#### Annexure-I

### Tender Form (Technical Bid) format

(To be submitted by the tenderer on their letter head.

To ----- Ref:-\_\_\_\_\_ Dt-

Tender Notice No and Date	Name of Work:"
The date and time of opening of tender:	at

A.G	A. General Details of the Bidder:					
SI.	Particulars	Remarks/Documents to be attached				
No.						
01.	Name of the Organization:					
02.	Address of Head Office: Telephone No: E-mail: Fax number (if any) Name(s) of the contact person(s):					
03.	CompanyStatus:Proprietor / Partner / Pvt. Ltd.CompanyEnclose Details					
04.	Turnover of the Agency for the last three years: Annualized average financial turnover equivalent to Indian Rupees during last three financial years	Year INR (in Lakh) 2020-21 - 2021-22 - 2022-23				
05.	Indian Income Tax Return Acknowledgement	Financial Year- 2020-21 Financial Year- 2021-22 Financial Year- 2022-23				
06.	Income Tax-PAN No.					
07.	VAT Tax Payer Identification Number (TIN)					
08.	Constitution of Firm (Proprietor / Partnership / Company/ Society)	Company Incorporation Certificate				
09	VAT Clearance Copy: Service Tax Registration					

### Format for Qualifying Details of Technical Bid

### Annexure-II

### DECLARATION

I	hereby declare	that the documents su	bmitted /
enclosed are true and corr	rect. In case any document at ar	ny stage found fake /	incorrect,
action as deemed fit by th	ne	can be taken agains	t me. Also,
we hereby accept all the Te	erms & Conditions of the Tender	will abide by it.	
A Processing Fee / EMD	O demand draft bearing No		dated
drawn on	is enclosed with Technical bid.		

Signature. Name Address: Mobile:

Date: -

### Annexure-III

#### **ACCEPTANCE OF THE TENDERERS**

All the clauses of tender document and Terms and Conditions as detailed in the Tender Document have been read/understood by me/us are acceptable to me/us. Me/We confirm that we will abide by these terms & conditions.

Dated: -

Signature

(Name in Block letters)

Name of Tenderer

Address \_\_\_\_\_ Address with stamp

\_\_\_\_\_

#### UNDERTAKING

То

The Director, IGIT Sarang, ODISHA

Sir,

- 1. I / we the under signed, certify that I/we have gone through the terms and conditions mentioned in the tender documents and undertake to comply with them.
- 2. It is further certified that our firm has not been blacklisted by any agency in India or abroad.
- 3. Neither I/we have any relatives present in the procurement committee nor I/we are biased by any committee member.

Dated:

SIGNATURE OF THE TENDERER WITH SEAL

NAME OF THE TENDERER WITH ADDRESS

# **TECHNICAL BID**

## (Should be submitted in a sealed envelope separately)

Sl. No.	Item with specification	Qty Required	Brand and Model no.	Manuals provided (YES/ NO)	Warranty 03 years (Yes / No)
I.	FF Lab.			(125,1(0)	(1007110)
1	Venturi Meter	01			
	• Body Material : Acrylic,				
	compatible to 1" Dia.				
	Pipe.				
	• Water Circulation : <sup>1</sup> / <sub>2</sub> HP				
	Pump,				
	Crompton/Standard make.				
	• Flow Measurement: Using				
	Measuring Tank with				
	piezometer Capacity 25				
	Ltrs. : Capacity 50 Ltrs.				
	• Stop Watch: Electronic				
	• Pressure measurement: By				
	Pressurized differential				
	pressure manometer	01			
2	Venturi meter Dedu Meterial	01			
	A anylia compatible to 1" Dia				
	Pipe				
	Orifice meter: Body Material				
	Acrylic compatible to 1" Dia				
	Pipe Orifice plate made of				
	Stainless Steel.				
	Water Circulation: <sup>1</sup> / <sub>2</sub> HP Pump.				
	Crompton/Standard make.				
	Pressure measurement: Using				
	Measuring Tank with piezometer				
	Capacity 25 Ltrs.				
	Sump Tank: Capacity 50 Ltrs.				
	Stop Watch: Electronic				
	Flow Measurement: By				
	Pressurized differential pressure				
	manometer				
	• Control Panel Comprises of:				
	Standard make On/OII Switch,				
3	Ditot Tubo	01			
5	Pitot Tube: Material Copper of	01			
	compatible size fitted with venire				
	scale				
	Test Section: Material Clear				
	Acrylic, compatible to 1" Dia.				
	Pipe				
	Water Circulation: <sup>1</sup> / <sub>2</sub> HP Pump.				
	Crompton/Standard make.				

