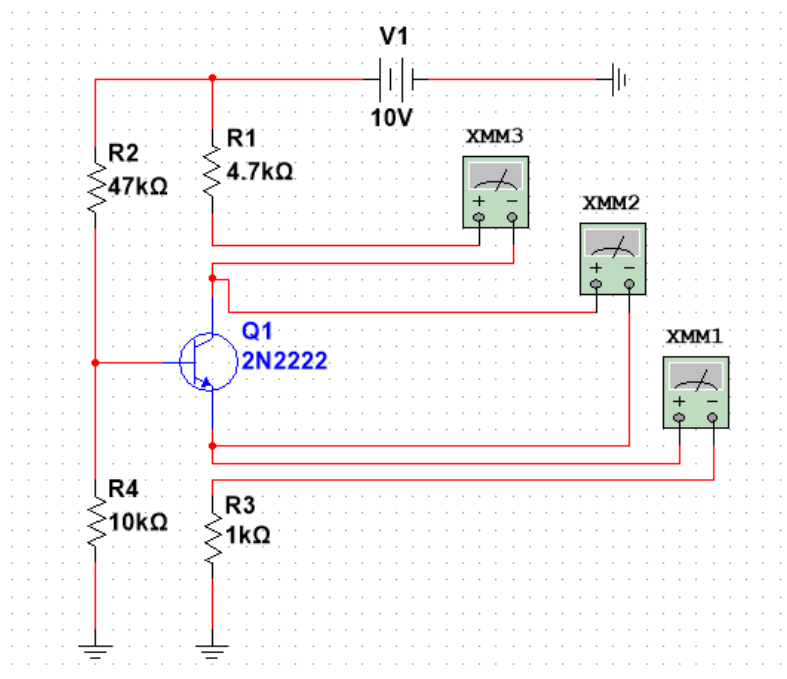


## Experiment 4

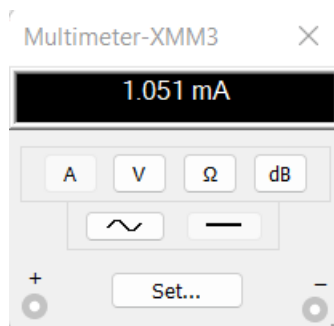
**Name:** Ahmed Samir said ahmed

**Id:** 20010107

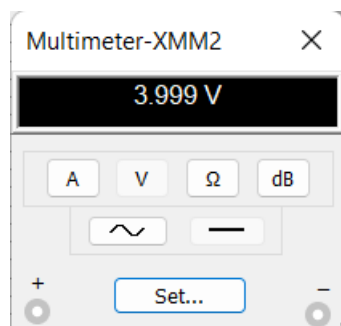
