

Updated on 10/06/2023

**CSIR-Central Mechanical Engineering Research Institute
PROCUREMENT PLAN***

*(*Please read the note given at the end)*

A FOR THE FINANCIAL YEAR 2024-25

A (a) EQUIPMENT

(i) Equipment: Out of CSIR Infra Grant

Sr. No.	Name Category of Equipment/ Vehicle Item	Quantity (Nos.)	Approximate Cost (Rs. In Lakhs)
1	Iris Motion amplification Camera	1	45
2	Noise Meter	1	5
3	Ultrasonic Fault Detector and Bearing Lubrication Checker	1	20
4	Motor current signature analysis	1	35
5	Higher accuracy, computer controlled servo hydraulic UTM of 1500KN capacity	1	290
6	Video scope along with camera attachment	1	30
7	Portable Hardness Tester	1	10
8	Ultrasonic Thickness gauge	1	3
9	Block Gauge Calibrator / Measurement Unit	1	30
10	Laser Interferometer Measurement System	1	75
11	Investment Casting Plant	1	250
12	Vacuum Induction Melting & Casting Furnace with Liquid Metal Cooling option for SC/DS Components	1	1500
13	Particle Size Analyser	1	50
14	Semi-Automated Hydraulic Press	1	25
15	Oxygen activity measurement system for ferrous alloys	1	5
16	Impact testing Machine	1	5
17	Upgradation of existing Sigma Zeiss FESEM with correlative microscopy	1	50
18	Upgradation of existing FESEM (SIGMA HD) with texture feature facility alongwith vacuum level enhancement	1	235
19	Upgradation of High Temperature Test Facility	1	30
20	Upgradation of Room Temperatue Tensile Test Facility	1	8
21	Upgradation of Brinell and Vickers Hardness Machine	1	6
22	Shop Floor Dust Collector	1	10
23	Industrial Fan for Shop floor	1	4
24	DAQ for ultrasonic guided waves generation and sensing of up to 1 MHz frequency	1	32
25	Furnace	1	25
26	Optical Emission Spectrometer	1	25
27	Fiber Laser Source, Chiller and optical head	1	70
28	Imaging pyrometer – dual wavelength	1	15

29	IR Camera	1	30
30	Laser Powder Bed Fusion Additive Manufacturing system	1	350
31	Powder Delivery System	1	10
32	CNC 5-axis translational and rotational stage	1	100
33	Cold Transfer Robotic Welding	1	40
34	NI PXI Module	1	10
35	Computing Platform	1	10
36	NI cRIO Controller	1	10
37	Servo Motor with Controller, 15 kW	1	12
38	License Servers (5 nos.)	1	10
39	Computing Platform (5 nos.)	1	10
40	Electron-beam physical vapor deposition (EBPVD) system	1	50
41	Drop Shape Analyser	1	35
42	High Precision Weighing Balance	1	3
43	150 kW E-MOTOR TEST BED with Battery Emulator, Dyno Setup, Combined Altitude & Environmental Chamber and control accessories	1	800
44	Bi-axial Rotomolding Machine	1	25
45	Filament Winding Machine (Gantry Type)	1	60
46	Customized Curing Oven	1	15
47	Laser Welding Machine for Battery / Supercapacitor	1	25
48	Upgradation of transaxle test bed	1	50
49	Data logger with Torque/Speed sensor, Current/Voltage measurement system	1	25
50	3 point hitch load cell for tractor testing	1	10
51	Thermal camera	1	8
52	Typhoon HIL Real Time HIL Simulator	1	75
53	Multichannel DAQ with Triaxle Accelerometer	1	25
54	Bench Scale Parallel Twin-Screw Extruder with Mico-injection Molding, Melt Pump and Filament Spooler with LASER based diameter monitoring system	1	180
55	Abrasive Waterjet Cutting Machine	1	100
56	Fatigue Testing Machine for Composites	1	35
57	Different low value machines for ACMC	1	25
58	Video Extensiometer	1	20
59	Micro AutoBox III	1	200
60	Vibration Exciter	1	20
61	Impedance analyzer	1	10
62	Tractor PTO dynamometer	1	8
63	Compressor with pneumatic Ruchet	1	5
64	3 tonne gantry crane	1	5
65	2 kW portable welding machine	1	2
66	High-end Workstation/ High Performance computing platform	1	10
67	Multipurpose X-Ray Diffraction System	1	250
68	Flue Gas Analyzer	1	10
69	Thermal Conductivity Analyzer for Liquid	1	15
70	HPLC	1	35
71	Multi Gas Analyzer	1	20