	Flow Measurement: Using			
	Measuring Tank with Piezometer			
	(Capacity 25 Ltrs.)			
	Sump Tank: Capacity 50 Ltrs.:			
	Stop Watch: Electronic			
	Pressure measurement: By			
	differential pressure manometer			
4	Variable Speed Reciprocating	01		
-	Pumn	01		
	Pump: Double acting Single			
	Culinder Conscity 1 HP			
	• Speed 250 DDM (max) Head 5			
	ka/am2 (max.)			
	Kg/clil2 (lilax.)			
	Driver 1 UD DC motor			
	Drive: I HP DC motor.			
	Speed Control: Inyristor			
	controlled.			
	Sump Tank: Capacity 50 Ltrs.			
	approx.			
	Measuring Tank: Capacity 25			
	Ltrs. approx. with Piezometer.			
	Stop Watch: Electronic.			
	Pressure Gauge: Bourdon type.			
5	Variable Speed Contrifugal	01		
5	Variable Speed Centrifugal	01		
5	Variable Speed Centrifugal Pump Rump: Kirloskar Maka Capacity	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.)	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Madium Flowy Clear Water	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor.	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Taple: Capacity 110 L tra	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs.	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tanky Capacity 70	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piacometer.	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Step Wetch, Electropic	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Prassura Cauga: Pourdan tuna	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type.	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type. • Control Panel Comprises of :	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type. • Control Panel Comprises of : Energy measurement	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type. • Control Panel Comprises of : Energy measurement : Electronic Energy meter, L&T	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type. • Control Panel Comprises of : Energy measurement : Electronic Energy meter, L&T make.	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type. • Control Panel Comprises of : Energy measurement : Electronic Energy meter, L&T make. RPM measurement	01		
5	Variable Speed Centrifugal Pump Pump: Kirloskar Make, Capacity 1 HP. Speed 2800 RPM (max.), Head 12 m (max.) • Medium Flow: Clear Water. Drive: 1 HP DC motor. Speed Control: Thyristor controlled. Sump Tank: Capacity 110 Ltrs. approx. • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer. • Stop Watch: Electronic. Pressure Gauge: Bourdon type. • Control Panel Comprises of : Energy measurement : Electronic Energy meter, L&T make. RPM measurement : Digital RPM Indicator with	01		

S1.	Item with specification	Qty	Brand and Model no.	Manuals	Warranty
No.		Required		provided	03 years
				(YES/NO)	(Yes / No)
	. MO Lab.				
1	Ball Mill	01			
	Ball Mill: Material SS, Dia.				
	100m, Length 150mm. Thickness				
	2.5 mm (approx.)				
	Feed Size: 2 mm (approx.)				
	Product Size: 200 mesh (approx.)				
	Drive: FHP motor, variable speed				
	coupled to Reduction Gearbox.				
	Product receiver: Material				
	Stainless Steel of suitable size.				
	Control Panel Comprises of:				
	RPM measurement				
	RPM measurement: By proximity				
	sensor with Digital indicator				
	Energy measurement: Electronic				
	Energy meter				
	RPM meter: Digital RPM				
	Indicator, Non-Contact type with				
	Proximity sensor.				
2	Jaw Crusher	01			
	Jaw: Size 100 x 150mm.				
	Feed Hopper: Suitable capacity.				
	Feed Size: 50mm (approx.)				
	• Product Discharge Size: (5-15)				
	mm (approx.)				
	• Drive: Electric motor, 3 HP,				
	Single phase,				
	• Control Panel Comprises of:				
	Energy measurement: Electronic				
	Storter 2 UD Single Dhose				
	MCP: For over load protection				
3	Single dock vibrating screen	01			
5	Vibrating Screen (3 Nos.): Width	01			
	380mm Length 600mm				
	Mesh: Size - 6 3mm (Approx)				
	Drive: Eccentric shaft coupled to				
	motor				
	Feed Hopper: Compatible				
	Capacity with arrangement to				
	control feed.				
	Collecting bins: 2 Nos. of suitable				
	capacity.				

