

**Summary Sheet for Tool Room Machineries & Equipments**

Sl. No.	Name of Machineries	Qty. (Nos.)
1	Horizontal Milling Machine	1
2	Universal Milling Machine	2
3	Vertical Milling Machine	3
4	Shaping Machine	3
5	Power Hacksaw	2
6	Conventional Lathe Machine	6
7	Surface Grinding Machine	3
8	Cylindrical Grinding Machine	3
9	Pantograph Engraving Machine	1
10	Tool & Cutter Grinding Machine	1
11	Pedestal Grinding Machine	4
12	Pillar Type Drilling Machine	2
13	Radial Drilling Machine	2
14	CNC Lathe	2
15	CNC Milling Machine	2
16	CNC EDM Machine	1
17	CNC Wirecut EDM	1
18	CNC Lathe programing Simulator software	10
19	CNC Milling programing Simulator software	10



## Technical Specifications for Tool Room Machinery

1		Horizontal Milling Machine	Qty: 01 no.
1	Make		Bidder to specify
2	Model		Bidder to specify
3	<b>Axis Travel</b>		
3.1	X-Axis (mm)		700-800
3.2	Y-Axis (mm)		200-300
3.3	Z-Axis (mm)		300-400
4	<b>Table</b>		
4.1	Length (mm)		1200-1600
4.2	Width (mm)		300-400
4.3	T-Slot Width (mm)		14-16
4.4	Number of Std T-Slots		3 or more
5	<b>Feed</b>		
5.1	Motor (KW)		1.5 or better
5.2	Cutting Feed (RPM)		1200 or better
6	<b>Spindle</b>		
6.1	Rating (KW)		Bidder to specify
6.2	Max. Speed (rpm)		8000 or better
6.3	Taper		BT40
7.1	Vertical Milling Attachment		Bidder to specify
7.2	Max weight on table		300 kgs
8	<b>Essential Accessories</b>		
8.1	Machine Lamp	Bidder to specify	
8.2	Tools Kit		
8.3	Coolant pump		
8.4	One set of manual		
8.5	Clamping Kit		
8.6	Anti-vibration pad		
9	<b>General features :</b>		
9.1	The specification of feed drive motors with make, model no., Max. nominal torque.	Bidder to specify the features of the machine	
9.2	Preferably the guideways of all axes should have telescopic type protective covers with adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more.		
9.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal. It should Have independent main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.		
9.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper .		
10	<b>Any Others Aecessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.	

11	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details.</p>
		<p>Authorization Letter from OEM</p>
		<p>List of clients in last five years to be provided.</p>
12	<b>Scope of supply</b>	<p>Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.</p>

1	Make		Bidder to specify
2	Model		Bidder to specify
3	<b>Axis Travel</b>		
3.1	X-Axis (mm)		400-500
3.2	Y-Axis (mm)		500-600
3.3	Z-Axis (mm)		200-400
4	<b>Table</b>		
4.1	Length (mm)		1000-1200
4.2	Width (mm)		200-300
4.3	T-Slot Width (mm)		14-16
4.4	Number of Std T-Slots		3 or more
5	<b>Feed</b>		
5.1	Motor (H.P.)		2 or better
5.2	Cutting Feed (RPM)		2000 or better
6	<b>Spindle</b>		
6.1	Rating (KW)		Bidder to specify
6.2	Max. Speed (rpm)		4000 or better
6.3	Taper		Bidder to specify
7.1	Vertical Milling Attachment		Bidder to specify
7.2	Max weight on table		400 kgs
8	<b>Essential Accessories</b>		
8.1	Machine Lamp	Bidder to specify	
8.2	Tools Kit		
8.3	Coolant pump		
8.4	One set of manual		
8.5	Clamping Kit		
8.6	Anti-vibration pad		
9	<b>General features :</b>		
9.1	The specification of feed drive motors with make, model no., Max. nominal torque.	Bidder to specify the features of the machine	
9.2	Preferably the guideways of all axes should have telescopic type protective covers with adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more.		
9.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal. It should Have independent main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.		

9.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper .	Bidder to specify the features of the machine
10	<b>Any Others Acessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.
11	<b>Terms &amp; Conditions</b>	Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details
		Authorization Letter from OEM
		List of clients in last five years to be provided.
12	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard acessories, Optional Acessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

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## Vertical Milling Machine

Qty: 03 Nos.