72	Experimental setup for gas mixing and control	1	15
73	Test setup for Hydrogen ICE & Eddy Current Dynamometer	1	75
74	DSC with heating & cooling capability	1	20
75	Gas Chromatography	1	40
	4-Axes Motion Stage on Air Bearing	1	27
76	Centrifuge (20,000 RPM) 50 ml with cooling	1	22
77	Potentiostat/Galvanostat (Biosensor applications)	1	17
78	Customized Robot Wrist with high precision 6-Axes Force/ Torque Sensor, OR, Schunk (ATI) Force/Torque Sensor - FTN-Omega85 SI-475-20	1	14
79	Open Architecture robot manipulator	1	20
80	Portable and Benchtop Microvolume UV Visible Spectrophotometer	1	15
81	Motion Capture System	1	25
82	CO2 Laser Sheet Cutting System	1	4
83	Precision Towing Carriage for Shallow Basin (Basin size: Length=50m and Width=10m)	1	40
84	Optical Modem for Underwater Communication (Range 20 meter or more ; Throughput 2 Mbps or more)	1	45
85	Control Console container (Approx. Size: 20 ft. X 8 ft. X 8.5 ft.) for testing of underwater vehicles with associated accessories and tools	1	24
86	Multifunctional printer / plotter	1	5
87	Portable hardness tester	1	10
88	CNC Wire Cut	1	150
89	Multi-Tasking Machine	1	650
90	Multi Axis Machining Centre	1	1000
91	VC setup for Accounts and Admin - 2 nos.	2	8
92	VC Setup for Director's Conference Room-1	1	25
93	Upgradation of Firewall (HA)- 2nos.	2	30
94	Upgradation of Log Analyzer (HA) - 2	2	10
95	Antivirus License - 500 for 3 years (will be required next FY)	1	9
96	MsOffice License - 300 for 3 years	1	55
97	Router - 1	1	8
98	Ms Visual Studio - 10 nos	10	5
99	Adobe Acrobat - 20 nos (1 for each dept) for 3 years	20	9
100	45-55 hp Tractor and basic agri-equipment for field activities	1	15

(ii) Equipment: Out of CSIR Funded Projects

Sr. No	Name Category of Equipment/ Vehicle Item	Quantity (Nos.)	Project Number/ Code	Approximate Cost (Rs. In Lakhs)
1	Core Drying Oven	1		5
2	Shot Blasting Machine	1		20