4	Disc pelletizer	01		
	Diameter: 1 m, 12 mm width with			
	fitted motor for variable RPM			
	setting, Variable angle of disc			
	inclination, with 10-15 kg of			
	sample processing capacity etc.,			

Sl. No.	Item with specification	Qty Required	Brand and Model no.	Manuals provided	Warranty 03 years
T				(YES/NO)	(Yes/NO)
1		01			
1	Solid-Liquid extraction in	01			
	Packed bed type				
	Extraction Column: Material				
	Borosilicate Glass. Dia 80 mm,				
	Height 500 mm (approx.)				
	• Solvent Flow Measurement: By				
	Rotameter.				
	Solvent Tank: Made of Stainless				
	Steel, Capacity 30 Ltrs. Double				
	walled.				
	Solvent circulation: By Magnetic				
	Pump made of Polypropylene for				
	solvent. Maximum working				
	temperature 60°C.				
	• Heater: Nichrome wire heater.				
	Receiving Tank: Material				
	Stainless Steel, Compatible				
	capacity with sieve				
	• Temperature Sensor: RTD PT-				
	100 Type.				
	Digital Temp. Controller				
	: PID Controller, 0-199.9°C				
	(For Feed Tank)				
2	Liquid-Liquid Extraction in	01			
	packed tower				
	Extraction Column: Material				
	Borosilicate Glass, Dia 55 mm,				
	Height 750 mm (approx).				
	Packing: Rasching Rings.				

	Material Borosilicate Glass, Feed Tanks: Material Stainless Steel (2Nos.), Cap. 20 Ltrs. • Extract & Raffinate Tanks: Material Stainless Steel (1each), Cap. 10 Ltrs. Feed Circulation: By Compressed Air. Flow Measurement: Rotameters- 2Nos. (One each for solvent & solute) Pressure Regulator: 0-2 kg/cm2.			
	Pressure Gauge: Bourdon type, 0- 2 kg/cm2			
3	<ul> <li>Natural Draft Tray Tower</li> <li>Drying Chamber: Material</li> <li>Stainless Steel, Size (30 x 30 x 30) cm insulated by Ceramic</li> <li>wool and housed in a MS</li> <li>Chamber. Maximum Temperature 120°C.</li> <li>Heater: Nichrome wire heater</li> <li>Weighing Balance: Digital, 0-1000gm. of ± 1 gm resolution.</li> <li>Temp. Sensor: RTD PT-100 type</li> <li>Control panel comprises of:</li> <li>Digital Temp. Controller</li> <li>Digital Temp. Controller: PID</li> <li>Controller, 0-199.9°C</li> </ul>	01		
4	Adsorption in packed column Column (3 Nos.): Material Borosilicate glass of different dia. Feed tank: Material Stainless Steel, Capacity 20 litres. Receiving tank: Material Stainless Steel (3 Nos.), Capacity 5 litres. (For all 3 columns) Feed circulation: FHP, Magnetic Pump made of Polypropylene. Piping: Stainless Steel and PVC of size ¼". Flow measurement: Rotameter for feed. Stop Watch Stop Watch: Electronic.	01		
5	Vertical and horizontal condenser • System: Steam to Water Condensers: Shell and Tube Type, 2 Nos. (Vertical & Horizontal) Insulated by Ceramic wool and cladding by Aluminium foil. Shell: Material stainless steel. ID 108 mm (Approx), Length 500mm (Approx.) Tubes:			