1	Make		Bidder to specify
2	Model		Bidder to specify
3	<b>Axis Travel</b>		
3.1	X-Axis (mm)		700-800
3.2	Y-Axis (mm)		300-400
3.3	Z-Axis (mm)		400-500
4	<b>Table</b>		
4.1	Length (mm)		1000-1200
4.2	Width (mm)		200-300
4.3	T-Slot Width (mm)		14-16
4.4	Number of Std T-Slots		5 or better
5	<b>Feed</b>		
5.1	Motor (H.P.)		5 or better
5.2	Cutting Feed (RPM)		4000 or better
6	<b>Spindle</b>		
6.1	Rating (KW)		Bidder to specify
6.2	Max. Speed		8000 or better
6.3	Taper		Bidder to specify
7.1	Vertical Milling Attachment		Bidder to specify
7.2	Max weight on table		400 kgs
8	<b>Essential Accessories</b>		
8.1	Machine Lamp	Bidder to specify	
8.2	Tools Kit		
8.3	Coolant pump		
8.4	One set of manual		
8.5	Clamping Kit		
8.6	Anti-vibration pad		
9	<b>General features :</b>		
9.1	The specification of feed drive motors with make, model no., Max. nominal torque.	Bidder to specify the features of the machine	
9.2	Preferably the guideways of all axes should have telescopic type protective covers adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more.		
9.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal. It should have main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.		

9.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper.	Bidder to specify the features of the machine
10	<b>Any Others Aecessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.
11	<b>Terms &amp; Conditions</b>	Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details
		Authorization Letter from OEM
		List of clients in last five years to be provided.
12	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard aecessories, Optional Aecessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

	Model		Bidder to specify
	Make		Bidder to specify
1	<b>Capacity</b>		
1.1	Length of ram stroke (mm)		600-800
1.2	Length of ram (mm)		1200-2400
1.3	Length X width of ram bearing (mm)		900-1000 X 200-300
1.4	Max / min distance from table to ram (mm)		450 -500 / 100-150
2	<b>Table</b>		
2.1	Working surface of table (mm)		500-700X 300-400
2.2	Horizontal table travel max (mm)		600 or better
2.3	Max vertical table travel (mm)		400 or better
2.4	Angular movement of table(degree)		±60
3	<b>Tool Head</b>		
3.1	Max tool shank size (mm)		35 -40 X 20-25
3.2	Max vertical travel of tool slide (mm)		150 or better
3.3	Max swivel tool head (degree)		±60
4	<b>Speed and Feed</b>		
4.1	Number of ram speed / stroke (no's)		4 or better
4.2	Range of ram stroke ( per minute)		10-80
4.3	Range of table feed per stroke		0.2 to 0.9
5	<b>Electric equipment</b>		
5.1	Main motor		3 HP or better
5.2	V belt section		Bidder to specify
5.3	Motor starter		5 amp or better
6	<b>Essential Accessories</b>		
6.1	Machine Lamp		Bidder to specify
6.2	Tools Kit		
6.3	Coolant pump		
6.4	One set of manual		
6.5	Clamping Kit		
6.6	Anti-vibration pad		
7	<b>Any Others Accessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.	
8	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>	
9	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.	

	Model		Bidder to specify
	Make		Bidder to specify
1	<b>Capacity</b>		
1.1	Cutting range (mm) Round		Dia. 250.
1.2	Cutting range – flat (mm)		250 x 150 or better
1.3	Square plate (mm)		200 x 200 or better
1.4	No of speeds		5 or more
1.5	Saw blade size (mm) L x W x T		400 – 500 x 35 – 40 x 2.
2	<b>Essential Accessories</b>		
2.1	Machine Lamp	Bidder to specify	
2.2	Tools Kit		
2.3	Coolant pump		
2.4	One set of manual		
2.5	Clamping Kit		
2.6	Anti-vibration pad		
3	<b>Any Others Accessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.	
4	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>	
5	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.	

