

# **EN1014 Electronic Engineering**



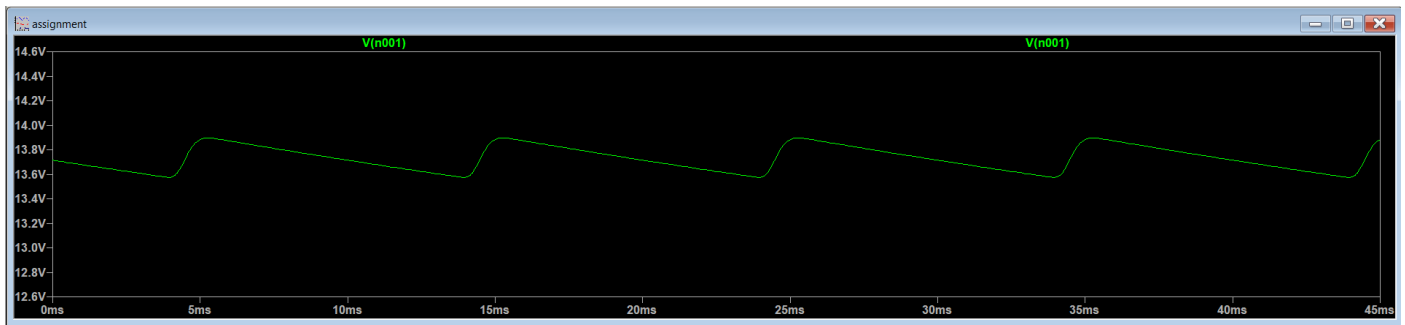
## **Assignment**

# **Audio Preamplifier with DC Power Supply**

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**220735E**

## Question 01



Peak to peak ripple voltage= 0.3234 V

## Question 02

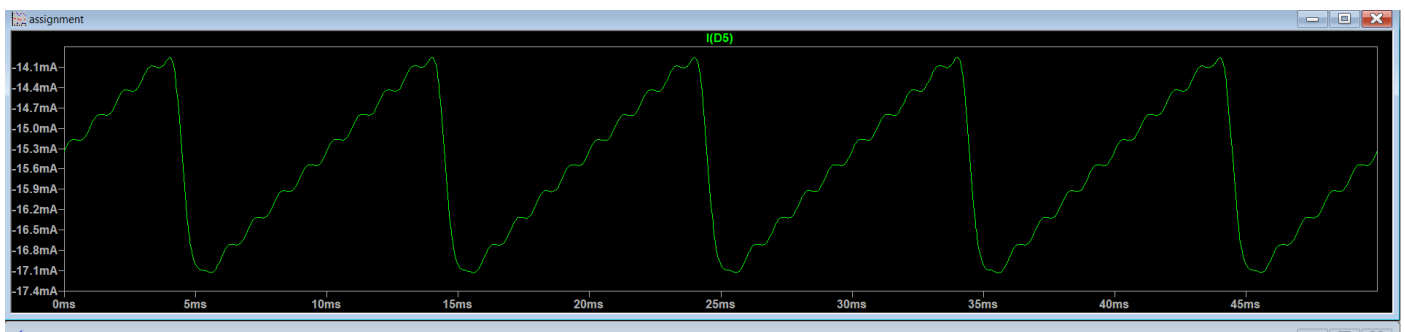
$$V_{DC} = 13.8974 - 0.3234/2 = 13.7357 \text{ V}$$

