

THE HEARING AID COUNCIL

EXAMINATION PAPER 1 – April 2007

SECTION A

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

- 1A1**
- (a) Draw an annotated diagram of the ossicular chain – include the tympanic membrane. (5)
 - (b) Describe the function of this system. (5)
 - (c) Describe briefly what you understand by the term otosclerosis. (5)
 - (d) Show with the aid of an audiogram the effect of otosclerosis on hearing. (5)
- 1A2** Write short notes on:
- (a) Diplacusis, (4)
 - (b) Hyperacusis, (4)
 - (c) Presbycusis (4)
 - (d) Loudness Recruitment (4)
 - (e) Adaptation (4)
- 1A3**
- (a) List the FOUR 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 FOUR other causes of a cochlear hearing loss. (4)
- 1A4**
- (a) Why does the middle ear need an impedance matching mechanism? (2)
 - (b) Describe the impedance matching mechanism (8)
 - (c) Name the middle ear muscles and describe their function. (4)
 - (d) What information can be gained from middle ear measurements? (6)

SECTION B

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

- 1B1** Explain the difference between the following acoustical terms
- a) Amplitude and intensity (4)
 - b) Frequency and period (4)
 - c) Phase and Cycle (4)
 - d) Warble and Narrowband Noise (4)
 - e) White Noise and Pink Noise (4)
- 1B2** Answer all of the following :
- a) Define dBSPL in terms of sound pressure. (2)
 - b) If 10dB signifies a 10 fold increase, what increase is signified by 20dB? (2)
 - c) State what dBA scale is based on. (2)
 - d) What is the subjective quality associated with frequency of a tone? (2)
 - e) What is the subjective quality associated with intensity? (2)
 - f) Define threshold of hearing (2)
 - g) Is the masking effect greater for sounds of similar or dissimilar frequency? (2)
 - h) What phenomenon results from a reduction in dynamic range? (2)
 - i) State one means by which we localise sounds? (2)
 - j) State the increase in dB due to binaural summation. (2)
- 1B3**
- a) What daily checks of masking function should be made? (2)
 - b) Explain effective masking level in terms of manual threshold measurement and audiometric equipment calibrated to BS EN ISO 389-4 and how it is found? (4)
 - c) Prior to conducting a hearing test the client, when asked, reports tinnitus “a continuous non-distressing ringing in the head for many years” – explain the instructions given and how you would proceed with the test. (4)
 - d) not-masked results of this same client shows a 50-60dB bilateral symmetrical AC loss with an air-bone gap of approximately 20dB across the four frequencies – Which rule of masking is relevant and how would you proceed? (8)
 - e) what details should be entered on the Audiogram? (2)

- 1B4**
- (a) Define abnormal loudness growth. (2)
 - (b) List three tests that could establish the presence of abnormal loudness growth. (3)
 - (c) Describe the test procedure of one of these tests. (5)
 - (d) Where in the auditory pathway is the site of lesion usually associated with abnormal loudness growth? (2)
 - (e) Describe one theory to explain abnormal loudness growth (8)

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EXAMINATION PAPER 2 – April 2007

SECTION A

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

2A1

How would you proceed when a client who is wearing a recently fitted, all-in-the-ear hearing aid system for the first time, complains about the following difficulties:

- (a) that their own voice sounds too loud (5)
- (b) when using the telephone, the hearing aid feeds back (5)
- (c) other peoples' voices are louder but not clear enough (5)
- (d) the aid is difficult to fit and the area around the helix is very sore (5)

2A2 Answer all the following:

- (a) Discuss the use of venting and varying sound bore dimensions in ear mould technology (6)
- (b) What is meant by term "real ear Measurements"? Briefly outline its role in auditory rehabilitation. (6)
- (c) Discuss the use of compression systems in hearing aids (8)

2A3

- a) Draw an audiogram for a typical case of noise induced hearing loss (NIHL) (3)
- b) Draw a labelled frequency response curve for an eight channel, DSP hearing aid which would be suitable for a typical case of NIHL (5)
- c) With reference to the diagram drawn for part b), explain how the amplification required in one lower frequency channel would be different from that required in one higher frequency channel (6)
- d) Why would a two channel hearing aid be less beneficial in this case of NIHL? (6)

