



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai - 400076**

**Revised Technical Specifications for Gas Chromatograph-Mass Spectrometer (GC-MS)
RFx No. 610000763 (Reference No. 100017930)**

Gas Chromatograph coupled with Single quadrupole with following specifications.

Sl. No	Requirement	Specification
1	GC	Microprocessor based Fast GC with EPC/ PPC/AFC, and able to support at least 2 inlets, at least 2 detectors. GC must have a touchscreen display with Graphical User Interface (GUI) Should be capable of detecting syringe-injected gas samples including H ₂ , O ₂ , CO ₂ , CO
2	Column Oven	<ul style="list-style-type: none"> • Minimum two suitable capillary columns • Temp. Range: Ambient +4 to 450°C • Ramp rate: maximum 110°C/min or more • Cooling rate: 450°C to 50°C within 10 min or better with optional cooling ramps • Should have oven power safety (power off when door is open)
3	Split/Splitless injector port – 1 Nos	<ul style="list-style-type: none"> • Split/split less capillary inlet • Maximum temperature: 400 °C or better • Split ratio: 6000:1 or more • Pressure setting range 0–90 psi or better with control of 0.001psi for whole range • Carrier gas Flow Control should have Constant flow, constant pressure • Pressure program ramps: minimum 3 steps
4	Inlet No 2	<ul style="list-style-type: none"> • EPC compensated for atmospheric pressure and temperature variation • Packed purged injection port (PPIP) • Electronic flow/pressure control: 0 to at least 90 psig pressure range, 0.0 to 150.0 mL/min flow range. • Ranges are chosen to provide optimum performance over normal packed column setpoint ranges. • Electronic septum purge flow control • 400 °C maximum operating temperature
5	Thermal conductivity	<ul style="list-style-type: none"> • Minimum detectable level: 300 pg tridecane/mL with He carrier (Linear dynamic range: >100 ±5 %) • Unique fluidic switching design provides rapid stabilization

	detector (TCD)	<p>from turn-on, low-drift performance.</p> <ul style="list-style-type: none"> • Signal polarity can be run-programmed for components having higher thermal conductivity than the carrier gas. • Maximum temperature: 400 °C • Standard EPC for two gases • Make-up gas: 0 to at least 10 mL/min • Reference gas: 0 to at least 90 mL/min
6	Injector	<ul style="list-style-type: none"> • Automatic injector: Automated liquid sampler with 8 Vials or better capacity • Gaseous sample injector: Manual gas injector system (0.1-2.0 mL or better range for sample injection) should be available.
7	Single Quadruple Mass Spectrometer	<ul style="list-style-type: none"> • Ionization modes: EI & Chemical Ionization System should have dual filament design with automatic switching. • Ion Source temperature: up to 350°C • The ion source should include self-cleaning feature to remove matrix deposits (from the Ion Source) without the removing the ion source • Electron energy range up to 150 eV or better • Mass Range: 1.6 to 1000 amu or better. • Mass analyzer: Quadruple should be of solid metal/quartz, with pre-rods/heating for matrix elimination or cleaning or equivalent. • Vacuum pump: Dual inlet/stage Turbomolecular pump (>250 L/s) Ionization or a single inlet/stage Turbomolecular pump (>300 L/s) ionization • Mass axis stability: ± 0.1 amu over 48 hours • Mass resolution: Unit mass • Detector: Sealed long-life electron multiplier tube • Scan rate: >18,000 amu/s or better and should provide sensitivity for all mass range • Detection Limit: EI/CI MSD S/N Ratio : 1,500:1 with 1 pg/μL OFN, 300:1 or better (CI) for 1 pg/μL OFN • CI mode: System should include Chemical Ionization mode for molecular confirmation of compounds.
8	Database and software	<ul style="list-style-type: none"> • NIST 2020 library with license, Library data base in CD ROM should be provided
9	Gas Cylinders	<ul style="list-style-type: none"> • Filled gas, regulators, gas purification panel, tubing for Nitrogen and Helium gases.
10	Reagent Gas for CI mode	<ul style="list-style-type: none"> • Methane/Isobutane gas cylinder (Purity 99.995%) with required Accessories to be quoted. (Mandatory or included other alternative technique)

11	UPS	<ul style="list-style-type: none"> • Appropriate UPS with at least 60 minutes back up
12	Warranty	<ul style="list-style-type: none"> • 3 years for quoted GCSQ and TCD systems
13	PC & Printer requirements for GCMS	<ul style="list-style-type: none"> • CPU: Intel Core i5 – 3.20GHz or Higher • RAM : 8GB or Higher • Hard Disk : 500GB or Higher • Operating System: Windows 10 Professional 64 bit (Software should be License version) • Monitor: 21'' wide (minimum) color LCD, No. of pixels 1680*1050 • USB Ports: 5 ports of version 2.0 • Laser Printer A4 or Larger • MS office: MS Office 2010 or 2013 or 2016 and version of Microsoft Excel (32 bit) • Adobe Acrobat • Internet Explorer.