$$\text{Ripple Factor} = 0.3234 / (13.7357 * 2 * 1.7) = 0.0067967$$

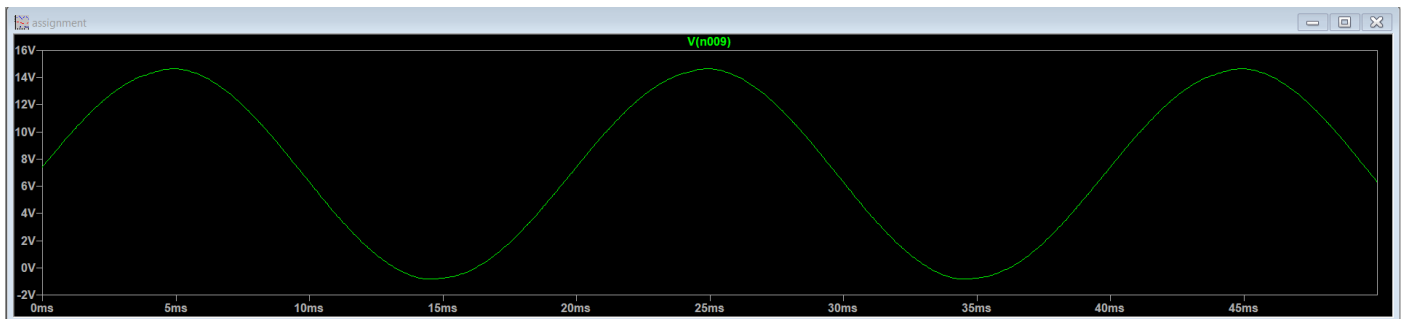
## Question 03

Minimum Zener current= 13.960371mA

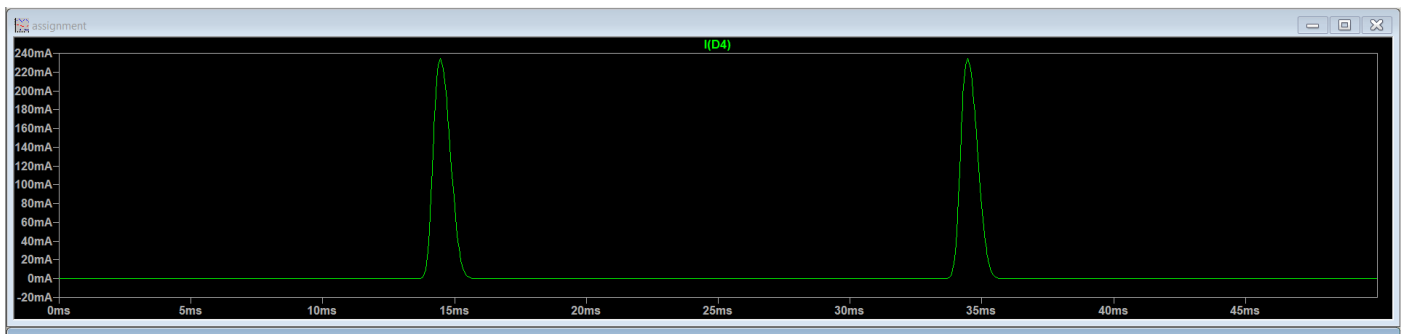
Maximum Zener current= 17.127029 mA



## Question 04

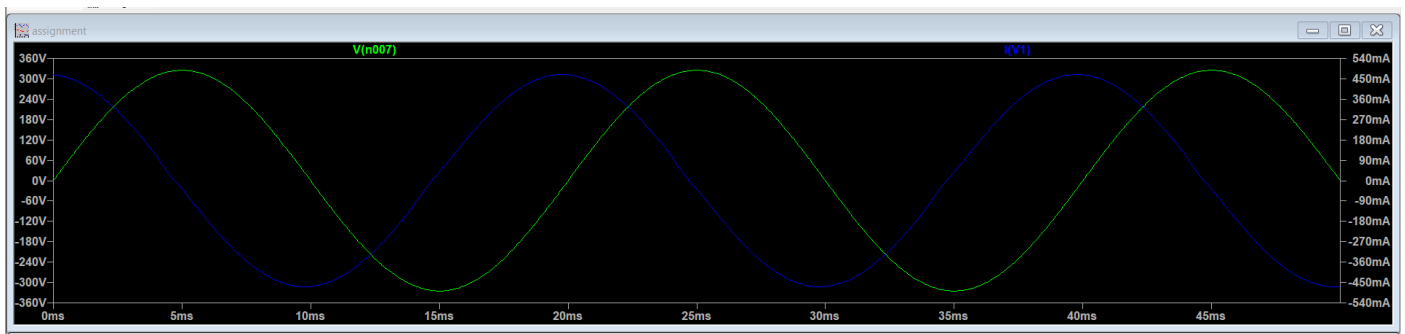


Peak inverse voltage=14.66 V



Peak current across a diode=234.88 mA

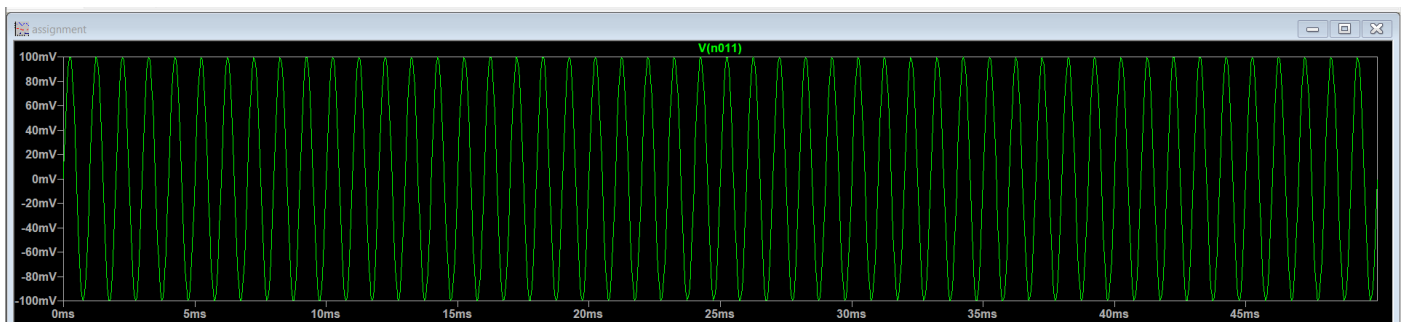
### Question 05



$$P_{\text{supply}} = V_{\text{rms}} I_{\text{rms}} = 325 \times 0.4692 / 2 = 76.245 \text{ W}$$

