

# THE HEARING AID COUNCIL

## EXAMINATION PAPER 1 – APRIL 2006(1)

### SECTION A

Answer **THREE** of the following questions:

#### 1A1

- (a) Describe the anatomy of the external auditory canal, up to but not including the tympanic membrane. Use diagrams if you wish. **10**
- (b) List two functions of wax. **2**
- (c) How does the normal auditory canal modify the acoustic input to the middle ear? **2**
- (d) List two **non-infectious** conditions of the external auditory canal. **2**
- (e) How is the acoustic input affected by each of the two conditions described (d) above? **4**

#### 1A2

- (a) Draw a cross section of the cochlea and label all parts. **8**
- (b) Explain the passage of vibration through the cochlea resulting in the production of an action potential. **6**
- (c) Name 3 ototoxic drugs. **3**
- (d) Name 3 effects of ototoxic drugs on the cochlea. **3**

#### 1A3

- (a) List 4 causes of hearing loss that can be prevented. **2**
- (b) How might each of them be prevented? **6**
- (c) How does each one of them lead to a hearing loss? **6**
- (d) What type of hearing loss results from each of these causes? Use diagrams where necessary. **6**

*questions continue on next page*

**1A4**

Write short notes on **four** of the following five subjects

- |     |                              |          |
|-----|------------------------------|----------|
| (a) | ventilation tubes (grommets) | <b>5</b> |
| (b) | hyperacusis                  | <b>5</b> |
| (c) | barotrauma                   | <b>5</b> |
| (d) | chronic otitis media         | <b>5</b> |
| (e) | non-organic hearing loss     | <b>5</b> |

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## EXAMINATION PAPER 1 – APRIL 2006(1)

### SECTION B

Answer THREE of the following questions:

#### 1B1

List BSA recommended procedures for the subjective tests that should be carried out on the audiometer for the following:

- (a) Stage A: Daily check tests **8**
- (b) Stage A: Weekly check tests **8**
- (c) When are Stage B and Stage C objective calibrations carried out? **4**

#### 1B2

- (a) How do the acoustic features of speech differ from those of a sustained 1kHz pure tone? **10**
- (b) Your client has a severe sensorineural hearing loss above 1kHz, but normal hearing in the low frequencies. How is speech perception likely to be affected? **10**

#### 1B3

- (a) Discuss the purpose of masking in pure tone audiometry. **8**
- (b) The client's average **not masked** pure tone thresholds are as follows:
  - bone conduction 40dBHL
  - left air conduction 80dBHL
  - right air conduction 90dBHL

Masking is required.

- (i) Why might obtaining true thresholds be difficult? **3**
- (ii) What are the possible true thresholds? **9**

*questions continue on next page*

**1B4**

Write short notes on **four** of the following five subjects

- |     |                                |          |
|-----|--------------------------------|----------|
| (a) | periodic and aperiodic sounds; | <b>5</b> |
| (b) | abnormal loudness growth       | <b>5</b> |
| (c) | narrow band masking            | <b>5</b> |
| (d) | equal loudness contours        | <b>5</b> |
| (e) | standing waves                 | <b>5</b> |

# THE HEARING AID COUNCIL

## EXAMINATION PAPER 2 – APRIL 2006(1)

### SECTION A

Answer **THREE** of the following questions:

- 2A1** Two clients each have a moderate bilateral hearing loss, one typically sensorineural and the other typically conductive.
- (a) Describe the hearing difficulties that these two clients would have in various listening conditions. How might these difficulties be similar or different for each client? **7**
  - (b) Your **general** recommendations for a hearing aid system may not be the same for each client. Describe the similarities and differences. **6**
  - (c) You choose to specifically advise a programmable, digital hearing aid system for each client. In what ways would your approach to programming the hearing aid system result in different performance characteristics. **4**
  - (d) Describe why you would take these different performance characteristic approaches? **3**
- 2A2**
- (a) Describe, with the use of simple diagrams, how a digital signal processing (DSP) hearing aid functions. Describe how it differs from a digitally programmable analogue hearing aid. **8**
  - (b) Explain the various compression strategies that can be employed by a DSP hearing system to maximise a client's understanding of speech in noise. **12**
- 2A3**
- (a) List the steps of impression taking on a client who is regularly exhibiting feed-back problems with a powerful behind-the-ear hearing aid system. **10**
  - (b) Throughout the impression procedure, what inspections and actions must you take to ensure safe practice? **10**

*questions continue on next page*

## 2A4

Using the blank pure tone audiogram provided, enter all necessary readings which would illustrate a case of bilateral, significant asymmetrical, sensorineural hearing loss. The degree of hearing loss in both ears should enable bilateral fitting.

