

# THE HEARING AID COUNCIL

WRITTEN EXAMINATION 2007 (2)

PAPER 1  
3 hours - 6 Questions

Wednesday 3 October 2007

2.30pm – 5.30 pm

**Please read these instructions carefully. If you do not follow them your paper may be invalid.**

1. You should attempt **six** questions. Please read very carefully and follow the instructions on which questions you should answer.

Each question carries 20 marks in total.  
To help you time your answers, the marks for each part of the question are shown in brackets to the right hand side.

2. Your examination number (as notified) **and** question number **and** letter **must** be entered in the space provided at the top of **every sheet** of paper on which you answer your questions.
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6. You may use the reverse of your paper to continue the answer to a question.
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# THE HEARING AID COUNCIL EXAMINATION PAPER 1 – October 2007

## SECTION A

Answer THREE of the following four questions:

### 1A1

Explain the difference between the following:

- (i) Outer haircells and inner haircells. (4)
- (ii) Acute otitis media and chronic otitis media. (4)
- (iii) Cholesteatoma and Schwannoma. (4)
- (iv) Vertigo and dizziness. (4)
- (v) Sensory and neural hearing loss. (4)

### 1A2

- (i) Explain what is meant by the “lever ratio” with respect to the ossicles. (4)
- (ii) What are the effects of firstly an ossicular discontinuity and secondly an ossicular fixation on the following:
  - (a) The tympanogram. (4)
  - (b) Ipsilateral and contralateral stapedial reflexes. (4)
  - (c) The pure tone audiogram. (4)
- (iii) Name TWO causes of ossicular discontinuity and TWO causes of ossicular fixation. (4)

### 1A3

- (i) What is the difference between localisation and lateralisation? (4)
- (ii) What acoustic cues are used to localise: (4)
  - (a) Low frequency sounds.
  - (b) High frequency sounds.
- (iii) Explain the head shadow effect in relation to sounds of both high and low frequency. (4)
- (iv) What is the role of the pinna in localising sounds? (4)
- (v) What advice should be given to a client with unilateral hearing loss who is experiencing localisation problems? (4)

**1A4**

- (i) Define tinnitus and explain the difference between subjective and objective tinnitus. (4)
- (ii) List 4 causes of tinnitus. (4)
- (iii) Explain how the severity of tinnitus may be assessed. (4)
- (iv) What advice can a dispenser offer a client with tinnitus? (4)
- (v) Briefly explain what treatment options are available for tinnitus (4)

**SECTION B**

Answer **THREE** of the following four questions:

**1B1**

Answer all of the following:

- (i) Define dB in terms of Sound Pressure. (2)
- (ii) What is the period of a 1kHz tone? (2)
- (iii) How many octaves are there in the range 500Hz to 16kHz? (2)
- (iv) How are frequency and wavelength related? (2)
- (v) What is the inverse square law? (2)
- (vi) What is the difference between intensity and loudness? (2)
- (vii) Define gain of an amplifier. (2)
- (viii) Given a gain of 100 times, what is this in dB? (2)
- (ix) What is the fundamental frequency of a complex periodic waveform with frequencies of 120Hz, 240Hz, 480Hz? (2)
- (x) What is the fundamental frequency of a complex periodic waveform with periods of 1ms, 3ms and 9ms? (2)

**1B2**

Explain the differences between the following:

- (i) Standing wave and travelling wave. (4)
- (ii) Transverse and longitudinal wave. (4)
- (iii) Diffraction and distortion of sounds. (4)
- (iv) Recruitment of loudness and dynamic range. (4)
- (v) Peripheral and central masking. (4)

**1B3**

Answer ALL of the following:

- (i) Overmasking is the greatest problem in which type of hearing loss? (4)
- (ii) Not-masked results of a patient with one normal hearing ear and one with total sensori-neural hearing loss show the worse ear to have what degree of loss? (4)
- (iii) During audiometry, inter-aural attenuation may be increased by using what? (4)
- (iv) What is the third rule of masking? (4)
- (v) What tests can indicate the presence of loudness recruitment? (4)

**1B4**

Explain how the following conditions could be handled by the hearing aid audiologist and the implications for hearing systems fitting.

- (i) Fluctuating low frequency hearing loss. (4)
- (ii) Unilateral tinnitus and high frequency loss. (4)
- (iii) Acoustic trauma induced hearing loss. (4)
- (iv) Asymmetrical bilateral high frequency loss with unsteadiness and veering to one side on walking. (4)
- (v) Mixed conductive and sensory hearing loss bilaterally. (4)

# THE HEARING AID COUNCIL

WRITTEN EXAMINATION 2007 (2)

PAPER 2  
3 hours - 6 Questions

Wednesday 3 October 2007

10.00 am – 1.00 pm

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**THE HEARING AID COUNCIL  
EXAMINATION PAPER 2 – October 2007**

**SECTION A**

**Answer THREE of the following four questions:**

**2A1**

Explain the following:

- (i) Peak clipping. (4)
- (ii) Output limiting compression. (4)
- (iii) Wide dynamic range compression. (4)
- (iv) Syllabic compression. (4)
- (v) Discuss the difference between Fixed Frequency Response (FFR) and Level Dependent Frequency Response (LDFR) in compression systems. (4)

**2A2**

Answer ALL of the following:

- (i) What are the psycho-social consequences of acquiring a hearing loss? (6)
- (ii) What personal factors affect an individual's rehabilitation process? (6)
- (iii) What effect do these personal factors have on the choice of hearing instruments? (8)

**2A3**

Explain FIVE features of a digital hearing aid system and the ways in which these features could benefit the client. (4 marks each)

**2A4**

Explain the effects of each of the following on hearing aid systems:

- (i) Vents. (4)
- (ii) Tubing dimensions. (4)
- (iii) Horn effects. (4)
- (iv) Filters in tubing. (4)
- (v) Meatal depth of mould. (4)

## SECTION B

### All candidates must answer question 2B1 and 2 out of the other 3 questions

#### 2B1

- (i) List TEN conditions for which a client must be referred to Registered Medical Practitioner. (5)
- (ii) What equipment must a registered hearing aid dispenser have with them at every consultation? (5)
- (iii) When must audiometry be carried out by a registered hearing aid dispenser? (5)
- (iv) List the requirements for a visit to a potential client by a registered hearing aid dispenser. (5)

#### 2B2

A client attends for their clause 11 review complaining that certain sounds are too loud including their own voice. The client's loss is sensori-neural and Right = Left, the AC readings for both ears are as follows:

<b>kHz</b>	0.25	0.5	1	2	4	8
<b>dBHL</b>	30	30	35	50	65	70

The client has been fitted with bilateral single-channel digital half shell instruments without gain/volume control and both have large vents.

- (i) Discuss the possible reasons for this complaint. (5)
- (ii) Explain the steps you would take to resolve this situation. (11)
- (iii) Explain the counselling you would give this client. (4)

#### 2B3

A client with a bilateral loss (analogue user right ear) requests a hearing test. They would like advice on replacing the existing aid with a digital instrument. The client has worn the analogue instrument consistently for many years. The main complaint has always been noise in groups and the client has read that a digital instrument will solve this problem.

- (i) Explain the procedure you would take. (8)
- (ii) What advice would you give this client? (8)
- (iii) What counselling would this client receive? (4)

**2B4**

Provide answers to the following questions from a prospective client for a hearing aid.

- (i) What is a hearing aid? (4)
- (ii) Which hearing aid is best for me? (4)
- (iii) Will I be able to hear my friend in the pub where there is background noise? (4)
- (iv) How long will it take for me to adjust to the hearing aid? (4)
- (v) Why do I need two aids? (4)

# THE HEARING AID COUNCIL

WRITTEN EXAMINATION 2007 (2)

PAPER 3  
3 hours - 6 Questions

Wednesday 3 October 2007

10.00 am – 1.00 pm

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**THE HEARING AID COUNCIL  
EXAMINATION PAPER 3 – October 2007**

**SECTION A**

**Answer FOUR of the following 5 questions:**

**3A1**

Explain the following:

- (i) Peak clipping. (4)
- (ii) Output limiting compression. (4)
- (iii) Wide dynamic range compression. (4)
- (iv) Syllabic compression. (4)
- (v) Discuss the difference between Fixed Frequency Response (FFR) and Level Dependent Frequency Response (LDFR) in compression systems. (4)

**3A2**

Answer ALL of the following:

- (i) What are the psycho-social consequences of acquiring a hearing loss? (6)
- (ii) What personal factors affect an individual's rehabilitation process? (6)
- (iii) What effect do these personal factors have on the choice of hearing instruments? (8)

**3A3**

Explain FIVE features of a digital hearing aid system and the ways in which these features could benefit the client. (4 marks each)

**3A4**

Explain the effects of each of the following on hearing aid systems:

- (i) Vents. (4)
- (ii) Tubing dimensions. (4)
- (iii) Horn effects. (4)
- (iv) Filters in tubing. (4)
- (v) Meatal depth of mould. (4)

**3A5**

What action would you take if the client complains that:

- (i) The aid does not work at all. (5)
- (ii) Sound is weaker than usual. (5)
- (iii) Aid has a scratchy sound. (5)
- (iv) The aid whistles. (5)

## **SECTION B**

### **Answer BOTH questions:**

#### **3B1**

- (i) List TEN conditions for which a client must be referred to Registered Medical Practitioner. (5)
- (ii) What equipment must a registered hearing aid dispenser have with them at every consultation? (5)
- (iii) When must audiometry be carried out by registered hearing aid dispenser? (5)
- (iv) List the requirements for a visit to a potential client by a registered hearing aid dispenser. (5)

#### **3B2**

- (i) What information must a registered hearing aid dispenser provide a client in writing before supplying or effecting the supply of a hearing aid? (6)
- (ii) What must the notified supervisor ensure in the case of a trainee who is an applicant for registration undergoing an adaptation period? (8)
- (iii) With respect to the Code of Practice what are the Employers' responsibilities towards trainees? (6)