	Material stainless steel, 12 Nos.			
	ID 9.5mm, OD 12.7mm, Length			
	500mm (Approx.)			
	• Condensate Measurement:			
	Measuring Cylinder & Stopwatch			
	Water Flow Measurement:			
	Rotameter, Steam Generator:			
	Made of stainless steel fitted with			
	level indicator, pressure gauge.			
	safety valve, drain and insulated			
	with ceramic wool & cladding			
	with Aluminium foil.			
	• Heaters: Nichrome wire heater			
	(2 Nos.)			
	• Control panel comprising of:			
	Digital Temp. Controller			
	: PID Controller, 0-199.9°C (For			
	Steam Generator)			
	Digital Temp. Indicator			
	Temperature sensors: with multi-			
	channel switch			
	: RTD PT-100 type-6Nos.			
6	Film wise and Drop wise	01		
	Condensation			
	Copper tubes (2 Nos.): one with			
	natural finish and other nickel			
	polished. ID 16 mm, OD: 19 mm			
	(Approx.) Length: 175 mm			
	(Approx.)			
	• Water Flow measurement:			
	i ater i io i incasarement.			
	Rotameter.			
	Rotameter. • Condensate Measurement:			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch : 8 Ltrs. (Approx.) made of			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch : 8 Ltrs. (Approx.) made of Stainless steel with 1.5 kW			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch : 8 Ltrs. (Approx.) made of Stainless steel with 1.5 kW heater. Insulated with ceramic			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch : 8 Ltrs. (Approx.) made of Stainless steel with 1.5 kW heater. Insulated with ceramic wool and cladded by aluminum			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch : 8 Ltrs. (Approx.) made of Stainless steel with 1.5 kW heater. Insulated with ceramic wool and cladded by aluminum foil.			
	Rotameter. • Condensate Measurement: Measuring Cylinder & Stopwatch : 8 Ltrs. (Approx.) made of Stainless steel with 1.5 kW heater. Insulated with ceramic wool and cladded by aluminum foil. • Control valves: One each for			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement:</li> <li>Measuring Cylinder &amp; Stopwatch <ul> <li>8 Ltrs. (Approx.) made of</li> </ul> </li> <li>Stainless steel with 1.5 kW <ul> <li>heater. Insulated with ceramic</li> <li>wool and cladded by aluminum</li> <li>foil.</li> <li>Control valves: One each for</li> <li>Steam, Cooling water &amp; Drain.</li> </ul> </li> </ul>			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement:</li> <li>Measuring Cylinder &amp; Stopwatch <ul> <li>8 Ltrs. (Approx.) made of</li> <li>Stainless steel with 1.5 kW</li> <li>heater. Insulated with ceramic</li> <li>wool and cladded by aluminum</li> <li>foil.</li> <li>Control valves: One each for</li> <li>Steam, Cooling water &amp; Drain.</li> <li>Pressure Gauge: Bourdon type.</li> </ul> </li> </ul>			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement:</li> <li>Measuring Cylinder &amp; Stopwatch <ul> <li>8 Ltrs. (Approx.) made of</li> </ul> </li> <li>Stainless steel with 1.5 kW <ul> <li>heater. Insulated with ceramic</li> <li>wool and cladded by aluminum</li> <li>foil.</li> <li>Control valves: One each for</li> <li>Steam, Cooling water &amp; Drain.</li> <li>Pressure Gauge: Bourdon type.</li> <li>Control panel comprising of:</li> </ul> </li> </ul>			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement:</li> <li>Measuring Cylinder &amp; Stopwatch <ul> <li>8 Ltrs. (Approx.) made of</li> </ul> </li> <li>Stainless steel with 1.5 kW</li> <li>heater. Insulated with ceramic</li> <li>wool and cladded by aluminum</li> <li>foil.</li> <li>Control valves: One each for</li> <li>Steam, Cooling water &amp; Drain.</li> <li>Pressure Gauge: Bourdon type.</li> <li>Control panel comprising of:</li> <li>Digital Temp. Controller: PID</li> </ul>			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement:</li> <li>Measuring Cylinder &amp; Stopwatch <ul> <li>8 Ltrs. (Approx.) made of</li> </ul> </li> <li>Stainless steel with 1.5 kW</li> <li>heater. Insulated with ceramic</li> <li>wool and cladded by aluminum</li> <li>foil.</li> <li>Control valves: One each for</li> <li>Steam, Cooling water &amp; Drain.</li> <li>Pressure Gauge: Bourdon type.</li> <li>Control panel comprising of:</li> <li>Digital Temp. Controller: PID</li> <li>Controller, Digital Temp.</li> </ul>			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement:</li> <li>Measuring Cylinder &amp; Stopwatch     <ul> <li>8 Ltrs. (Approx.) made of</li> </ul> </li> <li>Stainless steel with 1.5 kW     <ul> <li>heater. Insulated with ceramic</li> <li>wool and cladded by aluminum</li> <li>foil.</li> <li>Control valves: One each for</li> <li>Steam, Cooling water &amp; Drain.</li> <li>Pressure Gauge: Bourdon type.</li> <li>Control panel comprising of:</li> <li>Digital Temp. Controller: PID</li> <li>Controller, Digital Temp.</li> <li>Indicator: with multi-channel</li> </ul></li></ul>			
	<ul> <li>Rotameter.</li> <li>Condensate Measurement: Measuring Cylinder &amp; Stopwatch : 8 Ltrs. (Approx.) made of Stainless steel with 1.5 kW heater. Insulated with ceramic wool and cladded by aluminum foil.</li> <li>Control valves: One each for Steam, Cooling water &amp; Drain. Pressure Gauge: Bourdon type.</li> <li>Control panel comprising of: Digital Temp. Controller: PID Controller, Digital Temp. Indicator: with multi-channel switch. Temperature Sensors:</li> </ul>			

