

I Semester M.Sc. Examination, December 2006
(Semester Scheme)

Speech Language Pathology and Audiology
Research Methods in Speech Language and Hearing

Time : 3 Hours

Max. Marks : 80

*Instructions : 1) Answer all questions following instructions given.
2) See the marks given for each question.*

- I. 1) a) What do you understand by research ? Bring out the variables in speech and Hearing research. 8
b) Discuss the normative research in speech language pathology and Audiology with suitable illustrations. 8
- OR
- 2) What are the various methods of observation and measurement in speech language pathology and audiology ?. 16
- II. 3) What are the characteristics of a good research design? Illustrate with examples the single subject multiple baseline design. 16
- OR
- 4) Write the format and principles involved in communicating research findings in the field of speech language pathology and audiology ? 16
- III. 5) Critically evaluate any two studies in the treatment of stuttering that have used ABA & ABAB design. 16
- OR
- 6) Evaluate any two studies appeared in the standard journals in the field of Audiology that used Factorial Randomized Blocks Design. 16
- IV. 7) a) Highlight recent trends in research in the treatment of phonological disorders. 8
b) Critically analyse the major research contributions in understanding hearing disability in the past one decade.. 8

- 8) a) Discuss the major advancements in research methodology in hearing evaluation in the last 10 years. 8
- D b) Discuss research methods used in auditory training between 1980 - 2000. 8
- V. 9) Write an essay on various research methods used in clinical psychology in the treatment of stuttering. 16
- OR
- 10) Describe the epidemiological research studies in Audio logy. 16
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**I Semester M.Sc. (SLP)/M.Sc. (Aud.) Examination, December 2006
(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) Define probability. Explain the various approaches to the study of probability. 8

b) A puzzle is given to five students A, B, C, D and E. Their chance of solving it are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{6}$. What is the probability that the problem will be solved ? 4

c) Explain the meaning and applications of Bayes'theorem. 4

OR

2) a) Distinguish between point and interval estimation 6

b) Elaborate on the properties of normal distribution. 6

c) Distinguish between null hypothesis and alternative hypothesis with suitable examples.

II. 3) a) Differentiate between ANOVA and ANCOVA. 6

b) A school adopts 3 types of teaching methods on 4 separate groups of children with special needs. The scores secured after the teaching program are: 10

Methods/Students	A	B	C	D	Total
x	6	4	8	6	24
Y	7	6	6	9	28
Z	8	5	10	9	32
Total	21	15	24	24	84

Find out if the methods are different as also if they make any material difference in the final score.

OR

P.T.O.

- 4) a) Elucidate the general properties of normal distribution curves. 4
- b) State and explain the addition theorem of probability with suitable examples. 4
- c) Find the coefficient of correlation between X and Y series : 8

X 57 42 40 33 42 45 42 44 40 56 46 43

Y 10 60 30 41 29 27 27 19 18 19 31 29

- III. 5) a) State and explain the central limit theorem. 6
- b) Do the results of a survey given below suggest that the type of family has a bearing on the condition of a child by using chi-square test: 10

Condition of Child	Nuclear Family	Non Nuclear Family	Total
Introvert	76	43	119
Ambivert	38	17	55
Extrovert	25		72
Total	139	107	246

OR

6. a) Write notes on the various types of non-normal distributions. 6
- b) In a survey of 200 obstetric cases, the following data was compiled

Type of Labor	Average IQ	Sub-Average IQ	Total
Normal Labor	40	40	80
Difficult Labor	35	85	120
Total	75	125	200

Do these figures support the hypothesis that type of labor is linked with the IQ of the children. X^2 for 1 df at 5% is 3.84.

10

IV. 7) a) Explain the utility of various measures of association in the analysis of qualitative data ? 6

b) In two Child Guidance Centers -A and B, the following information was gathered by an investigator:

	CGC 'A'	CGC 'B'
Total population	240	234
MR cases	40	34
Non-MR cases with Problem Behaviors	40	20
MR cases with Problem Behavior	5	2

Compare the degree of association between mental retardation and problem behaviors in each of the two CGCs. 10

OR

8) a) Write short notes on **any two** of the following : (4X2=8)

- i) Coefficient of Association
- ii) Consistency of Data
- iii) Contingency Tables.

b) From the following two cases find out whether the data are consistent or not: 8

Case 1 : (A) = 100, (B) = 150, (AB) = 60, N = 500

Case 2 : (A) = 100, (B) = 150, (AB) = 140, N = 500

V. 9) a) Explain the salient features and applications of principal component analysis with suitable examples. 8

b) Write short notes on any **two** of the following : (4x2)

- i) Factor analysis
- ii) Multiple Regression
- iii) MANCOVA

OR

10) a) What is multivariate analysis ? Explain their salient features and applications in the field of speech and hearing. S

b) Write short notes on **any two** of the following : (4x2)

- i) Cluster Analysis
- ii) Logistic Regression
- iii) Mathematical Statistics Vs Biostatistics.

I Semester M.Sc. Examination, December 2006
(Semester Scheme)
MSc. (Aud.) and MSc. (SLP)
Technology for Speech-Language and Hearing

Time : 3 Hours

Max. Marks : 80

Instruction : Answer all questions.