With reference to the audiogram you have drawn, answer the following questions:

- (a) Complete audiogram as requested above. **4**
- (b) Explain in detail what you would consider to be the two main hearing problems associated with the asymmetrical hearing. **5**
- (c) If only a unilateral hearing aid system is being fitted, explain what factors you would take into account in deciding which ear to fit. **5**
- (d) If fitting this case bilaterally with a programmable DSP hearing aid system, briefly explain how your amplification strategy may be different for each ear. **6**

# THE HEARING AID COUNCIL

## EXAMINATION PAPER 2 – APRIL 2006(1)

### SECTION B

**All candidates must answer question 2B1 and TWO out of the other 3 questions.**

#### 2B1

- (a) You recommend that a client purchases a binaural system but the client is adamant that he only wants a monaural system. What must you do to comply with the Code? 4
- (b) What should you do if a client would benefit from a top of the range DSP system, but has limited financial resources? 4
- (c) What would you do if you notice that a colleague is not masking audiograms properly? 4
- (d) Your client cancels an order outside the agreed thirty day refund period specified on your receipt. You are able to return the aid to the manufacturer for credit. Is the client entitled to any refund? 4
- (e) Otoscopic examination reveals a wax build-up in the client's ears. Can you perform an audiogram? 4

#### 2B2

New clients are advised that they need time to adapt to their new hearing aid instruments

- (a) Explain why this is and what processes need to occur. 5
- (b) What advice would you give a client to support them through this initial acclimatisation stage? 5
- (c) How would you advise a client to respond constructively when they fail to hear somebody talking to them? 5
- (d) List 5 other actions that are either to do with the environment, the speaker or the hearing impaired listener that will facilitate effective communication. 5

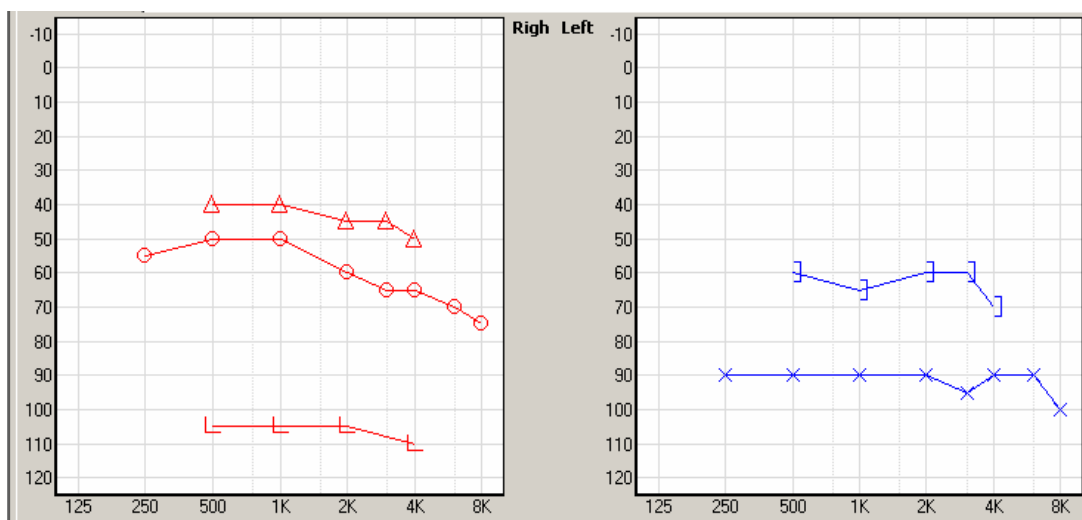
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**2B3**

Dr Bertram aged 64yrs is a retired GP. She retired early due to increasing problems with hearing and vision but remains very active with charity work and various committees.

The cause of her hearing loss was identified as otosclerosis for which she had a unilateral stapedectomy ten years ago. Dr Bertram also complains of continuous tinnitus.

Dr Bertram comes to see you for a hearing assessment and informs you that she is really struggling to chair her meetings and to hold a conversation at social functions because she cannot hear effectively with her current aid provision. Her current aid provision is a monaural BTE fitted to her right ear.



- (a) What considerations must you make when calculating gain for someone with otosclerosis ? 3
- (b) Give 4 reasons why you think Dr Bertram may have been fitted with a monaural BTE only to her right ear 4
- (c) Give 4 reasons why you feel Dr Bertram would benefit from a hearing aid in both ears. 4
- (d) Explain why wearing bilateral hearing aids can often be an advantage for people with tinnitus 4
- (e) Would you choose a WDRC or compression limiting approach to this fitting ?  
Explain why you made this choice. 4
- (f) What earmould style would you use for the left ear ? 1

*questions continue on next page*

## **2B4**

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” about 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**

