

# MSC SP - AA 010/LA 010

M.Sc. I Sem. Examination, November/December 2004  
(Semester Scheme) (Common Paper)  
Audiology/Speech-Language Pathology  
Research Methods in Speech-Language and Hearing

Time: 3 Hours

Max. Marks: 80

*Instruction: Answer all questions.*

- I. 1. a) Describe what is clinical and applied research with examples. 10  
b) Discuss various measures of hearing acuity and communicative behaviour. 6
- OR
2. a) Discuss the methods of observation. 8  
b) Discuss normative research and standard group comparison with examples. 8
- II. 3. a) Discuss single subject designs with an example. 10  
b) Describe the outline of a typical diagnostic report on an adult client. 6
- OR
4. a) Discuss the ethics of research. 8  
b) What are the problems common to design strategies ? 8
- III. 5. a) List 20 journals in which articles on speech and hearing occur. 10  
b) Critically evaluate the methods used in research on auditory physiology. 6
- OR
6. a) Discuss the methods unique to research in the area of speech perception. 8  
b) Discuss any two studies in speech and hearing as established in standard journals. 8
- IV. 7. a) What were the major developments and inventions in speech research between 1970-1990 ? 8  
b) Discuss research methods used in audiology research in the period 1950-1960. 8

OR

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8. a) What were the major developments and inventions in audiology research between 1970-1990 ? 8
- b) Critically evaluate research methods used in speech pathology in the period 1950-1960 and suggest how one can improve on them. 8
- V, 9. a) What are the methods of research used in Linguistics ? 10
- b) Discuss methods adopted to derive epidemiological data in communication disorders. 6
- OR
10. a) Suggest a research proposal to study epidemiology of language disorders.
- b) Discuss any one experimental research used in acoustics as applicable to language research. 8
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# MSCSP/AA 020/LA 020

M.Sc. (SLP)/M.Sc. (Aud.) I Sem. Examination, Nov./Dec. 2004  
(Common Paper) (Integrated Semester System)  
Speech and Hearing  
Statistics in Speech-Language and Hearing

Time: 3 Hours

Max. Marks: 80

*Instruction : Answer all questions.*

- I. 1. a) Discuss the application of statistical inference in speech-language pathology and audiology with specific examples. 10  
b) Briefly describe measures of central tendency and variability. 6  
OR  
2. a) What do you mean by probability ? Explain briefly the laws of probability with suitable examples. 10  
b) Write notes on Chi-square and population estimate. 6  
II. 3. a) What are the basic assumptions underlying analysis of variance ? 4  
b) Calculate 'F value and interpret the obtained F value with the significance level for the data given below : 12

Subjects	Control Gp.	Exptl Group - 1	ExptL Group - 2
A	6	12	16
B	5	14	12
C	4	13	14
D	6	12	14
E	5	12	14
F	5	12	15

OR

4. a) Differentiate between correlation and regression with suitable examples. 6

- b) Calculate correlation co-efficient for the data given below and interpret the obtained correlation. 10

Subject   / Candidates->	A	B	C	D	E	F	G
Marks in PSY	12	14	12	10	10	12	14
Marks in AUD	11	17	13	8	9	16	18

- III. 5. a) Differentiate between parametric and non-parametric statistics with specific examples. 8

- b) Apply the Mann-Whitney U-test for the data given below and indicate whether there is difference between X and Y in significant. 8

X	47	44	40	35	32	31	30	29	25	24	10	12
Y	48	45	43	42	39	36	33	28	23	21	15	14

6. a) What do you mean by non-normal distributions ? Explain the reasons for non-normal distributions. 10

- b) Describe the central limit theorem. 6

- IV. 7. a) What are the methods employed in the analysis of qualitative data ? Describe in detail. 8

- b) Calculate contingency co-efficient for the table given below and comment on its significance. 8

Sex		
Response	Male	Female
YES	75	30
NO	25	70

OR

8. a) Give detailed accounts on Kappa co-efficient and content analysis. 10  
b) Describe various types of log-linear models with suitable examples. 6

- V. 9. a) Critically analyse the need for multivariate analysis in the speech-language and hearing field. 10

- b) Explain the assumptions underlying multi-dimensional scaling. 6

OR.

10. a) Explain the various methods employed in the multi-variate analysis with examples. 8

- b) Explain the term 'principal component analysis'. 8

# MSC SP-AA 030/LA 030

M.Sc. I Sem. Examination, Nov./Dec. 2004  
(Semester Scheme) (Common Paper)  
Audiology/Speech Language Pathology  
Technology for Speech-Language and Hearing

Time : 3 Hours

Max. Marks : 80

*Instruction: Answer all questions.*

- I. 1. a) Explain, with the help of a neat block diagram, the working of a D.C. power supply. 5
- b) Explain the working of a 4-bit binary counter. 5
- c) List out the specifications of a personal computer that you would like to buy for audiology clinic. Justify your specifications. 6