Sl. No.	Item with specification	Qty Required	Brand and Model no.	Manuals provided	Warranty 03 years
I	U HTIah			(YES/NO)	(Yes / No)
1	Plate type heat exchanger	01			
		• -			
	System: Water to Water				
	Plates: Material Stainless Steel, 6				
	Nos. Length 425 mm, Width 125				
	mm (approx.)				
	Retargeters (2Nos) one each for				
	cold & hot fluid				
	Hot Water Tank: Made of				
	Stainless steel (Insulated with				
	ceramic wool)				
	Hot Water Circulation: Magnetic				
	Pump				
	Heaters: Nichrome wire heater				
	(2NOS)				
	Digital Temp Controller				
	Temperature Sensors: PID				
	Controller, 0-199.9°C (For Hot				
	Water Tank)				
	Digital Temp. Indicator: 0-				
	199.9°C, with multi-channel				
	Switch				
	100 type-5Nos				
2	Double pipe heat exchanger	01			
-	Double pipe new chemanger	01			
	System: Water to Water,				
	concentric tube type				
	• Heat Exchanger: Length 1.6m				
	(approx.), insulated with ceramic				
	foil				
	• Outer Tube: Material Stainless				
	steel. ID 27.5 mm, OD 33.8 mm				
	(approx.)				
	Water Flow Measurement:				
	Rotameters (2Nos.) one each for				
	cold & hot fluid				
	Hot Water Tank: Made of				
	ceramic wool)				
	Hot Water Circulation Magnetic				
	Pump				

Heaters: Nichrome wire heater		
(2Nos)		
Digital Temp. Controller: PID		
Controller, 0-199.9°C (For Hot		
Water Tank)		
Control panel comprising of		
Digital Temp Controller: 0-		
199.9°C, with multi-channel		
switch		
Temperature Sensors: RTD PT-		
100 type-5Nos.		

# **TECHNICAL BID**

# (Should be submitted in a sealed envelope separately)

Sl.	Item with specification	Qty	Brand and Model no.	Manuals	Warranty
No.		Required		provided	03 years
				(YES/NO)	(Yes / No)
	. FT Lab.				
1	Bomb Calorimeter	01			
	Bomb calorimeter Delux model				
	with differential type digital with				
	thermometer, accuracy 0.01 c				
	built-in timer and connected to				
	electronic firing unit for				
	simultaneous operation.				
2	Hot Air Oven	01			
	Stainless Steel Rod Trays				
	to ensure uniform				
	temperature distribution				
	230V AC, Single Phase,				
	50Hz, supply Temperature				
	Range: 5C above ambient				
	to 250C will be provided.				
	• Temperature Accuracy:				
	0.2°C Temperature				
	Uniformity: 1°C				
	Control System: Imported				
	Microprocessor based				
	auto tuned PID controller				
	with CE mark & dual				
	display of set value &				
	process value for precise				
	control of temperature.				

