

SYLLABUS FOR PH.D ENTRANCE TEST IN SPEECH AND HEARING

1) ADVANCES IN SPEECH SCIENCE.

- a) Life span changes in speech mechanism including developmental milestones
- b) Physiology of Speech production: Respiratory System, Laryngeal System, Co-ordination of respiratory and laryngeal systems in phonation, Articulatory and Resonatory systems.
- c) Theories and models of speech production.
- d) Principles, instrumentation and measurement procedures.
- e) Speech Analysis and Synthesis – Techniques, limitations and applications.
- f) Analysis of infant cry.
- g) Recent trends in speech science measurement and application.

2) PHONOLOGICAL AND MOTOR SPEECH DISORDERS.

- a) Clinical phonology, theories of phonology, disorders of phonology in different clinical populations, recent developments in evaluation of phonology, treatment Practices
- b) MSD in Children - Neurophysiology and functional development of motor control, Primitive postural and oropharyngeal reflexes, associated and communication problems. Assessment and Intervention – Early communication development. Speech language therapy. Neuro developmental approaches.
- c) MSD in adults: Assessment Procedures, review of different types of dysarthria and apraxia, differential diagnosis, Prognostic issues and treatment procedures for the different types of dysarthrias.

3) VOICE AND LARYNGECTOMY.

- a) Neuroanatomy and Neurophysiology of larynx.
- b) Recent advances in measurement of voice and vocal fold function.
- c) Brief review of voice disorders in children and adults.

- d) Perceptual, acoustic, aerodynamic and physiological characteristics of pathological voices. Differential diagnosis of voice disorders.
- e) Recent advances in voice therapy and treatment outcomes.
- f) Professional voice users – Assessment and management.
- g) Review of current literature and research designs in voice disorders.
- h) Types and characteristics of laryngectomy surgery.
- i) Management of laryngectomy-Esophageal speech, tracheo esophageal speech, artificial larynx, pharyngeal and buccal speech.

4) FLUENCY AND ITS DISORDERS.

- a) Neurophysiological and neuropsychological bases of normal fluency and stuttering.
- b) Different perspectives of stuttering.
- c) Theoretical issues in measurement of stuttering. Treatment outcomes in stuttering. Relapse, Prognosis and maintenance.
- d) Recent advances in management of stuttering.
- e) Neurogenic Stuttering
- f) Cluttering – relationship between cluttering and stuttering. Treatment of cluttering.
- g) Review of current literature and research designs in fluency disorders.

5) CHILDHOOD LANGUAGE DISORDERS AND ADULT LANGUAGE DISORDERS.

- a) Language development in exceptional circumstances: extreme deprivation, bilingual language exposure, twins, visual handicap, Williams syndrome (disassociation between language and cognitive functions), Hearing loss, Dyspraxia, Learning disabilities, Dysphasia, Acquired childhood aphasia.
- b) Assessment and management of developmental language disorders. Specific assessment and intervention approaches.

- c) Counseling, – principles of counseling – types of counseling – individual, group and family, parental, vocational, educational, and rehabilitative – behavioral counseling in the context of speech, language disorders.
- d) Assessment and Diagnosis in Neuro language disorders. Advances in aphasia rehabilitation, Assessment of treatment efficacy in aphasia. Right hemisphere brain damage, Dementia, Traumatic Brain Injuries, Primary Progressive aphasia, Sub-cortical aphasias and Schizophasia. Alternative and Augmentative Communication for the language disordered.

6) **AUDITORY PHYSIOLOGY**

- a) Anatomy and physiology of ear: External ear, Middle ear, Inner ear
- b) Anatomy and physiology of Afferent Auditory Pathway : Auditory nerve, Central auditory pathways, Auditory cortex
- c) Theories of hearing
- d) Anatomy and physiology Efferent pathways
- e) Vestibular system - anatomy & physiology

7) **PSYCHOPHYSICS OF AUDITION**

- a) Psychoacoustics – review
- b) Theory of signal detection
- c) Loudness
- d) Pitch
- e) Differential sensitivity for frequency and intensity and time
- f) Perception of quality/timbre and complex tones
- g) Masking and critical band concept
- h) Adaptation
- i) Temporal perception
- j) Binaural hearing

8) **SPEECH PERCEPTION AND ITS DISORDERS**

- a) Introduction to speech perception, Acoustics of speech in relation to production.
Coding of speech in the auditory pathway.
- b) Theories of speech perception
- c) Methods used to study speech perception
- d) A) Perception of vowels and consonants in infants and adults
B) Effects of co-articulation on speech perception
- e) Perception of speech through the visual and tactile modes and through cochlear implants
- f) Dichotic listening
- g) Memory and speech perception
- h) Speech intelligibility
- i) Perception of speech in the hard of hearing
- j) Information processing skills
- k) Word recognition, Sentence comprehension, Processing of phonological morphological, syntactic, semantic and pragmatic aspects of language

9) **DIAGNOSTIC AUDIOLOGY:**

- a) Hearing screening: cost benefit analysis, sensitivity vs specificity, efforts of who and govt of india, genetic counseling, public awareness programs
- b) Oaes and immittance
- c) Classification, generators and general principle in recording of auditory evoked potentials
- d) Factors affecting recording and interpretation of early responses, middle latency response, long latency response, endogenous potentials
- e) ASSR: introduction , factors affecting recording and interpretation of steady state evoked responses
- f) Correlation of audiological finding to histopathological findings in conductive hearing loss, genetic hearing loss, cochlear pathology and retro-cochlear pathology

- g) Assessment of auditory disorders in the special population such as deaf-blind, MR, autism, cerebral palsy, patients with hyperacusis
- h) Non audiological tests, x – rays, pet, mri, ct scan, other tests, lab tests for differential of auditory disorders.
- i) Assessment of auditory processing disorders.
- j) Evaluation of patients with vestibular problems.

10) REHABILITATIVE AUDIOLOGY:

- a) Fundamentals of digital signal processing and communication system
- b) Advances in technology of hearing aids
- c) Evaluation of hearing aids
- d) Selection of special features in hearing aids with reference to specific clients
- e) Tinnitus maskers and their utility
- f) Aids
- g) Cochlear implants, middle ear implants and brainstem implants, and Bone anchored hearing aids (BAHA)
- h) Educational Audiology
- i) Special needs for rehabilitation of Children and Geriatrics.
- j) Tinnitus management
- k) Hair cell regeneration, gene therapy for hearing loss
- l) Management of CAPD cases: Choice of management based on audiological test results, Environmental modifications, Devices, Auditory perceptual training, Communications strategies, Cognitive \ language management, Measuring outcomes
- m) Sign language methods and types, Rehabilitative assessment of persons with hearing impairment, Hearing inventories, scales etc.,