

BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE, INDIA
PhD Entrance Test – 2020
SECTION-II: Audiology- 50 Marks

PSYCHOPHYSICS:

- Theory of signal detection,
- Concept and application including ROC;
- Methods of measurement in psychophysics: classical & adaptive ;
- Loudness perception, Masking and Critical band concept;
- Temporal perception; Adaptation; Pitch Perception;
- Binaural hearing; MLD;
- Monaural localization; Time intensity trade

AUDITORY PHYSIOLOGY:

- Anatomy & Physiology of external and middle ear; Nonlinearities of middle ear;
- Macro & Microanatomy of cochlea, Cochlear fluids; Cochlear models, Modes of bone conduction; Cochlear mechanics; Cochlear transduction; Cochlear electrophysiology; Cochlear non-linearity; Proteins in the cochlea; Theories of hearing
- Structure and contents of internal auditory meatus; Refractory period, adaptation, firing rates, types of responses; Electrophysiology – action potential, generation and properties ; Stimulus coding in auditory nerve; Neurotransmitters- afferent & efferent
- Anatomy and physiology of vestibular structures and vestibular nerve, Vestibular reflexes
- Anatomy of CN, SOC, LL,IC,MGB ; Tonotopic organization in auditory brainstem; Neurophysiology at different levels of auditory brainstem; Localization, Stimulus coding, neurotransmitters
- Anatomy and tonotopic organization of primary and secondary auditory areas in auditory cortex and efferent pathways, neurotransmitters; Neurophysiology of auditory areas; Stimulus coding – frequency, intensity and time; Plasticity in auditory system
- Anatomy & physiology efferent auditory system

SPEECH PERCEPTION IN NORMAL HEARING AND THOSE WITH HEARING IMPAIRMENT:

- Theories and models of speech perception ; Basic Issues in speech Perception; Speech processing in the auditory system. Overview of the anatomy of the auditory system, peripheral and central mechanisms in the analysis of speech – place representation, intensity model, multistage representation and categorical perception
- Speech intelligibility and perception of supra-segmentals: Methods: Subjective (perceptual tests), Objective (Articulation Index, Speech intelligibility index. Speech transmission index),
- Perception of segmental and supra-segmental cues through- the visual modality, and tactile modality ; Perception of vowels, semivowels, and diphthongs in individuals with hearing impairment; Perception of consonants in individuals with a hearing impairment
- Speech perception through hearing aids using signal enhancing features; Dichotic listening- Theories, Factor affecting, Clinical application
- Infant Perception, perception of consonants and vowels, suprasegmentals in infants, comparison of adult and infant perception, universality in perception, word perception, lexical neighbourhood.
- Perception of segmental and suprasegmental cues through cochlear implants; auditory brainstem implants; Middle ear implant and BAHA

- Speech perception in noise; effect of reverberation on speech perception; Combined effect of noise and reverberation; Effect of non-native accent on speech perception
- Short term memory and speech perception, stages of memory, theories, perception of consonants and vowels in short term memory, animal perception, consonant and vowel perception.

DIAGNOSTIC AUDIOLOGY:

- Physiological evaluation of the auditory system: OAE, immittance, auditory evoked potentials;
- Pathophysiological and audiological findings in different pathologies related to External and middle ear disorders, Inner ear disorders, Auditory nerve and brainstem: Space occupying lesions, Auditory neuropathy/dysynchrony, Demyelinating disease
- Pathophysiology of Vestibular disorders; Audio vestibular evaluation.
- Assessment of (C)APD
- Tests to evaluate tinnitus and hyperacusis
- Nonaudiological tests in diagnosis of auditory disorders
- Auditory disorders in those with multiple problems
- Hearing screening

HEARING DEVICES

- Advances in Technology of hearing aids:
- Evaluation of hearing aids : Electro acoustic characteristics of hearing aids, National and international standards,
- Hearing aid selection and fitting: Subjective and Objective measures: Assessment and Evaluation, Selection, Verification, Validation
- Selection of special features in hearing aids with reference to specific clients
- Tinnitus maskers and their utility
- Cochlear implant: Description, types, designs and features, Speech processing strategies, Assessment strategies, Post operative management, Outcome measurement
- ALDs- Types: Auditory based, Visual based and Tactile based ALDs
- Middle ear implant, BAHA, Brainstem implant

ADVANCES IN THE MANAGEMENT OF PERSONS WITH HEARING DISORDERS

- Habilitation of infants and children with hearing impairment
- Process of informed decisions regarding: selection of method of rehabilitation, choice of amplification, language issue, selection of educational options
- Alternate modes of intervention: CBR, correspondence programs, distance mode intervention, telepractices
- Outcome measures
- Formal education: Pre-school, School, College and vocational training programs
- Management of special groups in respect to amplification / implantable devices, placements and role of caregivers
- Management of children and adults with multiple handicap
- Management of children, adults, and geriatrics in respect to amplification/implantable devices, role of caregivers
- Management of those with mild-to-moderate hearing loss, unilateral hearing loss; Sudden hearing loss, progressive hearing loss, fluctuating hearing loss

- Psychosocial measures, Assertiveness training
- Communication strategies
- Management of persons with tinnitus: Neurophysiological model; Techniques of management & Counselling
- Management of persons with hyperacusis:, Neurophysiological model, Techniques of management & Counselling
- Management of persons with (C)APD: Choice of management based on audiological test results, Environmental modifications, Devices. Auditory perceptual training. Communications strategies, Cognitive\language management.
- Legislations related to education issues of persons with hearing impairment
- International and National acts / policies / schemes