	• Capacity 216 Ltrs. with 3			
2	Lifays	01		
5	Redwood viscometer	01		
	Red wood now between 20			
	seconds to 2000 seconds. The			
	Stainlass staal bath with alastrical			
	beating arrangement suitable to			
	operate at 220 Volts AC Mains			
	with top oil our with procision			
	stainless steel jet cup cover ball			
	valve thermometer-clin Stirrer			
	and M.S. Sheet stand The			
	apparatus also equipped with			
	digital indicator. Controller			
	& FHP motor with lighting			
	arrangement			
	C			
4	Muffle Furnace	01		
	1. Working temperature up			
	to 1100°C max.			
	2. Design for max. over			
	shoot temperature up to			
	1200 °C., soaking time for			
	continues working temp.			
	1100 °C, max. 8 hours.			
	3. Temperature Controller:			
	PID Profile with 4 amp &			
	4 Soak step control logic.			
	Control logic with SSR			
	control power pack & PID			
5		02		
5	Ear the analysis of CO2	02		
	• For the analysis of CO2,			
	levelling bottles 100ml			
	gas burette with outer			
	iacket three absorption			
	nipettes (two filled with			
	glass tubes one filled with			
	copper spiral and glass			
	tubes). 3-test manifold,			
	calcium chloride tube and			
	rubber below in wooden			
	case with sliding doors.		 	
6	Magnetic Stirrer with hot plate	04		
	1. Temperature Range: 350-			
	400°C			
	2. Speed Range: 200 to 1500			
	rpm			
	3. Electrical: 120 or 230V,			

	50-60Hz, 500W			
7	Cloud and Pour Point	02		
	Apparatus			
8	Pensky-Marten Apparatus	04		
	1. Brass Test Cup with			
	handle			
	2. Heater: Nichrome wire			
	3. Temperature: 40- 360°C			
	4. Energy Regulator for			
	temperature regulation			
9	Conradson Carbon residue	02		
	Apparatus			
	1. Spun sheet iron crucible,			
	Sheet Iron hood, sheet			
	iron block on a stand, gas			
	Burnor			
10	Cleveland Open Cup	02		
10	Apparatus			
	1. Sample holder pan			
	2. Heater			
	3. Temperature: up to 300°C			
11	Digital Weight Balance	04		
	1. Weighing Capacity			
	200gm			
	2. External Calibration			
	Weight: Free with Scale			
	3. Magnet Display Led /			
	LCD Pan Size 0.80 mm			
	4. Minimum Weighing			
	Value: 0.0008 g			
	5. Readability 0.001 g;			
	Linearity +- 0.003 g			
1		1	1	1

Sl. No.	Item with specification	Qty Required	Brand and Model no.	Manuals provided (YES/ NO)	Warranty 03 years (Yes / No)
V	L. CRE Lab.			()	()
1	Microfluidic Channel Reactor	01			
-	1. Holds 2 Syringes up to 60	01			
	mL each.				
	2. Infusion rates from 1.436				
	$\mu$ L/hr (1 mL syringe) to				
	7515 mL/hr (60 mL syringe)				
	3. Operates stand-alone or				
	from a computer				
	4. keypad interface				
	5. Fully programmable;				
	automation capable				
	6. Infusion and withdrawal				
	7. Set a single pumping rate				
	and/or dispensing volume				
	Dispensing accuracy of +/-1%				
2	Variable speed stirrer fitted	01			
	Spinning disc Reactor				
	Reactor Vessel: Material				
	1000 ml				
	1000 IIII. Desket: Meterial Stainlass Steel				
	Fitted with appropriate Stainless				
	Steel				
	Drive for Basket: Variable speed				
	DC Motor with Thyristor				
	controlled DC Drive for Variable				
	Speed.				
	Packing: Catalyst				
	Feed Tank: Material Stainless				
	Steel, Capacity 10 Ltrs.				
	Flow Measurement: By				
	Rotameter				
	Pressure regulator: Range 0-2				
	kg/cm <sup>2</sup> : Bourdon Type, 0-2				
2	kg/cm <sup>2</sup>	01			
3	variable speed stirrer litted	01			
	bating jocket				
	Reactor Vessel: Material				
	Stainless Steel Effective Volume				
	1000 ml				
	Basket: Material Stainless Steel				
	Fitted with appropriate Stainless				
	Steel.				
	Drive for Stirrer: Variable speed				
	DC Motor with Thyristor				

