

BSc Audiology**AUDL4007 – Auditory Perception
(Year 4)****Examination 2009****Duration of Examination: 2 Hours****Answer Booklets**

All answers **must** be written in the Answer Booklets provided.

Candidates requiring additional answer booklets should contact an invigilator.

Any answers written on the Examination Paper will **not** be marked.

Do **NOT** write your name on your answer booklet(s), only your assessment number.

Answer FIVE of the following SIX questions.

Each question will carry equal weight towards your grade.

You are encouraged to use simple diagrams to illustrate your answers when appropriate.

Marks will also be awarded for the coherence and structure of your explanations.

- 1 Describe a simple yes/no detection experiment from the point of view of signal detection theory.

Ensure that you mention and define the following concepts (with appropriate graphs) in your discussion: hit, false alarm, miss, correct rejection, d' , bias, criterion, ROC curve.

What simple audiometric procedure do these concepts relate to most clearly?

- 2 Summarise the role of outer hair cells in normal auditory functioning.

Discuss the three main ways in which outer hair cell damage is reflected in human psychoacoustic measurements.

What changes in physiological functioning are supposed to underlie these changes? How do hearing aids attempt to ameliorate each of these deficits?

CONTINUE

- 3** Psychophysical (or psychoacoustic) tuning curves (PTCs) can be a useful way to determine the existence of 'dead regions' in the cochlea. Describe how you would measure a psychophysical tuning curve and what it is meant to measure. Sketch a PTC that you would expect to find in normal hearing. How would a psychophysical tuning curve from a 'dead region' be different from one obtained in a frequency region that was impaired, but not 'dead'? Make representative sketches of what you would expect to find.
- 4** A commonly used measure of temporal resolution is the temporal modulation transfer function. Describe what you would need to do to measure these in a listener using white noise (including the form of the stimuli), and the typical results obtained. Why is white noise the best signal to use in such studies? Explain the temporal window model and how it can be used to account for the results obtained.
- 5** What interaural differences do we use to localize sounds? How do these interaural differences arise? Name 3 or 4 instances where interaural differences are insufficient for localisation. What other cues can be used when interaural differences are not available?
- 6** Sketch the auditory area of a normal human listener and define the notions of MAF, MAP, threshold, uncomfortable loudness level and dynamic range. Describe the phon scale and sketch a few equal-loudness contours on your graph. Explain the notion of Weber's Law, and evaluate its accuracy for the discrimination of intensity. Explain, giving at least 2 examples, why the loudness of a sound is not simply proportional to its intensity.

END OF PAPER