2A4

In relation to very small behind the ear hearing aid systems using ‘open ear technology’, describe the following:-

- a) Their physical characteristics which distinguish them from other hearing aid systems (5)
- b) The hearing losses to which they are best suited (5)
- c) Their possible advantages (5)
- d) Their possible limitations (5)

SECTION B

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

- 2B1**
- (a) Why do we have a Code of Practice? (5)
 - (b) The Code contains 30 clauses organised into 5 sections. What issues are the sections designed to address? (5)
 - (c) Illustrate your answer with specific examples. (10)

- 2B2** New clients are advised that they need time to adapt to their new hearing instruments;
- (a) Explain why this is and what processes need to occur (5)
 - (b) What advice would you give the 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)

2B3 You have a client who is considering acquiring a hearing aid system and whose audiogram shows a typical presbycusis pattern for a person in their mid seventies. This client has an active social and family life as well as being a regular churchgoer.

- (a) Describe this client's likely hearing impairment. (4)
- (b) Detail the hearing problems, which this client is likely to experience, based on the lifestyle described. (6)
- (c) Explain your recommendations for a programmable, digital hearing aid system. Include any specific technical features, which may be beneficial to this client and the reasons why they may be helpful (10)

2B4

- (a) Explain what is meant by the occlusion effect in association with hearing aids. (6)
- (b) Explain which features of earmould and shell design affect occlusion (6)
- (c) What audiometric results would suggest that a patient would be likely to report occlusion? (4)
- (d) What is meant by the viscosity of an aural impression material and why is it important? (4)

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EXAMINATION PAPER 3 – April 2007

SECTION A

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

3A1

How would you proceed when a client who is wearing a recently fitted, all-in-the-ear hearing aid system for the first time, complains about the following difficulties:

- (a) that their own voice sounds too loud (5)
- (b) when using the telephone, the hearing aid feeds back (5)
- (c) other peoples' voices are louder but not clear enough (5)
- (d) the aid is difficult to fit and the area around the helix is very sore (5)

3A2 Answer all the following:

- (a) Discuss the use of venting and varying sound bore dimensions in ear mould technology (6)
- (b) What is meant by term "real ear Measurements"? Briefly outline its role in auditory rehabilitation. (6)
- (c) Discuss the use of compression systems in hearing aids (8)

3A3

- (a) Draw an audiogram for a typical case of noise induced hearing loss (NIHL) (3)
- (b) Draw a labelled frequency response curve for an eight channel, DSP hearing aid which would be suitable for a typical case of NIHL (5)
- (c) With reference to the diagram drawn for part b), explain how the amplification required in one lower frequency channel would be different from that required in one higher frequency channel (6)
- (d) Why would a two channel hearing aid be less beneficial in this case of NIHL? (6)

3A4

In relation to very small behind the ear hearing aid systems using 'open ear technology', describe the following:-

- (a) Their physical characteristics which distinguish them from other hearing aid systems (5)
- (b) The hearing losses to which they are best suited (5)
- (c) Their possible advantages (5)
- (d) Their possible limitations (5)

3A5 Difficulty in hearing both clearly and comfortably in difficult listening conditions is a common problem for those with sensorineural hearing loss.

- (a) Explain the term 'signal-to-noise ratio' (4)
- (b) Explain what your recommendations for a hearing aid system might be in order to minimise the problem of
 - (i) poor speech discrimination (8)
 - (ii) uncomfortable loudness in the presence of noise (8)

SECTION B

Answer **BOTH** questions:

3B1 Write short notes on the following. In each case why do you think restrictions should apply?

- (a) The restrictions on surveys regarding hearing loss (clause 17) (4)
- (b) The requirements for dispensers to service hearing aids (clause 18) (4)
- (c) Guarantee period for new hearing aids (clause 19) (4)
- (d) How dispensers may refer to their premises (clause 16) (4)
- (e) The requirements for a calibrated audiometer (clause 8) (4)

3B2 In order to comply with the HAC Code of Practice:

- (a) How far in advance can a prior arrangement be made for a home visit? (4)
- (b) Before supplying a hearing aid system, to what standard must the audiometry be carried out and what information must be recorded about the audiometer used? (8)
- (c) Before supplying or effecting the supply of a hearing aid, what information must the dispenser provide to the client in writing (8)
(Clause 11).