	controlled DC Drive for Variable			
	Speed.			
	Packing: Catalyst			
	Feed Tank: Material Stainless			
	Steel, Capacity 10 Ltrs.			
	Flow Measurement: By			
	Rotameter			
	Pressure regulator: Range 0-2			
	kg/cm <sup>2</sup> : Bourdon Type, 0-2			
	kg/cm <sup>2</sup>			
4	Micropipette (1 mL and 200	02		
	μL)			
	• STANDARD (1 mL and			
	200 µL)			
5	Ultrasonic bath for mixing	01		
	Probe sonicator			
	Square shape			
	• Frequency: 20/30 KhZ			
	• Temperature: 150°			
	• STANDARD (1 mL and 200			
	• STANDARD (1 IIIL and 200			
6	Laboratory Centrifuge	01		
0	$\Delta/C$ stirrer with 1/4 HP	01		
	• A/C suffer with 1/4 III Brushless, High Torque			
	Variable Speed Motor			
	with Hollow Shaft &			
	propeller of SS 316			
	chuck having facility			
	indication of speed			
	Stirring Eluid: Water /			
	• Stiffing Fluid. Water /			
	Elight Off			
	• Suming Capacity (Ltrs.):			
	40 LIKO			
	• Impeller: - Kadial turbine			
	• No. of tubes: 6			
	• Volume of tubes: 15 mL			

Sl. No.	Item with specification	Qty Required	Brand and Model no.	Manuals provided (YES/ NO)	Warranty 03 years (Yes / No)	
VII. PDC Lab.						
1	<ul> <li>Single Tank System</li> <li>Material Stainless Steel, Circular, with level scale (1No.) Capacity</li> <li>3.5 litres (approx.)</li> <li>Supply Tank: Material Stainless</li> <li>Steel, Capacity 20 litres (approx.)</li> <li>Overhead Tank: Material</li> <li>Stainless Steel, Capacity 5 litres (approx.)</li> <li>Water circulation: FHP Pump, Champion/Standard make.</li> <li>Piping: SS &amp; PVC, size <sup>1</sup>/<sub>4</sub>"</li> <li>Flow measurement: By Rotameter</li> </ul>	01				
2	<b>Two Tank Interacting system</b> Material Stainless Steel, Circular, with graduated level scale (2Nos.), Capacity 3.5 litres each	01				
3	Two Tank Non-Interacting system Material Stainless Steel, Circular, with graduated level scale (2 Nos.), Capacity 3.5 litres	01				
4	<b>Temperature Control Trainer</b> Level Transmitter: Range 0-300 mm, Capacitance Type, Output 4- 20 mA Process tank: Material SS with Scale. Capacity 2 Ltrs approx. Water tank: Material Stainless Steel, Capacity 10 Ltrs. Water Circulation: FHP Pump. Champion/Standard make. Flow Measurement: By Rotameter. Control valve: Compatible capacity with pneumatic actuator. I/P converter: Input 4-20mA, Output 3-15 PSIG.: 0-2 kg/cm <sup>2</sup> .	01				
5	Characteristics of PID	01				

controller			
Stirred Tank	Material Stainless		
Steel, Capaci	ty 2 Ltrs (approx.)		
Stirrer: Stain	less Steel Impeller		
and shaft cou	pled with FHP		
Motor.	-		
Flow Measur	rement: By		
Rotameter (0	-20 LPH), Eureka		
make			
Stop Watch:	Electronic		
Heater: Nich	nrome wire heater.		