**First simulation ( Fig.1):-**



**Ic value:**



**Vc value:-**



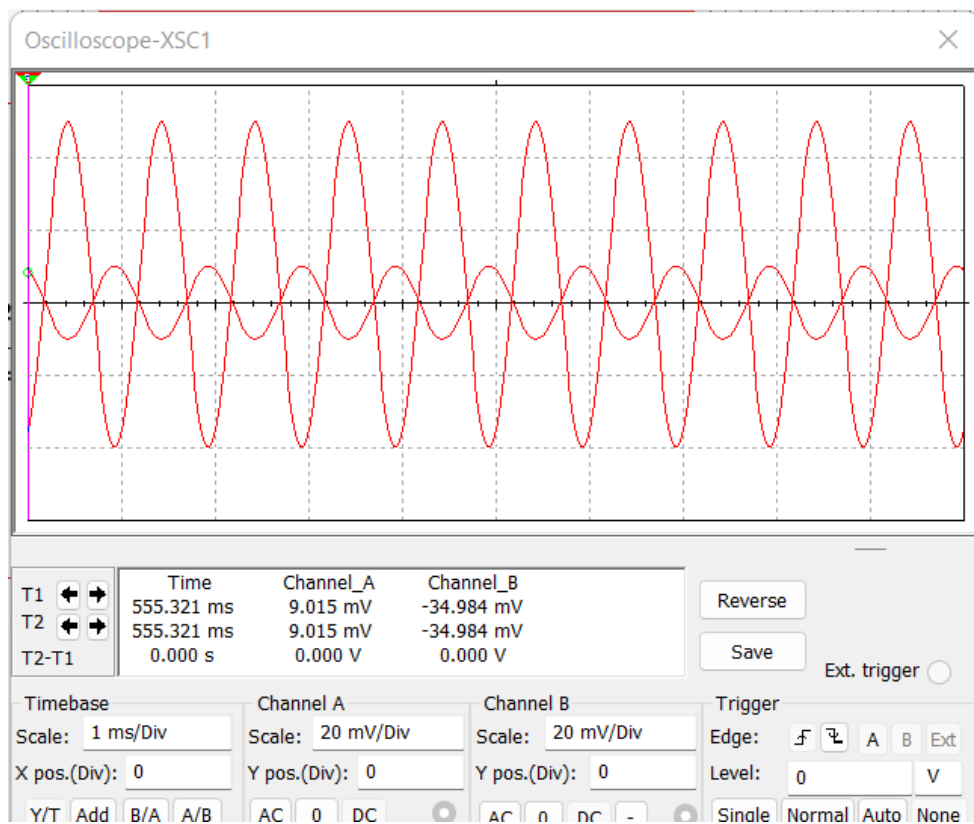
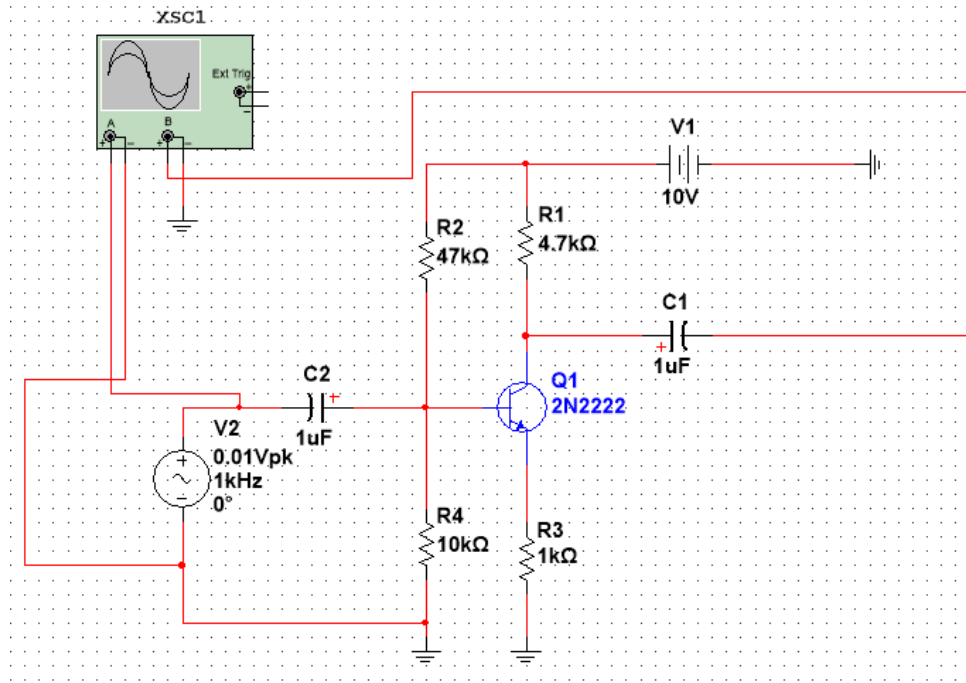
**Ie value:-**