3	Weight Measuring machine	1		2
4	Band Saw	1		10
5	CNC stages for Single Platform	1		50
6	3D Wax Printer	1		5
7	Workstation	1		5
8	VFD Motor setup and attachments	1		5
9	Tractor	1		7
10	Workstation and its peripherals	1		3
11	Stereo Projector	1		25
12	Gas Chromatography with Mass Spectroscopy	1		40
13	Linear Reciprocating/Rotary Tribometer Rig	1		25
14	Ultrasonic Probe Sonicator	1		5
15	CVD Setup & Accessories	1		40
16	High Temperature Furnace	1		5
17	Electrical Conductivity Meter	1		5
18	Electrometer	1		18
19	Oscilloscope	1		8
20	Digital Force Gauge	1		12
21	LCR Meter	1		5
22	Current Preamplifier	1		5
23	Spin Coating System	1		2
24	High Precision Weighing Balance	1		3
25	Compact DAQ System	1		6.5
26	Proximity Probe with Sensors and Output Extension Cable	1		5
27	Mobile Workstation	1		1.6
28	Planetary Ball Mill	1		6
29	Rotation/Revolution Super Mixer for viscous liquid with PC connectivity	1		14
30	High temperature (1700 deg C or higher) atmosphere controlled furnace	1		10
31	Centrifuge Machine	1		5
32	High Power Programmable DC Supply	1		20
33	Mechanical Breadboard	1		2
34	Torque Sensor	1		8
35	BLDC/PMSM Motors and Drives	1		10
36	Inverter and Drives	1		3
37	380V, 75 A DC power supply	1		4.75
38	72V, 75 A (150A Max) DC power supply	1		4.5
39	Silica Plastic reprocessing machine	1		12
40	Glass removal machine	1		13
41	Workstation computer	1		5
42	Solar PV Panel & Battery	1		3
43	Inverter	1		3.5
44	Hot plate starrer	1		4
45	Hot Air Oven	1		4
46	Liquid flow measurement and control system	1		15
47	Pyrolyser	1		3

48	Electrical Motor with controlling mechanism	1		6
49	Water boat vessel	1		5
50	Workstation computers	1		10
51	Horizontal Conveyor	1		2
52	Plasma Reactor	1		2.5
53	Biogas storage tank with pipeline and burner	1		12
54	Reactor	1		2.5
55	Thermal camera	1		10
56	High-end Workstation/ High Performance computing platform	1		15
57	Camera	1		3
58	Rugged Mobile workstation	1		5
59	Mechanical Breadboard	1		2
60	Vibromyography/ Mechanomyography: Data Acquisition System with VMG and associated Software	1		18
61	High Density EMG Acquisition System (Delsys etc.): Base Station, sensors (Trigno etc.), IMU, Goniometer, Power supply, Trigger unit and Software	1		20
62	Workstation preferably with (Intel Gold Processor and 128 GB memory)	1		1.5
63	Highend Computing platform (dedicated to project) for Cloud infrastructure, Database management, AI/ML applications and inference	1		15
64	FDM 3D Printer	1		8
65	Raisin Printer (SLS/SLA)	1		5
66	CO2 Laser Sheet Cutting System	1		4
67	Low force UTM machine	1		10
68	SBC	1		1.64
69	Panel Monitor	1		0.82
70	PM Sensors	1		11.5
71	GPS	1		0.33
72	Weather Station	1		2
73	Camera and access points	1		3
74	Centrifugal Pump with Motor	1		1.5
75	Compressor with Tank	1		1.5
	Electrical actuators	1		3.5
76	Customised UAV chassis, BLDC motors, ESCs, propellers, flight controllers, mounting arrangement for GPR, telemetry modules electrical and mechanical accessories for UAV development	1		9.5
77	Li-Po/Li-on/Solid-state batteries	1		4.5
78	Remote launching and retrieving scissor mechanism	1		3
79	Ground Computational Platform for post-processing of GPR signatures and development of ML algorithm	1		15
80	Gimbal mounted Optical/IR sensor for UAV	1		7

