



I Semester M.Sc. Examination, December 2011/January 2012
(Scheme – CBCS)
(Speech and Hearing)/(AUD)/(HC)
Research Methods and Statistics in Speech-Language and Hearing

Time : 2 Hours

Max. Marks : 50

Instruction : Answer all questions.

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| I. 1) | Explain how research trends have changed over past three decades in the field of Audiology and Speech Pathology. | 10 |
| OR | | |
| 2) a) | Write a brief note on observation methods in research. | 5 |
| b) | Explain standard group comparison design. | 5 |
| II. 3) a) | Define experimental design. Compare and contrast single subject designs with group designs. | 10 |
| b) | Write on ethical issues in research. | 5 |
| OR | | |
| 4) | Highlight the importance of various factors to be considered in the documentation of research. | 15 |
| III. 5) a) | Explain the rationale of correlation and regression. | 5 |
| b) | Compare and contrast between independent and paired t-test. | 5 |
| c) | What are the assumptions and types of ANOVA ? | 5 |
| OR | | |
| 6) a) | Write a brief essay on various types of multivariate analysis. | 10 |
| b) | What are the applications of ANOVA ? | 5 |
| IV. 7) a) | Explain the rationale or assumptions of non-parametric tests. | 5 |
| b) | Write a brief note on measures of association. | 3 |
| c) | What is Chi-square test ? | 2 |
| OR | | |
| 8) | Illustrate the application of non-parametric tests in the field of speech and hearing research. | 10 |

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I Semester M.Sc. (AUD) Examination, December 2011/January 2012
(CBCS Scheme)
Audiology
HC : Auditory Physiology

Time : 2 Hours

Max. Marks : 50

Instruction : Answer *all* questions.

- ossicle Smith SR-20.12.11*
- I. 1) Discuss the role of ~~cracles~~ ossicles of the middle ear in sound transmission. 10
- OR
- 2) Explain the mechanisms of eustachian tube functions. 10
- II. 3) Write about the micro anatomy of the cochlea and its importance to understand cochlear physiology. 15
- OR
- 4) What are the proteins present in the cochlea ? How are they important in functioning of different cochlear structures ? 15
- III. 5) Discuss the importance of resting potentials in cochlear transduction. 15
- OR
- 6) Explain how non-linearity is manifested in the cochlea ? 15
- IV. 7) Explain the vestibulo-spinal reflex pathway and its physiology. 10
- OR
- 8) How does motor theory of hearing help understand the cochlear physiology ? 10



I Semester M.Sc. (AUD) Examination, December 2011/January 2012
(Scheme : CBCS)
Audiology
HC : Basics in Auditory Perception

Time : 2 Hours

Max. Marks : 50

Instruction : Answer all.

- I. 1) Discuss about the concept of theory of signal detection and its application in the field of audiology. 10
- OR
- 2) List all adaptive psychophysical methods in threshold estimation. Explain any one in detail. 10
- II. 3) Enumerate on methods of estimating DLF. 15
- OR
- 4) Write notes on : 5
- a) Loudness of complex signal. 5
 - b) Ohm's acoustic law. 5
 - c) Pitch of complex signal. 5
- III. 5) Discuss about the various methods adopted to estimate temporal resolution in humans. 15
- OR
- 6) Write a note on timber perception. 15
- IV. 7) Write an experiment to study auditory scene analysis in a 25 year old adult with normal hearing. 10
- OR
- 8) Discuss various factors that influence auditory object perception in humans. 10
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**I Semester M.Sc.(Aud.) Examination, December 2011/January 2012****(Scheme : CBCS)****Audiology****Physiological Assessment of the Auditory System (HC)**

Time: 2 Hours

Max. Marks: 50

1. Explain how Vanhusen's classification of tympanometry helps in differential diagnosis of middle ear disorders. **15**

OR

2. Give the clinical importance of the following : **(5×3=15)**

- a) Tympanometric gradient
- b) Resonance frequency
- c) Peak pressure of the middle ear

3. What is acoustic reflex growth function ? Explain its clinical importance. **10**

OR

4. What are the clinical implications of acoustic and non-acoustic reflexes in the differential diagnosis of auditory pathologies ? **10**

5. Explain the rationale and clinical implications of taxonomy based generation of OAEs. **10**

OR

6. Write a research proposal to evaluate the usefulness of SOAEs in evaluating individuals with tinnitus. **10**

7. With a block diagram explain the instrumentation required to record TEOAE, DPOAE and SFOAE. **15**

OR

8. What is the role of OAEs in differential diagnosis and management of auditory disorders ?
How can OAEs can be used to evaluate the integrity of medial olivo cochlear bundle ? **15**
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I Semester M.Sc. Examination, December 2011/January 2012

(Scheme : CBCS)

(Aud./SLP./S & H.)