OR

2. a) Describe briefly the different types of magnetic memory devices used in a computer. 8
- b) Describe briefly the structure of a CD and illustrate how information is written into it. 6
- c) Define (a) bit and (b) byte. 2
- II. 3. a) Describe the concept of satellite communication. How do you employ it for telerehabilitation of your clients ? 6
- 4 b) Discuss the advantages of DSP over analog processing. 7
- c) Write a brief note on delta modulation. 3

OR

4. a) How do you code a speech waveform using pulse code modulation ? 5
- b) What are the advantages of FM transmission over AM transmission ? How do you make use of FM technology in a classroom for hearing impaired ? 5
- c) Describe how a D/A converter transforms a given digital value to an equivalent analog value. 6
- III. 5. a) How do you generate a broadband click stimulus ? Explain with the help of a neat sketch. 5
- b) What factors would you consider, with respect to electrodes, to elicit a good ABR recording ? Are these factors different for recording with cup and needle electrodes ? If yes, then how are they different ? 9
- c) What is a condensation click and a rarefaction click ? 2

OR

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6. a) What is averaging ? Why is it done ? How do you do that in evoked potential system ? What is the difference in averaging between ABR recording and EEG recording, and why ? 10
- b) Describe the concept of CMR and explain how it eliminates noise. 6
- IV 7. a) Describe the compression techniques used in hearing aids. 10
- b) What is template matching technique ? Where is it employed ? What is the rehandle of the technique and how is it realized ? 6
- OR
8. a) Explain the working of a FM hearing aid (with a block diagram). Discuss the merits of FM system over other group hearing systems. 10
- b) Describe the different classes of speech recognition systems. 6
- V. 9. a) Discuss the advantages of CT over X-ray imaging. 6
- b) Explain how ultrasound analysis can be utilized in blood flow studies. 4
- c) Discuss the complexities involved in EEG recording and how do you solve them ? 6
- OR
10. a) Draw a block diagram of an EMG system and describe the functioning of each block. What is the application of EMG techniques in speech research ? 6
- b) Explain briefly the working principles of MRI. 4
- c) Draw a block diagram of a CT scanner and explain the function of each block. 6
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MSCAD/AA040

M.Sc I Semester Examination, November/December 2004  
(Semester Scheme)  
Speech and Hearing  
Audiology  
Auditory Physiology

Time: 3 Hours

Max. Marks: 80

*Instruction; Answer all questions.*

- I. 1. a) Describe the anatomy of the temporal bone. 10  
b) Discuss the importance of the external ear in man. 6  
OR  
2. a) Compare the role of pinna in lower mammals and humans. 8  
b) Describe the changes in the resonance properties of the external ear with age. 8  
3. a) Compare the acoustic and non-acoustic reflex pathways. 7  
b) Describe the important role played by the middle ear in man. 9  
OR  
4. a) Describe the anatomy and physiology of the Eustachian tube. 12  
b) What is the role of the acoustic reflex in hearing ? 4  
III. 5. a) Describe the origin, absorption, composition of the perilymph. 8  
b) Describe in detail innervation to the organ of corti. 8  
OR  
6. a) What is the role of supporting cells in the organ of corti ? 6  
b) Write a short notes on "blood supply" to the cochlea. 10  
IV. 7. a) Write a short note on summing potentials. 6  
b) Using a diagram explain the process of cochlear transduction. 10  
OR  
8. a) The cochlea is a non-linear transducer. Discuss. 10  
b) What are the differences between the cochlear microphonic and action potential. 6

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## MSCAD/AA040

- V. 9. a) How do sensory cells in the vestibular system differ from the sensory cells of the cochlea ? 8
- b) How improved knowledge of the anatomy of the cochlea influenced the development of theories; of hearing ? 8

OR

10. a) Critically evaluate the theories of hearing. 10
- b) Describe the innervation of the vestibular system . 6
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# MSCAD/AA 050

M.Sc. (Audiology) I Sem. Examination, Nov./Dec2004  
(Semester Scheme)

## Audiology Basics in Auditory Perception

Time:3Hours

Max. Marks: 80

*Instruction: Attempt all questions.*

- I. 1. a) Critically evaluate the theory of signal detection, 12  
b) Write a brief note on applicability of (Theory of Signal Detection) (TSD)  
for hearing assessment. 4
- OR
2. Write an essay on use of adaptive methods clinically in perception. 16
- II. 3. a) Discuss any two theories of loudness coding. 10  
b) There is no one to correspondence between loudness and hearing  
sensitivity. Discuss. 6
- OR
4. a) Compare and contract MAP & MAE 8  
b) Write a note on temporal integration and loudness perception. 8
- III. 5. a) Discuss the relevance of Psycho acoustical research for a proper  
understanding of audiology. 12  
b) Write a note on the phenomenon of beats. 4
- OR
6. a) Critically evaluate Medis and Hewitts model of pitch perception. 12  
b) Discuss briefly how Cochlea behave as series of the filters. 4.
- IV. 7) What are the factors which affect perception of gaps ? 16
- OR
- 8) Write an essay on timbre perception and object identification. 16
- V. 9) How do different acoustical parameters help in separating the sounds  
generated by musical instruments ? 16
- OR
- 10) Write an essay on general principles of perceptual organization. 16
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