81	Radio Controller cum Video Link (2 no)	2		2
82	Communication Link For GPR	1		10
83	3 Way Acoustic Positioning System with Integrated Modem for Underwater Vehicles (Range: 5 Km or more Throughput: 5 Kbps or more)	1		75
84	Underwater Thruster (6.5-10 kgf Forward thrust), 6 set	6 Set		45
85	DVL Integrated AHRS and INS for pre-calibrated attitude, heading, and position information with integrated Pressure Sensor and Altimeter	1		22
86	MEMS based IMU, AHRS and INS (multiple units)	1		14
87	GPS Receiver with Custom designed Underwater Antenna for L1 and L2 Bands	1		12
88	Monitoring Drone	1		6
89	Underwater Lamps	1		10
90	Customised Hydraulic Actuators with Power Pack for Homing Docking	1		15
91	Underwater Rotary Actuators, 4 set	4 Set		24
92	Uncrewed Surface Vessel with Long Range Antenna Surface Module for Remote Operation - 2 Nos	2		12
93	Custom Design Power Cum Data Line 200 meter Long Cable Handling Winch with Slip Ring - 2 Nos	2		16
94	Transmitter cum USBL Receiver / Locator with Custom Powered Battery Design	1		7
95	Underwater Ultrasonic Thickness Gauge	1		5
96	Different lab instruments (Functional generator, Oscilloscope, Power supply etc)	1		12
97	Satcom Locator (1 yr licence)	1		3.5
98	RF Beacon	1		3.5
99	Xeon Flasher	1		7
100	Workstation / PC /Laptop	1		10
101	Altair MMU 10 Tokens for GPU acceleration of Simulation Softwares	1		9
102	Computer - Workstation (High End) for Simulation Softwares	1		9
103	Light Detection and Ranging sensor for enabling different applications for Precision Agriculture	1		5
104	Farm Machinery: a. Harrow (Disc Type) Double Row (11 Disc) 2 Row b. Seed Cum fertilizer drill with furrow openers c. Mould Board Plough Reversible (Hydraulic) 2 Row d. Spring loaded tyne cultivator (11 tyne min.) e. Bed Former / Ridge Maker (1 row) f. Any other small equipment as per requirement	1		4.2

105	Rugged Laptop for field level data acquisition and use as a DAQ during tractor operation			4
106	Test Bed Manipulator Arms	2		10
107	Industrial Embedded Computer/Controller as part of system to be developed	1		5
108	Rugged computer as Control Console of the system to be developed	1		5
109	Mechanical Breadboard for the System to be developed	1		5
110	CNC Sheet Rolling Machine	1		15
111	Altum PT Multispectral Sensor – For Drones	1		16
112	Laser Welding Machine	1		22
113	Three-Point Linkage Force Measurement System	1		18
114	RTK 2 High Precision RTK PPK GNSS Module	1		12
115	CNC Sheet Bending Machine	1		25
116	Server for Project Documentation and Software Licensing, User Management	1		10

(iii) Equipment: Out of Externally Funded Projects (EFP)

Sr. No	Name Category of Equipment/ Vehicle Item	Quantity (Nos.)	Project Number/ Code	Approximate Cost (Rs. In Lakhs)
1	Shaft Torque Transducer	1		11
2	Axle Torque Transducer	1		5
3	Pulley Torque Transducer	1		3
4	EMG sensor	1		15
5	Platform type weighing pad (4 nos., capacity - 5 ton) measuring set up	1		3
6	Pedal force measuring device	1		2
7	High Performance Computing (HPC) and graphics Nodes	1		30
8	Immersive Stereo display / HMD	1		4
9	Tractor	1		7
10	Workstation and its peripherals	1		3
11	Stereo Projector	1		25
12	Gas Chromatography with Mass Spectroscopy	1		40
13	CVD Setup & Accessories	1		40
14	High Temperature Furnace	1		5
15	Electrical Conductivity Meter	1		5
16	Electrometer	1		18
17	Oscilloscope	1		8
18	Digital Force Gauge	1		12
19	LCR Meter	1		5
20	Current Preamplifier	1		5