# FINANCIAL BID

(Should be submitted in a sealed envelope separately)

## LIST OF ITEMS

I.	FF Lab.			
S1.	Item with specification	Qty	Total cost	TAX (%)
No.		Required	(Inclusive of all taxes	
			F.O.R. to IGIT	
			Sarang and	
			installation etc.) (Rs.)	
1	Venturi Meter	01		
2	Orifice Meter+ Venturi Meter	01		
3	Pitot Tube	01		
4	Variable Speed Reciprocating	01		
	Pump			
5	Variable Speed Centrifugal Pump	01		

Signature and Seal of the firm.

# FINANCIAL BID

(Should be submitted in a sealed envelope separately)

## LIST OF ITEMS

I	I. MO Lab.			
Sl. No.	Item with specification	Qty Required	Total cost (Inclusive of all taxes F.O.R. to IGIT Sarang and installation etc.) (Rs.)	TAX (%)
1	Ball mill	01		
2	Jaw crusher	01		
3	Single deck vibrating screen	01		
4	Disc pelletizer	01		

# FINANCIAL BID

(Should be submitted in a sealed envelope separately)

## LIST OF ITEMS

I	I. MT Lab.			
S1.	Item with specification	Qty	Total cost	TAX (%)
No.		Required	(Inclusive of all taxes	
			F.O.R. to IGIT	
			Sarang and	
			installation etc.) (Rs.)	
1	Solid-Liquid extraction in Packed	01		
	bed type			
2	Liquid-Liquid Extraction in	01		
	packed tower			
3	Natural Draft Tray Tower	01		
4	Adsorption in packed column	01		
5	Vertical and horizontal condenser	01		
6	Film wise and Drop wise	01		
	Condensation			

Signature and Seal of the firm.

## FINANCIAL BID

(Should be submitted in a sealed envelope separately)

### LIST OF ITEMS

I	V. HT Lab.			
Sl. No.	Item with specification	Qty Required	Total cost (Inclusive of all taxes	TAX (%)
		-	F.O.R. to IGIT	
			Sarang and	
			installation etc.) (Rs.)	
1	Plate type heat exchanger	01		
2	Parallel and counter flow shell	01		
	and tube heat exchanger			

# FINANCIAL BID

### (Should be submitted in a sealed envelope separately)

### LIST OF ITEM

V	. FT Lab.			
S1.	Item with specification	Qty	Total cost	TAX (%)
No.		Req	(Inclusive of all taxes F.O.R.	
		uire	to IGIT Sarang and	
		a	installation etc.) (Rs.)	
1	Bomb Calorimeter	01		
2	Hot Air Oven	01		
3	Redwood Viscometer	01		
4	Muffle Furnace	01		
5	Orsat Analyzer	02		
6	Magnetic Stirrer with hot plate	04		
7	Cloud and Pour Point Apparatus	02		
8	Pensky-Marten Apparatus	04		
9	Conradson Carbon residue	02		
	Apparatus			
10	Cleveland Open Cup Apparatus	02		
11	Digital Weight Balance	04		

Signature and Seal of the firm.

## FINANCIAL BID

### (Should be submitted in a sealed envelope separately)

### LIST OF ITEMS

VI. CRE Lab.							
S1.	Item with specification	Qty	Total cost	TAX			
No.		Req.	(Inclusive of all taxes F.O.R. to IGIT	(%)			
			Sarang and installation etc.) (Rs.)				
1	Microfluidic Channel Reactor	01					
2	Variable speed stirrer fitted	01					
	Spinning disc Reactor						
3	Variable speed stirrer fitted batch	01					
	reactor with cooling heating jacket						
4	Micropipette (1 mL and 200 µL)	02					
5	Ultrasonic bath for mixing	01					
6	Laboratory Centrifuge	01					

# LIST OF ITEMS

VII. CRE LAb							
Sl. No.	Item with specification	Qty Required	Total cost (Inclusive of all taxes	TAX (%)			
			F.O.R. to IGIT				
			Sarang and				
			installation etc.) (Rs.)				
1	Single Tank System	01					
2	Two Tank Interacting system	01					
3	Two Tank Non-Interacting	01					
	system						
4	Temperature Control Trainer	01					
5	Level Control Trainer	01					
6	Characteristics of PID controller	01					

#### CHECK LIST

#### **TENDER NO:**