



Name:

Date:

- 3) What will happen to the volume of this frequency? (6 pts)
  
  
  
  
  
  
  
  
  
  
- 4) What will be the lowest frequency to cancel completely because of a 180-degree phase offset? (6 pts)
  
  
  
  
  
  
  
  
  
  
- 5) Bonus: Name 2 ways of restoring a flatter frequency response to this speaker system. (2 pts)

## II. Psychoacoustics:

### Questions:

- 1) Does the human ear respond equally to all frequencies of sound, or is it more sensitive to some frequencies than others? How does the relative response to change as the overall volume is increased? For full points, a graphical representation of the ear's response is encouraged. (5 pts)
  
  
  
  
  
  
  
  
  
  
- 2) Explain what acoustic reflex is, and when it is likely to occur. (5pts)
  
  
  
  
  
  
  
  
  
  
- 3) We are able to perceive the difference between a piano playing middle C, and a trumpet playing the same note. What are some of the characteristics that allow us to identify these differences? Again, a graphical representation of these differences may be useful. (5 pts)

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- 4) Two speakers are spaced as shown in the following illustration. Identical music signals are sent to both speakers at identical levels. A delay is applied to the left speaker, starting at 0 ms, and gradually increasing to 100 ms (3 pts). What will the listener perceive? (5 pts)



**Gradually increasing delay**



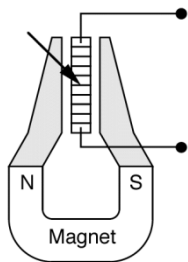
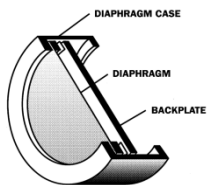
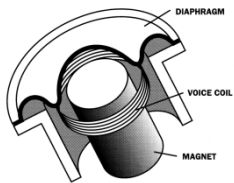
**Listener**

Name:

Date:

### III. Microphones:

- 1) Identify the following 3 microphone types, then state at least one pro, one con, and one suitable application for each type (10 pts)



- 2) Briefly discuss some considerations when choosing between a large and small diaphragm microphone. (5 points)

- 3) Briefly discuss some considerations when choosing between an omnidirectional microphone and a unidirectional microphone. (5 pts)

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#### **IV. Mixing and signal flow basics:**

- 1) Illustrate the flow of an audio signal from a dynamic microphone through an analog mixing console with internal EQ, but outboard compression and reverb. You will need an insert (post EQ), an aux send, and an aux return to accomplish this. (15 pts)

- 2) When would you want an aux send to be set to pre-fade vs. post-fade? (5 pts)

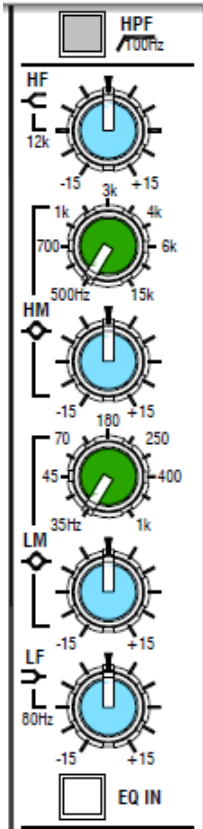


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## VI. EQ filters:

- 1) The following image shows the input EQ section of a typical analog mixing console. Label the function of each control shown here: (10 pts)



- 2) A common rule-of-thumb for EQ filters is to “boost wide, cut narrow”. Explain the meaning of this statement, comment on its validity, and try to think of one exception. (5 points)

- 3) Is it generally preferable to boost, cut, or avoid EQ as much as practical? Explain your reasoning. (5 pts)

