Sr.No.	Budget Head
1	CROSS FLOW HEAT EXCHANGER (CAR RADIATOR) WITH SPORT FRAME AND WITH VARIOUS DIFFERENT TYPES OF NECESSRY FITTINGS SUCH AS HEATING SYTEM, TEMPERATURE CONTROLLER/THERMOSTAT, ELECTRIC CONNECTIONS, TEMPERATURE DISPLAY, SELECTOR SWITCH, ROTOMETER, PID CONTROLLER, RTDS WITH DISPLAY UNITS, PRESSURE SENSORS, FLOW REGULATING PUMP, SONICATOR, WEIGHING BALANCE AND DATA LOGGER WITH SUITABLE PC/LAPTOP AND OTHER STABLE ACCESSORIES RELATED TO THE PROJECT CONSUMABLES NANOPOWDERS(TiO_2, Ag), EG AND SURFACTANTS ADDITIVES AND OTHER RELATED CONSUMABLES USED TO PREPARE NANOFLUID AND NANO-COOLANTS
2.	CONTINGENCY
	Total

General requirement:

Radiator Type Heat Exchanger (Cross flow heat exchanger) is required to study the performance of an automobile radiator type heat exchanger. Present set-up is to be provided with one automobile radiator and flexibility of installing any other radiator is also to be provided so that different type of radiator can be tested by the end user. A stirred tank with PID temperature controller is to be provided to circulate the coolant through the set-up. A variable speed pump with flow sensor is provided to circulate desired flow of coolant. For cooling, a variable speed fan with air duct also accompanies the set-up with anemometer to measure the air velocity. The present set-up should have the data logging facility. System must have provision to collect the output from the temperature sensors, pressure sensors, flow sensors and anemometer etc in suitable PC/laptop.

Specification:

Heat Exchanger	Automobile Radiator Type Heat Exchanger. (TATA/MARUTI Car-minimum 1000 cc engine)
Cooling Fan	Cooling fan with variable speed
Anemometer	To measure velocity of air in the duct
Coolant Storage Tank	Coolant Storage Tank Made of SS, capacity 15 Ltrs. fitted with fixed speed stirrer.
Heater	Nichrome immersion heater, capacity 4-6 kW.
Temperature Control	PID Controller for controlling temperature of coolant. PID temperature range-ambient to 150°C
Pressure Sensors	Stain gauge type Pressure sensors. Minimum four numbers at inlet and outlet of the radiator.
Temperature Sensors	RTD PT-100/K-Type temperature sensors. Minimum six numbers at appropriate positions.
Flow sensor	Differential Pressure Type. Range 5-20 LPM (app.).
Coolant Pump	Variable speed. Flow Range 5-20 LPM (app.).
Interfacing	Interfacing unit with control panel is to provide to condition all signal
Scientific Weighing Balance	Measuring Capacity 100g with high precision balance (0.001g)
Ultrasonicator Bath	Capacity: 8-10 litres with digital timer