1. a) With a functional block diagram, explain how will you do the networking of a speech therapist's computer with the computer of a child with a communication disorder ? 6
 - b) List out a few application softwares used for diagnosis of communication disorders. How does an application software differ from a computer language ? explain. 6
 - c) "In a personal computer, RAMs are preferred over hard disks for storage of current data". Justify this statement. 4
- OR
2. a) Illustrate the use of an LCD display in an immittance audiometer. Explain the working of an LCD display. 5
 - b) With supporting diagrams explain the structure and working of the following devices (a) UJT (b) Transistor. List out two applications for each of these devices related to the field of speech and hearing. 5
 - c) Explain how flip-flops are used to store bits. 5
3. a) Mention the applications of digital filters in speech analysis. Which type of digital filter is preferred for speech analysis ? Why ? 5
 - b) Mention how a D to A converter is used in a digital hearing aid. Explain the working of a D to A converter. 6,
 - c) Find out the ideal sampling frequency for A to D conversion of a typical speech signal. Justify your answer with supporting theorems. 5

OR

4. a) With a block schematic, explain how an audio signal can be modulated and demodulated in amplitude. 8
- b) Name the different types of digital modulation techniques. Explain any one technique in detail. Mention how this technique can be used in speech analysis. 8
5. a) With a neat sketch, explain the temporal and spectral nature of a click stimuli before and after transduction. 6
- b) Define the following with reference to acoustic stimuli. 6
 - a) Stimulus duration
 - b) Stimulus level
 - c) Stimulus frequency
 - d) Stimulus repetition rate
- c) "The spectrum of a tone burst stimulus before transduction depends on the gating function". Critically evaluate this statement. 4

OR

6. a) What are the factors to be considered while placing electrodes on the patient to perform an evoked response audiometry ? 4
- b) What is differential amplification ? How does it help in eliminating common mode noise ? 6
- c) What is artefact rejection ? How is it implemented in a BERA system ? 6
7. a) With a block diagram, explain the working of a voice response system. 8
- b) Name the different types of speaker verification systems. Explain each of them. 8

OR

8. a) Briefly explain the need for carrying out electroacoustic evaluation of hearing aids. 4
- b) With a block diagram, explain how a hearing aid evaluation system works. 8

- c) Define the following terms with reference to a hearing aid 4
 - i) Attack time
 - ii) Release time
 - iii) Compression threshold
 - iv) Compression ratio.
- 9. a) Name the different imaging techniques used in radio diagnosis. Comment on the merits and demerits of each. 5
- b) Explain how Doppler shift principle is used for blood flow studies. 5
- c) List out the problems faced in genetic analysis of speech and language disorders. Explain the multifactorial polygenic model. 6
- 10. a) With a functional block diagram, explain how an EEG signal is recorded. 6
- b) Explain the working principle of Magnetic Resonance Imaging. 6
- c) Write a short note on Electro Myo Graph. 4

AA 040

**I Semester M.Sc. Examination, December 2006 –
(Semester Scheme)**

**Audiology and Speech Language Pathology
Auditory Physiology**

Time : 3 Hours

Max Marks : 80

Instruction : Answer all question.

- I. 1) a) Write a note on comparative external ear anatomy across species. 6
b) Describe the auditory and non-auditory functions of external ear. 10
OR
- 2) How does the external auditory meatus help in audition ? Trace the development of the same from birth to old age. 16
- II. 3) a) Explain Eustachian Tube Physiology. 10
b) Describe the reciprocal action of round and oval windows. 6
OR
- 4) a) Write a note on the transformer action of the middle ear. 8
b) Write notes on non-acoustic reflex. 8
- III. 5) a) Draw a neat labelled figure of the end-organ of hearing and describe the nerve supply. 4+4
b) Write a note on cochlear fluids. 8
OR
- 6) a) What are the different methods used to study the cochlea ? 8
b) Describe the embryology of inner ear. 8

P.T.O.

- IV. 7) a) Comment on Bekesy's view of the mechanics of cochlea. 8
b) Briefly discuss the 'dancing hair cell' phenomenon. 8

OR

- 8) Write an essay on cochlear nonlinearity. 16

- V. 9) a) Why is the knowledge of vestibular physiology essential to an audiologist ? 8
b) Explain the vestibular ocular and vestibular special reflexes. 8

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- 10) Highlight the differences in the 2 basic theories of hearing. Do you feel a new theory is necessary, why ? 16

AA050

I Semester M,Sc. Examination, December 2006

(Semester Scheme)

Audiology & Speech Language Pathology

Basics in Auditory Perception

Time : 3 Hours

Max. Marks : 80

Instruction : Attempt **all** questions.

- I. 1) a) Describe briefly the psychophysical methods. 9
b) How can psychophysical methods be used for estimating hearing sensitivity in children? 7
- OR
- 2) a) Why a knowledge of theory of signal detection is necessary for a better understanding of audiology. 8
b) Describe the salient features of theory of signal detection. 8
- II. 3) What are the factors affecting pitch perception. 16
- OR
- 4) a) Write a note on consonance, dissonance and musical interval. 8
b) JND for frequency. 8
- III. 5) a) Write in detail a note on Weber's law and Loudness perception. 9
b) What are DL's ? Explain the procedure of measuring DL's. 7
- OR
- 6) a) Write a note on Steven's power law. 10
h. b) Factors which affect loudness of pure tones. 6
- IV. 7) Write an essay on timbre. 16
- OR
- 8) Design an experiment for studying gap detection. 16
- V. 9) Discuss the factors that underlie auditory object separation. 16
- OR
- 10) Write an essay on auditory streaming. 16