*Lab. 6: The Bipolar Junction Transistor (BJT)DC Bias Stabilization*

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***Part 1 :- Simulate the following circuit and fill the table below (you have to add screen shot of your simulator result ): -***

**R1 = 120kΩ, R2 =120kΩ, R3 =6.8kΩ use BJT 2N2222 , consider β=75**



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VB /V | VE /V | VC  /V | IE | IC | IB |  |
|  |  |  |  |  |  | Simulation result  |
|  |  |  |  |  |  | Calculation |

Measure:-

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VBE/V | VBC/V | VCE/V | VR1 | VR2 |
|  |  |  |  |  |

The transistor work :-

1. In active region
2. At saturation point
3. At cut-off point

Why ???

***Part 2:-***

1. ***Change*** *R1 from 120k to 10k then measure*

|  |  |  |
| --- | --- | --- |
| ***VB*** | ***VC*** | ***VE*** |
|  |  |  |

The transistor work :-

1. In active region
2. At saturation point
3. At cut-off point

Why ???

1. ***Change*** *R2 from 120k to 3.3k then measure*

|  |  |  |
| --- | --- | --- |
| ***VB*** | ***VC*** | ***VE*** |
|  |  |  |

The transistor work :-

1. In active region
2. At saturation point
3. At cut-off point

Why ???

*Part 3:*

Temperature effect on bias stability and stability factor %ΔIc.(to be discussed in online session)

Typical transistor parameters affected strongly by temperature are turn on voltage (Vbe-on for bipolar=), turn-off leakage current, current gain.

For bipolar transistors with increasing temperature:

1. Vbe decreases
2. Current gain ẞ increases