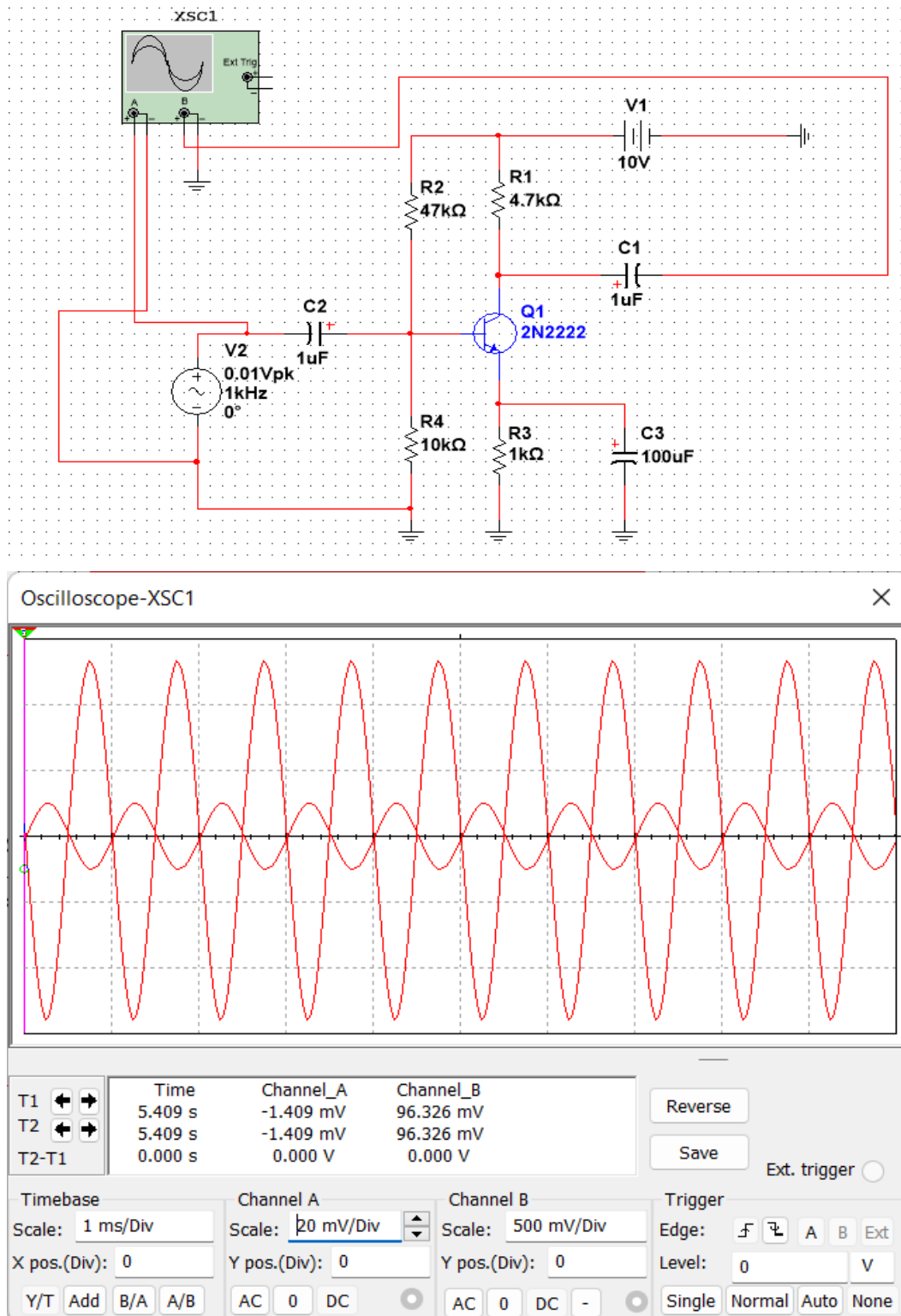
so, the DC operating point of the transistor is (3.99 v, 1.059mA)

## Second simulation (Fig.2):-

Before the 100uF capacitor



After the 100uF capacitor



As shown the gain increased after connecting the capacitor.

## Experiment questions

### 1. How to Identify NPN and PNP Transistor using multi-meter?

- **Step 1: (Base to Emitter test)** Hook the positive lead from the multimeter to the BASE (B) of the transistor. Hook the negative meter led to the EMITTER (E) of the transistor. For a good NPN transistor, the meter should show a voltage drop between 0.45V and 0.9V. If you are testing the PNP transistor, you should see "OL" (Over Limit). **Step 2: (Base to Collector test)** Keep the positive lead on the BASE (B) and place the negative lead on the COLLECTOR (C). For a good NPN transistor, the meter should show a voltage drop between 0.45V and 0.9V. If you are testing the PNP transistor, you should see "OL" (Over Limit). **Step 3: (Emitter to Base test)** Hook the positive lead from the multimeter to the EMITTER (E) of the transistor. Hook the negative meter led to the BASE (B) of the transistor. For a good NPN transistor, you should see "OL" (Over Limit). If you are testing the PNP transistor, the meter should show a voltage drop between 0.45V and 0.9V. **Step 4: (Collector to Base test)** Hook the positive lead from the multimeter to the COLLECTOR (C) of the transistor. Hook the negative meter led to the BASE (B) of the transistor. For a good NPN transistor, you should see "OL" (Over Limit). If you are testing the PNP transistor, the meter should show a voltage drop between 0.45V and 0.9V. **Step 5: (Collector to Emitter)** Hook the positive meter led to the COLLECTOR (C) and the negative meter led to the EMITTER (E) – A good NPN or PNP transistor will read "OL"/Over Limit on the meter. Swap the leads (Positive to Emitter and Negative to Collector) – Once again, a good NPN or PNP transistor should read "OL".

### 2. What is the meaning of the word transistor?

- A transistor is a semiconductor device used to amplify or switch electrical signals and power. The transistor is one of the basic building blocks of modern electronics. It is composed of semiconductor material, usually with at least three terminals for connection to an electronic circuit. A voltage or current applied to one pair of the transistor's terminals controls the current through another pair of terminals. Because the controlled (output) power can be higher than the controlling (input) power, a transistor can amplify a signal. Some transistors are packaged individually, but many more are found embedded in integrated circuits.