

THE HEARING AID COUNCIL

EXAMINATION PAPER 1 – OCTOBER 2002 (2)

SECTION A

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

- 1A1** (a) Describe in detail the anatomy of the Eustachian tube. (6)
- (b) Explain its functions. (6)
- (c) What are the consequences of it not functioning properly? (6)
- (d) List 2 treatments a doctor might offer to a patient with Eustachian tube dysfunction? (2)
- Include diagrams wherever relevant.
- 1A2** (a) Briefly describe the function of the normal cochlea. (4)
- (b) How does the basilar membrane move when the ear is presented with a pure tone? (6)
- (c) What are the functions of the hair cells in the organ of Corti? (6)
- (d) What are auditory consequences of the loss of hair cells in a particular region of the cochlea? (4)
- 1A3** (a) List the 4 major symptoms of Meniere's disorder? (4)
- (b) Explain the particular problems that a Meniere's sufferer is likely to encounter with hearing aid use. (6)
- (c) How might Meniere's disorder be treated? (6)
- (d) List 4 other causes of a cochlear hearing loss. (4)
- 1A4** Write short notes on:
- (a) Barotrauma and the middle ear (4)
- (b) Ventilation tubes (grommets) (4)
- (c) Cholesteatoma (4)
- (d) Otosclerosis (4)
- (e) Wax (4)

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EXAMINATION PAPER 1 – OCTOBER 2002 (2)

SECTION B

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

- 1B1** (a) Describe the physical properties of sound in a sine wave. Include definitions of amplitude, phase, frequency and wavelength. (9)
- (b) The speed of sound is 340 metres per second. Find the wavelength of a 550 Hertz pure tone. (2)
- (c) Describe the acoustic chain of events that occur in the propagation of a sine wave in a room with hard surfaces. Include a definition of reverberation (9)
- 1B2** Audiometric tests for a particular client indicate that the bone conduction readings are appreciably worse than the air conduction readings. Discuss reasons that might account for this. (20)
- 1B3** Using diagrams where appropriate describe the BSA recommended rules of masking. For each rule, explain why the rule is necessary and what kind of error(s) might arise if it is not applied. (20)
- 1B4** (a) Briefly describe the acoustic properties and method of production of:-
- (i) vowel sounds (3)
 - (ii) fricative consonants (3)
 - (iii) plosive consonants (3)
- (b) Apart from speech sounds themselves (vowels and consonants), what features of speech help to convey meaning? (6)
- (c) Discuss the role of speech audiometry in hearing aid fitting. (5)

THE HEARING AID COUNCIL

EXAMINATION PAPER 2 – OCTOBER 2002 (2)

SECTION A

Answer THREE of the following four questions:

2A1 Discuss the requirements for good impressions and the factors involved in producing these. **(20)**

2A2 (a) Hearing aid data sheets give details of the full-on gain and the saturation sound pressure level (or maximum power output). Explain the differences between these. **(4)**

(b) Draw graphs showing typical full-on gain and sound pressure level data for a high power concha aid. **(4)**

(c) When prescribing an aid, why is it important to consider both the full-on gain and the saturation sound pressure level? **(4)**

(d) What is the reference test gain of a hearing aid and why is it used? **(4)**

(e) Briefly describe the difference between 2cc coupler and IEC ear simulator, used when measuring hearing aid performance in a test box (defined by standards IEC118/7 and 118/0) **(4)**

2A3 When is it desirable to control high output levels from a hearing aid? Describe how this is achieved in linear and non-linear aids. How do these techniques differ in their effects on signal clarity and speech discrimination for the hearing aid wearer? **(20)**

2A4 A client presents with hearing levels of 5-15dBHL at frequencies up to 1kHz, sloping steeply to 50-70dBHL at 2-8kHz. They have tried hearing aids 10 years ago but with no success.