21	Spin Coating System	1		2
22	High Precision Weighing Balance	1		3
23	Compact DAQ System	1		6.5
24	Proximity Probe with Sensors and Output Extension Cable	1		5
25	Mobile Workstation	1		1.6
26	Planetary Ball Mill	1		6
27	Rotation/Revolution Super Mixer for viscous liquid with PC connectivity	1		14
28	Electrical Motor with controlling mechanism	1		6
29	Water boat vessel	1		5
30	Workstation computers	1		10
31	Horizontal Conveyor	1		2
32	Plasma Reactor	1		2.5
33	Biogas storage tank with pipeline and burner	1		12
34	Reactor	1		2.5
35	Thermal camera	1		10
36	Vibromyography/ Mechanomyography: Data Acquisition System with VMG and associated Software	1		18
37	High Density EMG Acquisition System (Delsys etc.): Base Station, sensors (Trigno etc.), IMU, Goniometer, Power supply, Trigger unit and Software	1		20
38	Workstation preferably with (Intel Gold Processor and 128 GB memory)	1		1.5
39	Highend Computing platform (dedicated to project) for Cloud infrastructure, Database management, AI/ML applications and inference	1		15
40	FDM 3D Printer	1		8
41	Raisin Printer (SLS/SLA)	1		5
42	SBC	1		1.64
43	Panel Monitor	1		0.82
44	PM Sensors	1		11.5
45	GPS	1		0.33
46	Weather Station	1		2
47	Camera and access points	1		3
48	Centrifugal Pump with Motor	1		1.5
49	Compressor with Tank	1		1.5
50	Electrical actuators	1		3.5
51	Customised UAV chassis, BLDC motors, ESCs, propellers, flight controllers, mounting arrangement for GPR, telemetry modules electrical and mechanical accessories for UAV development	1		9.5
52	Li-Po/Li-on/Solid-state batteries	1		4.5
53	Remote launching and retriving scissor mechanism	1		3

54	Ground Computational Platform for post-processing of GPR signatures and development of ML algorithm	1		15
55	Gimbal mounted Optical/IR sensor for UAV	1		7
56	Radio Controller cum Video Link (2 no)	2		2
57	Communication Link For GPR	1		10
58	3 Way Acoustic Positioning System with Integrated Modem for Underwater Vehicles (Range: 5 Km or more Throughput: 5 Kbps or more)	1		75
59	Underwater Thruster (6.5-10 kgf Forward thrust), 6 set	6 Set		45
60	DVL Integrated AHRS and INS for pre-calibrated attitude, heading, and position information with integrated Pressure Sensor and Altimeter	1		22
61	MEMS based IMU, AHRS and INS (multiple units)	1		14
62	GPS Receiver with Custom designed Underwater Antenna for L1 and L2 Bands	1		12
63	Monitoring Drone	1		6
64	Underwater Lamps	1		10
65	Customised Hydraulic Actuators with Power Pack for Homing Docking	1		15
66	Underwater Rotary Actuators, 4 set	4 Set		24
67	Uncrewed Surface Vessel with Long Range Antenna Surface Module for Remote Operation – 2 Nos	2		12
68	Custom Design Power Cum Data Line 200 meter Long Cable Handling Winch with Slip Ring - 2 Nos	2		16
69	Transmitter cum USBL Receiver / Locator with Custom Powered Battery Design	1		7
70	Underwater Ultrasonic Thickness Gauge	1		5
71	Different lab instruments (Functional generator, Oscilloscope, Power supply etc)	1		12
72	Satcom Locator (1 yr licence)	1		3.5
73	RF Beacon	1		3.5
74	Xeon Flasher	1		7
75	Workstation / PC /Laptop	1		10