SC : Technology for Speech-Language and Hearing

Time : 2 Hours

Max. Marks : 50

1. a) An audiometer requires DC power supplies of 5 volts, 12 volts. etc., for its functioning. Illustrate how these power supplies are generated inside the audiometer, when it is connected to ac mains. 5

- b) An amplifier needs to be implemented in a hearing aid of analog type. Which analog device will you select for this job ? How does it amplify ? 5

OR

2. a) Which type of microphone would you prefer to record a speech sample ? Justify. Explain the structure and principle of operation of this microphone. 5

- b) You have to give speech therapy to your client in another country. Explain how will you establish a link with your client. 5

3. a) An analog to digital converter is to be implemented in a digital hearing aid. How will you decide the sampling rate ? Justify. 5

- b) A digital to analog converter needs to be implemented in an audiometer. How will you prepare the analog signal as per the requirement of TDH 39 headphone ? Explain. 5

OR

4. a) Which decomposition technique is preferred to split a speech signal while preparing it for digital signal processing ? Justify. 5

- b) If you have to filter a speech signal, FIR filter is preferred over IIR filter. Do you agree with this ? Give reasons to support your answer. 5

5. a) Explain the technology used for implementing the following signal processing strategies in a digital hearing aid. 5

i) BILL

ii) Feedback cancellation.

- b) Explain how Adaptive FM is implemented in an FM hearing aid system. 5

- c) "Induction loop system is a cost-effective classroom amplification system". Do you agree with this ? Justify your answer. 5

OR



6. a) "LPC analysis is the most accurate technique for speech analysis". Justify. 5
- b) Speech signal varies relatively slowly with time". Explain two techniques of speech analysis which is based on this assumption. 5
- c) Explain the process of speech synthesis. 5
7. a) "When you use 'N' stimuli to elicit an auditory evoked response, the signal to noise ratio of the averaged response enhances by \sqrt{N} times". Prove this with scientific reasoning. 5
- b) Explain the technology used for generating the following stimuli : 10
- i) Tone burst
 - ii) Warble tone
 - iii) Click
 - iv) Filtered click.
- OR
8. a) "Technology behind obtaining a glottal waveform in an electroglottograph is just mapping the resistance change". Elaborate. 5
- b) Explain the principle of operation of an articulograph. 5
- c) Illustrate the components of a CSL and explain the role of each one. 5

OR

**I Semester M.Sc. (Aud.) Examination, December 2011/January 2012****(Scheme : CBCS)****Audiology****SC : Diseases of the Ear and Auditory and Auditory Pathway**

Time : 2 Hours

Max. Marks : 50

Instruction : Answer **all** questions. Draw diagrams **wherever** necessary.

- I. 1) Describe the anatomy of the middle ear and make a note on Eustachian tube **10**
OR
- 2) a) Explain the central auditory pathway. **5**
b) Describe the anatomy of the facial nerve. List tests to assess the level of the facial nerve lesion. **5**
- II. 3) Mention the diseases of the external ear and describe malignant otitis externa. **15**
OR
- 4) Describe the clinical features, audiological evaluations and management of chronic suppurative otitis media. **15**
- III. 5) a) Noise induced hearing loss. **5**
b) Ototoxic drugs **5**
c) BAHA. **5**
OR
- 6) a) Classify the ototoxic drugs and its effects on hearing. Explain the medicolegal implications of ototoxic drugs. **10**
b) Traumatic injuries of the inner ear. **5**
- IV. 7) a) Tympanoplasties its types and procedures. **6**
b) Endolymphatic sac decompression. **4**
OR
- 8) Describe the surgical management for hearing improvement in conductive hearing losses. **10**
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