(a) Describe the most common problems encountered in trying to assist this type of loss. **(8)**

(b) What hearing aid systems are now available that may offer your client more help? **(12)**

In your answer discuss the advantages and disadvantages for each hearing aid system described

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EXAMINATION PAPER 2 – OCTOBER 2002 (2)

SECTION B

You **MUST** answer Question 2B1.

2B1 What conditions are referable under the current HAC Code of Practice?
For each, discuss why the client is advised to seek medical advice if
he/she has not already done so. (20)

Answer **TWO** of the following three questions:

2B2 (a) Describe and explain the main problems experienced by people who
have normal hearing in one ear and no useful hearing in the other. (10)

(b) What help could you offer a client with this problem.
Discuss both advantages and disadvantages. (10)

2B3 In order to achieve the most complete and satisfactory rehabilitation of an adult
who has not worn hearing aids before, explain the importance of the following
stages:

(a) The case history. (4)

(b) The involvement of significant others during the first consultation. (3)

(c) The explanation to the client and to any "significant other" of the
audiogram. (3)

(d) Selection of type of hearing aid system. (3)

(e) The fitting of the hearing aid system. (3)

(f) The first follow-up appointment after hearing aid fitting. (4)

2B4 An elderly lady who lives in a flat on her own is brought to see you by her
daughter who is worried that her mother does not answer the door and the
telephone. The neighbours have also complained that the television is too loud.
The lady, however, denies that she has a hearing loss.
Discuss the stages of management for the lady. (20)

THE HEARING AID COUNCIL

EXAMINATION PAPER 3 – OCTOBER 2002 (2)

SECTION A

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

3A1 Discuss the requirements for good impressions and the factors involved in producing these. (20)

3A2 (a) Hearing aid data sheets give details of the full-on gain and the saturation sound pressure level (or maximum power output). Explain the differences between these. (4)

(b) Draw graphs showing typical full-on gain and sound pressure level data for a high power concha aid. (4)

(c) When prescribing an aid, why is it important to consider both the full-on gain and the saturation sound pressure level? (4)

(d) What is the reference test gain of a hearing aid and why is it used? (4)

(e) Briefly describe the difference between 2cc coupler and IEC ear simulator, used when measuring hearing aid performance in a test box (defined by standards IEC118/7 and 118/0) (4)

3A3 When is it desirable to control high output levels from a hearing aid? Describe how this is achieved in linear and non-linear aids. How do these techniques differ in their effects on signal clarity and speech discrimination for the hearing aid wearer? (20)

3A4 A client presents with hearing levels of 5-15dBHL at frequencies up to 1kHz, sloping steeply to 50-70dBHL at 2-8kHz. They have tried hearing aids 10 years ago but with no success.

(a) Describe the most common problems encountered in trying to assist this type of loss. (8)

(c) What hearing aid systems are now available that may offer your client more help? (12)

In your answer discuss the advantages and disadvantages for each hearing aid system described

3A5 In relation to compression aids, explain the terms:

(a) compression ratio (4)

(b) knee point (4)

(c) input compression (4)

(d) output compression (4)

(e) wide dynamic range compression (4)

THE HEARING AID COUNCIL

EXAMINATION PAPER 3 – OCTOBER 2002 (2)

SECTION B

You **MUST** answer **BOTH** questions:

3B1 What conditions are referable under the current HAC Code of Practice?
For each, discuss why the client is advised to seek medical advice if
he/she has not already done so. (20)

3B2 The following statement forms a written representation by a non-medically
qualified hearing aid dispenser. It is not compliant with the HAC Code of
Practice. With reference to all of the relevant clauses, detail the inaccuracies
and rewrite the statement so that it is fully compliant. (20)

*“I am an audiologist providing private hearing aid services at my clinic in your
locality. I am a hearing aid dispenser registered as required by the Hearing Aid
Council Act. At my clinic I have successfully treated many patients suffering with
hearing loss, tinnitus and other conditions of the ear. My staff of registered
consultants are available by appointment at our Head Office, The Hearing Institute.”*