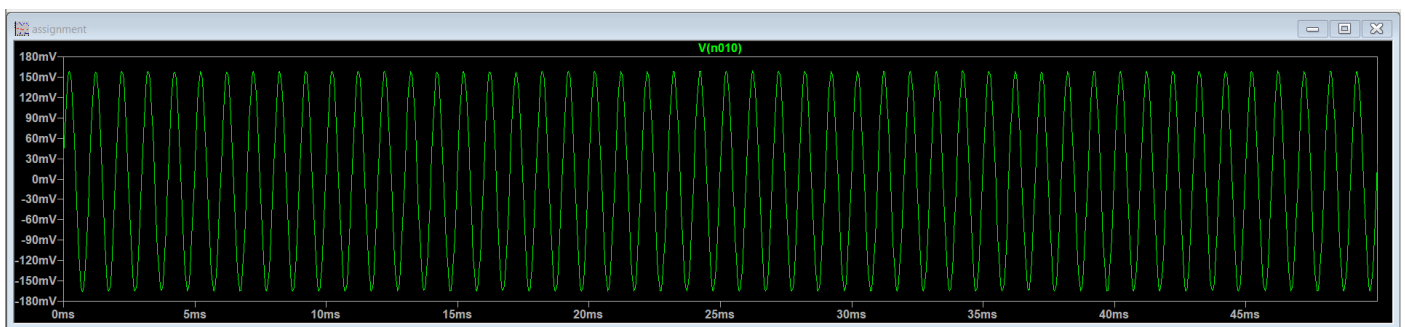
### Question 06

Input voltage Variation



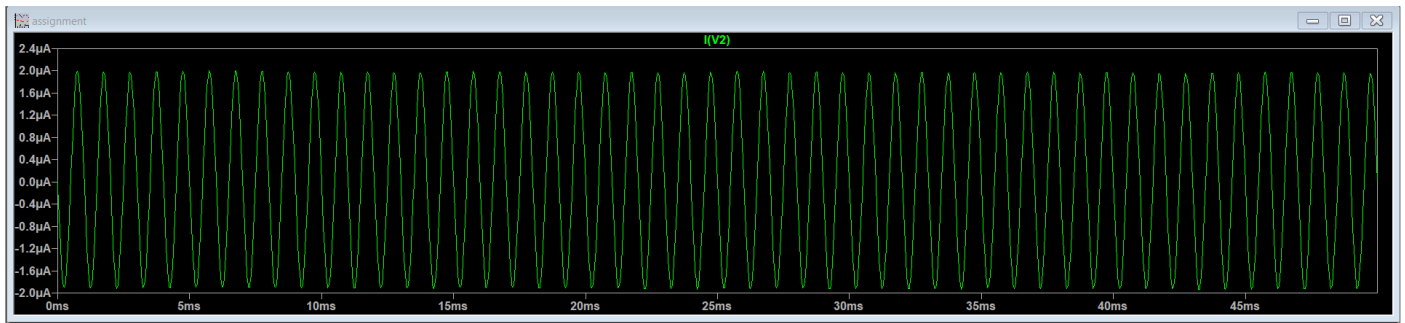
$$V_{pp} = 199.79 \text{ mV}$$

Output Voltage Variation



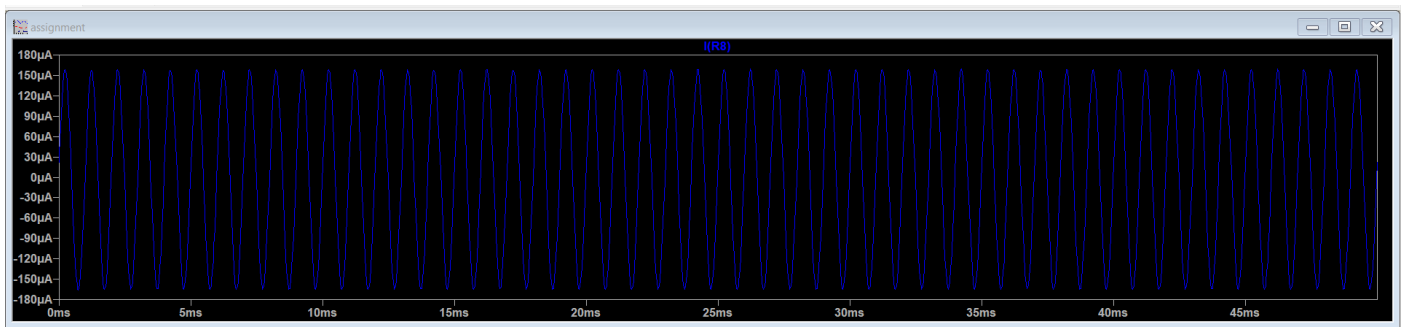
$$V_{pp} = 323.58 \text{ mV}$$

## Input Current Variation



$$I_{pp} = 3.9073 \text{ uA}$$

## Output Current Variation



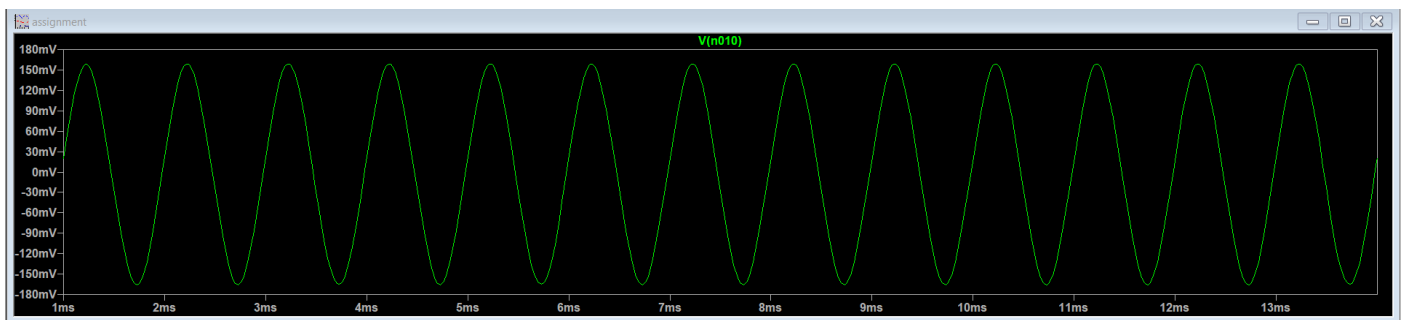
$$I_{pp} = 324.1 \text{ uA}$$

$$\text{Current Gain} = 324.1 / 3.9073 = 82.947$$

$$\text{Voltage Gain} = 323.58 / 199.79 = 1.6196$$

$$\text{Power Gain} = 134.34$$

## Question 07



There is no waveform distortion visible at the output.

If there is a distortion, noise interference and operational amplifier saturation may be the reasons for distortion. By changing the input impedance and adding capacitors to filter the noise, this can be reduced.

## Question 8

C2's function is to stop unwanted DC currents from getting into the amplifier circuit. It helps to improve the stability of the amplifier configuration. Therefore, it takes on the function of a coupling capacitor.