B	FOR NEXT 2-4 FINANCIAL YEARS (2025-29) (From 01/04/2025 to 31/03/2029)
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B (a)	EQUIPMENT
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Sr. No.	Name of Equipment / Item	Quantity (Nos.)	Approximate Cost (Rs. In Lakhs)
1	Ultrasonic Oxide scale Thickness gauge	1	12
2	Handheld XRF alloy analyser	1	30
3	Electrochemical workstation	1	18
4	Mounting press	1	15
5	High Accuracy Large Size CMM	1	200
6	Vacuum Induction Melting Furnace	1	500
7	Industrial CT for inspection and metrology	1	800
8	Spray Dryer	1	10
9	100kN HT Thermo Mechanical Fatigue System	1	250
10	C-Si Analyzer	1	5
11	Melting/Holding Furnace	1	15
12	Mould making, mould quality control and fettling tools	1	6
13	Vacuum system and controller for Single Platform	1	10
14	Viscometer upto 1600 degree	1	25
15	Universal Wood Machine	1	3
16	Oil Free Screw Compressor with VSD, 10 bar, Max 25 cum/min, water cooled with water chiller	1	70
17	Vibration Testing Equipment (MIL 810D, RTCA DO 160G)	1	80
18	Shock Testing Equipment (MIL 810D, RTCA DO 160G)	1	70
19	Closed circuit wind tunnel with a test section size of 1.5 m x1.5 m and velocity of around 60 m/s	1	150
20	Three component Laser Doppler Velocimetry system with software and 3D traverse system	1	130
21	Electrophoretic coating system	1	30
22	Cutting Force Measurement System	1	20
23	Plasma Spray Coating System	1	200
24	DC/RF Sputtering Set Up	1	50
25	Coatings Thickness Measurement System	1	25
26	High current booster with multichannel workstation	1	65
27	Altum PT Multispectral Sensor – For Drones	1	16
28	Torque Sensor and Three-Point Linkage Force Measurement System	1	18
29	Server for Project Documentation and Software Licensing, User Management	1	10
30	Mixed Signal Oscilloscope	1	3
31	RTK 2 High Precision RTK PPK GNSS Module	1	12
32	Instrumentation of Tractor for Testing, Data Acquisition, and Monitoring [customized solution]	1	24
33	LIDAR for terrestrial mapping	1	12
34	Autosteering of Tractor	1	8

35	Energy Meter	1	12
36	CANBUS Displays, Sensors and Cables	1	12
37	CNC Sheet Bending Machine	1	25
38	CNC Welding Machine (2kW)	1	25
39	CNC Lathe Machine	1	25
40	Welding Fixture Table	1	5
41	CNC Sheet Rolling Machine	1	15
42	Shearing Machine	1	7
43	CNC Vetical Milling Machine	1	20
44	1 KW Laser cutting machine	1	90
45	Coriolis Mass Flow Meter (04)	4	20
46	Data Acquisition System	1	35
47	Biogas purification, compression, bottling system	1	25
48	CHNS Analyzer	1	50
49	Proximate Analyzer	1	35
50	Dryness fraction meter	1	10
51	Autotitrator	1	10
52	Low GWP refrigeration testing facility	1	250
53	Battery Operated Ground Vehicle/ Cart	1	5
54	Lidar (3 nos)	3	2
55	Customized manipulators, Grippers, including specific robot/gripper controllers including Force/Torque Sensor	1	40
56	Extruder based 3D printing system	1	4
57	Customized Manipulator with integrated Force-Torque Sensors	1	45
58	BLDC Motors and Drives	1	10
59	Dynamic Mechanical Analyzer (DMA)	1	50
60	Hyperbaric Pressure Chamber (1.2 m dia, 3m L, 600 bar)	1	300
61	Underwater Tracking Camera / Underwater IP camera with Custom Design Software for Object Detection and Classification in Fresh and Turbid Ambient Waters	1	14
62	Depth Sensor Integrated with Data Processing Data Acquisition System	1	5
63	Dynamometer for towing platform	1	150
64	Rate table for rotary and linear motion	1	20
65	High-end Workstation/ High Performance computing platform	1	25
66	Rugged Mobile workstation, 3 set	3 Set	15
67	Underwater Laser based Imaging	1	90
68	3-D Imaging SONAR	1	40
69	2-D Imaging SONAR	1	15
70	VC Setup for Central VC Room-1	1	15
71	Server - 8 Nos.	8	64
72	Upgradation of Authenticator Device (HA)-2	2	10
73	IT Asset Management Software -1	1	10
74	SAN Storage - 50 TB	1	95
75	Access/ Edge Switches - 30	30	90
76	Upgradation of WiFi Setup	1	70
77	Smart Server Racks - 4 Nos	4	40
78	NAC Appliance – 1	1	15
79	Altum PT Multispectral Sensor – For Drones	1	16
80	Torque Sensor and Three-Point Linkage Force Measurement System	1	18
81	Server for Project Documentation and Software Licensing, User Management	1	10
82	Mixed Signal Oscilloscope	1	3

