voltage**

Q)Which of the following is a combination of inverting and non-inverting amplifier?--> **Differential amplifier with one op-amp**

Q)What will be the output voltage when V_x=0v?(Where V_x> inverting input terminal of differential amplifier with one op-amp)--> $V_o = (1+ R_F/ R_1)*V_1$

Q)The difference between the input and output voltage are -1v and 17v. Calculate the closed loop voltage gain of differential amplifier with one op-amp?--> **-17**

Q)The gain of differential amplifier with one op-amp is same as that of--> **The inverting amplifier**

Q)In which configuration does the op-amp function as a high gain amplifier?--> **All of the mentioned**

Q)When the non-inverting input terminal of an op-amp is equal to that of the inverting input terminal--> **All of the mentioned**

Q)The bandwidth of a non-inverting amplifier with feedback is equal to--> **c) $f_o(1+A$**

Q)When the input voltage is reduced to zero in a closed loop configuration the circuit acts as--> **Inverting and non-inverting amplifier**

Q)The closed loop voltage gain is reciprocal of--> **Gain of the feedback circuit**