

FORENSIC SCIENCE LABORATORIES

POLICE DEPARTMENT

Madivala, Bangalore

SYLLABUS FOR THE POST OF EEG TECHNICIAN

(FORENSIC PSYCHOLOGY SECTION)

Paper I: General Paper

- General awareness, Current affairs, Qualitative & Quantitative and general basic questions about all the subjects related to Physics, Chemistry, Biology, Electronics and Computer Science.

Paper II: Subject Paper

- Definition, types and functions organization of human body, brief structure and functions of respiratory system, cardiovascular system, nervous system, endocrinal system.
- Neuroscience: Anatomy of the brain – Human brain and structures, Neurons, structure, communications, synapses, neural transmission, neurotransmitters, divisions of brain, neuro-structures - cerebellum, cerebrum, mid brain, pons, medulla oblongata, spinal cord, spinal nerves, cranial nerves, CNS and PNS- action potential.
- Brain signal processing Electroencephalogram – relationship between neuronal activity and EEG, cortical sources of the scalp EEG signals, acquisition of EEG, Artifacts of EEG, Pre-processing- Filtering, Principles component of analysis, different frequency bands of EEG, Event Related brain potentials (ERP) normal EEG, Awake EEG, Sleep EEG, Eye movements, Abnormal EEG records, EEG in neurological disorder, Standards for performing clinical EEG, EEG activation. Different parts of EEG machine and its functions, i.e. Montage, Electrodes, filter, transformers, Ac and Dc, power factor, RMS, average and maximum value of Ac, calibration, sphenoidal electrodes, depth electrodes, electroencephalographic monitoring, video electroencephalography, quantitative electroencephalography, brain mapping and others. Pharmacology and drug effects.
- Electroencephalography reporting, spectral decomposition, features identification of time frequency analysis - Fourier, wavelet, Hilbert transformation and spectral estimation, pattern classification by linear discriminants, support vector machine (SVM) and artificial neural networks (ANN) (MATLAB) coding assignments, familiarization with EEG lab. Functional Magnetic Resonance Imaging (fMRI) - hemodynamic activity of brain – T1, T2 weighted images 3D reconstruction MRI image and functional sequencing over time fMRI acquisition, Pre-processing, artifacts removal, inferencing Blood Oxygen Level Dependent (BOLD) patterns of activation, application to clinical and forensic sciences.