Specifications for the Characterization Equipment for Nanofluids under AICTE-RPS Project for the Department Mechanical Engineering:

Specifications for the Characterization Equipment for Nanofluids being procured under AICTE-RPS Project for the Department Mechanical Engineering are presented here. The tender notification is placed in the Buisinessline newspaper on 09-01-19. The bid documents for the same are to be procured from the Department of Mechanical Engineering for Rs.1000/-, by DD taken in the favour of the principal (RIFD/RPS/PROJECT), JNTUHCEH.

Sl.No	Name of the Instrument	Specifications
1	**Thermal Property Analyzer:** To measure the thermal conductivity of the liquids (Water / Oil, Nano fluids) and solids	**Range of the parameters:** Thermal conductivity (K): 0.02 to 4 W/mc Diffusivity (D): 0.1 to 1.0 mm^2 /sec Resistivity (R): 0.25 to 50 mc/W Specific Heat (C): 0.5 to 4 MJ/m^3 c Accuracy: +-5% The range of operating temperature need to be mentioned, based on which the equipment will be selected **Probes needed:** Thermal conductivity / Resistivity Probe (for liquids) Thermal conductivity / Resistivity Probe (for solids) Dual needle Thermal diffusivity / Specific heat sensor (for solids) The equipment need to be supplied along with the User Manual, Carrying hard case, Performance verification standards, Verification sensor Jigs, Thermal Grease, Drill bit for drilling holes on solid samples The setup need to be supplied with USB connectivity, Data Storage with Flash Memory The measurement procedure should be in Compliance to ASTM Standard D5334-08 and IEEE Standard 442-1981
2	**Viscometer:** To measure the absolute viscosity of the liquids (Water / Oil, Nano fluids)	**Range of the parameters:** Viscosity range: 0.2 to 3K cP (mPa.s) Sample volume: 0.5 – 2.0 ml, Accuracy: +-1.0% range Temperature range;1 Deg C to100 Deg C Repeatability: +-0.2% Speed: 0.1 – 200 RPM Speed Increments: Minimum 200 The set up need to consist of Viscometer, Lab stand, Spindle guard leg, Spindle set, Spindle 1-4 along with Software along with USB PC interface, RTD Temperature Probe, Instruction Manual, Carrying Hard Case and with calibration kit for Standards

3	**Probe Sonicator:**	Ultrasonic Power: 250 watts Frequency: 20 +- 3 KHz Capacity: up to 250 ml Titanium Horn with 3mm, 6mm and 12 mm diameter Temperature Range: 0 – 100Deg C Micro processor controlled and programmable, along with Temperature indicator and controller, Variable power output control Output amplitude: 1 -100% adjustable Overload protection Power supply: 230 V AC / 50 Hz
4	**Temperature conditioning bath:** To maintain and circulate the fluid (water) as per the required temperature for the Thermal conductivity set up and for the viscosity measurement set up	Temperature: 25 Deg C to 100 Deg C, +- 3 Deg C, Cooling Capacity: 320 watts @ 19 Deg C, (variable) Heating capacity: 2000 watts (variable), Bath size: 110 x 110 x 150 mm Flow rate 10- 15 liters /minute (variable)
5	**Mechanical Stirrer**	Motor:0.25HP to 1/2 HP Volume: 10 Ltrs to 20 Ltrs Speed: 200 to 2000 RPM with variable speed controller Digital speed indicator, Safety cut off for Motor against Over load
6	**Table with Anti vibration pads**	Size: 600mmL x 600mm W x 750mmH. Outer casing made of 18G thick C.R.C.A. Sheets and finished with epoxy powder coating. Inner frame: M.S. square tube 40mmx40mmx2mm. Shock absorbing arrangement by RCC slab and Rubber padding.& Black Granite Completely enclosed unit with window and provision for running of wires in and out of enclosure
7	**PH Meter with electrical conductivity**	To measure the pH, conductivity and Ion content of water and light oil base fluids and also for the Nano fluids