# THE HEARING AID COUNCIL

## EXAMINATION PAPER 3 – APRIL 2006(1)

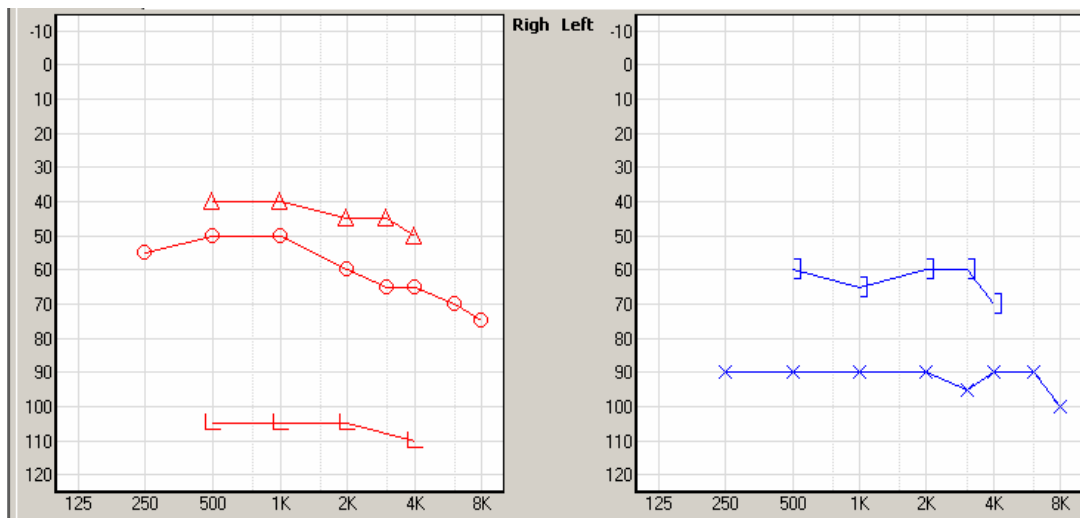
### SECTION A

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

- 3A1** Two clients each have a moderate bilateral hearing loss, one typically sensorineural and the other typically conductive.
- (a) Describe the hearing difficulties that these two clients would have in various listening conditions. How might these difficulties be similar or different for each client? **7**
  - (b) Your **general** recommendations for a hearing aid system may not be the same for each client. Describe the similarities and differences. **6**
  - (c) You choose to specifically advise a programmable, digital hearing aid system for each client. In what ways would your approach to programming the hearing aid system result in different performance characteristics. **4**
  - (d) Describe why you would take these different performance characteristic approaches. **3**
- 3A2**
- (a) Describe, with the use of simple diagrams, how a digital signal processing (DSP) hearing aid functions and how it differs from a digitally programmable analogue hearing aid. **8**
  - (b) Explain the various compression strategies that can be employed by a DSP hearing system to maximise a client's understanding of speech in noise. **12**

*questions continue on next page*

**3A3** Dr Bertram aged 64yrs is a retired GP. She retired early due to increasing problems with hearing and vision but remains very active with charity work and various committees. The cause of her hearing loss was identified as otosclerosis for which she had a unilateral stapedectomy ten years ago. Dr Bertram also complains of continuous tinnitus. Dr Bertram comes to see you for a hearing assessment and informs you that she is really struggling to chair her meetings and to hold a conversation at social functions because she cannot hear effectively with her current aid provision. Her current aid provision is a monaural BTE fitted to her right ear.



- (a) What considerations must you make when calculating gain for someone with otosclerosis ? **3**
- (b) Give 4 reasons why you think Dr Bertram may have been fitted with a monaural BTE only to her right ear **4**
- (c) Give 4 reasons why you feel Dr Bertram would benefit from a hearing aid in both ears **4**
- (d) Explain why wearing bilateral hearing aids can often be an advantage for people with tinnitus **4**
- (e) Would you choose a WDRC or compression limiting approach to this fitting ? Explain why you made this choice. **4**
- (f) What earmould style would you use for the left ear ? **1**

*questions continue on next page*

**3A4** Using the blank pure tone audiogram provided, enter all necessary readings which would illustrate a case of bilateral, significant asymmetrical, sensorineural hearing loss. The degree of hearing loss in both ears should enable bilateral fitting.

With reference to the audiogram you have drawn, answer the following questions:

- (a) Complete audiogram as requested above. **4**
- (b) Explain in detail what you would consider to be the two main hearing problems associated with the asymmetrical hearing. **5**
- (c) If only a unilateral hearing aid system is being fitted, explain what factors you would take into account in deciding which ear to fit. **5**
- (d) If fitting this case bilaterally with a programmable DSP hearing aid system, briefly explain how your amplification strategy may be different for each ear. **6**

**3A5**

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” about 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**

# THE HEARING AID COUNCIL

## EXAMINATION PAPER 3 – APRIL 2006(1)

### SECTION B

Answer **BOTH** questions:

#### 3B1

- (a) You recommend that a client purchases a binaural system, but the client is adamant that he only wants a monaural system. What must you do to comply with the Code? **4**
- (b) What should you do if a client would benefit from a top of the range DSP system, but has limited financial resources? **4**
- (c) What would you do if you notice that a colleague is not masking audiograms properly? **4**
- (d) Your client cancels an order outside the agreed thirty day refund period specified on your receipt. You are able to return the aid to the manufacturer for credit. Is the client entitled to any refund? **4**
- (e) Otoscopic examination reveals a wax build-up in the client's ears. Can you perform an audiogram? **4**

#### 3B2

- (a) The Hearing Aid Code of Practice enables a dispenser to make home visits which are requested or agreed to by the client, provided that certain requirements are met. Describe in detail the requirements of **two** of these sub-clauses. **10**
- (b) The HAC Code of Practice specifies what information a dispenser must give in writing to a client before providing or effecting the supply of a hearing aid system. Describe in detail the information of **five** of these sub-clauses. **10**