Post – Technical Assistant (Bio Medical Engineering)

SYLLABUS

PART – A (20 MARKS)

General Knowledge and Current Affairs A standard pattern similar to one used by Staff Selection Commission for Combined higher secondary level examination or banking clerical examination can be conducted. Current Affairs questions can also be included in this.

General English: Error recognition, Fill in the blanks with appropriate terms, Vocabulary, Grammar with special reference to Sentence Structure, Synonyms, Antonyms etc

General Aptitude & Reasoning: Questions on reasoning and problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc.

Mathematics: Class 10th Syllabus of NCERT.

Science, Computer application and Other Subjects: Knowledge level to test supervisory skills will also be included. Class 10th Syllabus of NCERT.

PART – B (80 MARKS)

Network Analysis Theorems, semiconductor devices (diode, transistor, FET etc.) Biomedical Instrumentation – Operational amplifier and its applications, Design of Amplifiers, filters etc. Signals and Systems – Periodic, Aperiodic, linear, nonlinear, Causal non causal systems, FFT, Fourier transform, Laplace transform, Z-transform, DFT and DTFT, Filter Design – Butter worth, Chebyshev, Finite word length effects – Quantization effects, Truncation Analog electronics and microelectronics. Digital Electronics – Logic Gates, Multiplexer, Demultiplexer, Shift registers, flipflops Microprocessor – 8085, Microcontroller – 8051.

Biosensors and transducers – pressure sensors, temperature sensors, LVDT, strain/displacement sensor, measurement and Instrumentation, calibration, accuracy, errors, sensitivity, specificity, Biochemistry, Autoanalyzer's. Biosignals -ECG, EEG, EMG, EEG (origin, acquisition, and processing). Medical Imaging – Principle of X-ray, CT, MRI, Ultrasound, MRI. Biomaterials – Metals, ceramics, polymers, composites, Tissue Reaction

Biomedical Equipment's – Defibrillator, Pacemaker, Ventilator, Dialysis unit. Basic Clinical Science – Orthopedic fracture management, external fixator devices. Artificial Organs -Artificial skin, artificial blood, cochlear implants, artificial lungs, artificial heart. Biomechanics – fluid mechanics, Lubrication in joints, solid mechanics, sports biomechanics, Joint mechanics, soft tissue mechanics, Biofluid dynamics, Muscle mechanics, bioTribology, Rehabilitation. Mechatronics – Additive manufacturing, 3D printing, robotics, manufacturing technology, composites, thermodynamics, Fracture Mechanics, CAD CAM