83	RTK 2 High Precision RTK PPK GNSS Module	1	12
84	Instrumentation of Tractor for Testing, Data Acquisition, and Monitoring	1	24
85	LIDAR for terrestrial mapping	1	12
86	Autosteering of Tractor	1	8
87	Energy Meter	1	12
88	CANBUS Displays, Sensors and Cables	1	12
89	CNC Sheet Bending Machine	1	25
90	CNC Welding Machine (2kW)	1	25
91	CNC Lathe Machine	1	25
92	Welding Fixture Table	1	5
93	CNC Sheet Rolling Machine	1	15
94	Shearing Machine	1	7
95	CNC Vertical Milling Machine	1	20
96	1 KW Laser cutting machine	1	90
97	Industrial GPU for AI applications	1	2.4
98	IoT Gateways for applications	1	1.6
99	Telerobotic master arm with kinesthetic feedback: Haptic device	1	80
100	Modular High Power Amplifier Controller for piezoelectric actuator	1	5
101	Data Glove	1	5
102	Rugged portable workstation as part of system to be developed	1	5
103	Jetson AGX Orin 64GB Developer Kit with Intel Camera D435i	1	3
104	AI Server J2032 - NVIDIA® Jetson NX Xavier	1	2
105	CNC Lathe Machine	1	25
106	Welding Fixture Table	1	5
107	GL 2/3" Monochrome USB3 Camera with 18mm fixed focal length lense	1	2
108	Shearing Machine	1	7
109	CNC Vertical Milling Machine	1	20
110	Fuel Measurement System for tractor	1	2
111	Loadcells with Digital Display	1	2
112	1 KW Laser cutting machine	1	90
113	Energy Meter	1	12
114	Mixed Signal Oscilloscope	1	3
115	Instrumentation of Tractor for Testing, Data Acquisition, and Monitoring [customized solution]	1	24
116	Autosteering of Tractor	1	8
117	CANBUS Displays , Sensors and Cables	1	12
118	Automatic viscometer	1	1.5
119	Closed cup automatic flash a fire point apparatus (This apparatus is used for determination of flash point and fire point of petroleum products)	1	4.45
120	Ramsbottom carbon residue content apparatus (To measure carbon residues of an oil)	1	0.5
121	Karl-fischer titrator (To measure the amount of water in a sample)	1	6.5
122	Automatic closed and pour point apparatus (To determine of cloud point temperature and pour point temperature of a petroleum fraction)	1	1.05
123	Portable gas analyzer for CH4, CO2 and H2S	1	0.6
124	Copper corrosion test bath (To ensure that a grease will protect the metal	1	0.66

	surfaces it comes in contact with over time)		
125	Soxhelt Extractions Units (To determine fats and residues in oil and oilseeds)	1	0.6
126	Kjeldahl Apparatus (To determine organic nitrogen and protein contents in chemical substance)	1	0.17
127	Iodine value analyzer (To measures the degree of unsaturation in vegetable oils)	1	1.25
128	Distillation Apparatus (For facilitating the separation of substances from a liquid mixture through boiling and condensation)	1	1.7
129	Oxidation Stability Test Apparatus	1	5.15
130	FTIR (To determine various spectroscopic paramters and functional groups of organic samples)	1	8
131	Upgradation of gas chromatography (To analyse biogas, enriched biogas and biodiesel)	1	6
132	Tube furnace (For heating biomass in varied atmosphere to obtain desirable properties in terms of calorific value, chemical composition)	1	3
133	CHNS analyser (To determine Carbon, Hydrogen, Nitrogen and Sulphur content of biomass/organic compound)	1	7

Note:

- The above procurement plan is dynamic and could be revised as often as may be necessary with the approval of the Competent Authority.
- The procurement of the chemicals & consumables would be based on the need and ongoing requirement of R&D activities of Lab/Instt.
- The procurement is subject to the fund's availability/release of sufficient grant from CSIR / funding agency.
- The indicated procurement value is an estimate only.