	Model		Bidder to specify
	Make		Bidder to specify
1	Height of the Center	mm	100-150
2	Centre distance	mm	500-600
3	Maximum Swing over bed	mm	350-450
4	Swing over cross slide	mm	150-200
5	<b>Carriage</b>		
5.1	Cross slide travel	mm	80-100
5.2	Dial Graduation of Cross slide	mm	0.05
5.3	Top slide travel	mm	100-150
5.4	Dial Graduation of Top slide	mm	0.05
5.5	Angular Swivel graduation	degree	45 (Plus & Minus)
5.6	Maximum Tool Section	mm	16x16
6	<b>Tailstock</b>		
6.1	Spindle travel	mm	100-150
6.2	Spindle dia.	mm	55
6.3	Taper in spindle		MT3
6.4	Scale of Spindle graduation	mm	1
6.5	Hand wheel dia graduation	mm	0.05
6.6	Set-over adjustments	degree	45
7	<b>Spindle</b>		
7.1	Spindle bore dia.	mm	45-50
7.2	Collect capacity	mm	26
7.3	Spindle Power	Kw	Minimum 3KW
7.4	Spindle speed	rpm	50-3000 or better
8	<b>Feeds &amp; Threads</b>		
8.1	Longitudinal feeds	mm/ min/ mm/ rev	24/0.03-0.7
8.2	Cross feeds	mm/ min/ mm/ rev	24/0.015-0.35
8.3	Metric threads	mm	32/0.15-0.35
8.4	US & Whitworth threads	TPI	60/56-1
8.5	Module threads	mm	40/0.25 to 14
9	<b>Accessories</b>		
9.1	Ø160 mm x 3jaw self center chuck	Set of accessories suitable to the machine	
9.2	Four Jaw chuck (ø 160 mm) with Adapter		
9.3	MT5 – MT3 center sleeve		
9.4	MT3 – male center		
9.5	Quick change tool post		
9.6	Electric coolant system splash guard		
9.7	4 way Tool post		
9.8	5c Quick acting collet attachment		
9.9	Hand wheel type collet attachment		
9.10	Set of collets -size 5 mm to 20 mm - step of 1 mm		
9.11	Collet Holders		
9.12	Dog carriers dia. 20 mm, dia. 30 mm		

9.13	Splash Guards	Set of accessories suitable to the machine	
9.14	Revolving Center		
9.15	Drill Chuck		
9.16	Reduction sleeve- MT3-MT2, MT2-MT1		
9.17	Fixed & Traveling steady rest		
9.18	Extra change gears for inches, module & DP threads		
9.19	Face plate(200mm)		
9.20	Driver plate		
9.21	Service tools		
9.22	Machine Lamp		
9.23	Live & Dead Center		
9.24	Foot Brake		
9.25	Chuck guard		
9.26	Tools kit		
9.27	One set of manuals		
9.28	Coolant Pump (0.25 - 0.5 HP)		
9.29	Anti vibration pads		
10	Taper turning attachment		Bidder to Specify
11	<b>General features :</b>		Bidder to specify the features of the machine
11.1	The specification of feed drive motors with make, model no., Max. nominal torque.		
11.2	Preferably the guideways of all axes should have telescopic type protective covers adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more		
11.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal.It should have main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.		
11.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper.		
12	<b>Any Others Aecessories</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.	
13	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>	

14	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.
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## 6.B

## Conventional Lathe Machine (II)

Qty: 02 Nos.

1	Height of the Center	mm	300-350
2	Centre distance	mm	2500-3500
3	Maximum Swing over bed	mm	550-650
4	Swing over cross slide	mm	350-450
5	<b>Carriage</b>		
5.1	Cross slide travel	mm	300-500
5.2	Dial Graduation of Cross slide	mm	0.05
5.3	Top slide travel	mm	200-300
5.4	Dial Graduation of Top slide	mm	0.05
5.5	Angular Swivel graduation	degree	±45
5.6	Maximum Tool Section	mm	16x16
6	<b>Tailstock</b>		
6.1	Spindle travel	mm	150-250
6.2	Spindle dia.	mm	60-70
6.3	Taper in spindle		MT3
6.4	Scale of Spindle graduation	mm	1
6.5	Hand wheel dia graduation	mm	0.05
6.6	Set-over adjustments	degree	45
7	<b>Spindle</b>		
7.1	Spindle bore dia.	mm	60-80
7.2	Collect capacity	mm	32
7.3	Spindle Power	Kw	10 or better
7.4	Spindle speed	rpm	50-3000 or better
8	<b>Feeds &amp; Threads</b>		
8.1	Longitudinal feeds	mm/ min/ mm/ rev	60 /0.04-2.24
8.2	Cross feeds	mm/ min/ mm/ rev	60/0.2-1.12
8.3	Metric threads	mm	48/0.15-30
8.4	US & Whitworth threads	TPI	60/56-1
8.5	Module threads	mm	40/0.25 to 14
9	<b>Accessories</b>		
9.1	Ø160 mm x 3jaw self center chuck	Set of accessories suitable to the machine	
9.2	Four Jaw chuck (ø 160 mm) with Adapter		
9.3	MT5 – MT3 center sleeve		
9.4	MT3 – male center		
9.5	Quick change tool post		
9.6	Electric coolant system splash guard		
9.7	4 way Tool post		
9.8	5c Quick acting collet attachment		
9.9	Hand wheel type collet		
9.10	Set of collets -size 5 mm to 20 mm - step of 1 mm		
9.11	Collet Holders		
9.12	Dog carriers dia. 20 mm, dia. 30 mm		
9.13	Splash Guards		
9.14	Revolving Center		
9.15	Drill Chuck		
9.16	Reduction sleeve- MT3-MT2, MT2-MT1		

9.17	Fixed & Traveling steady rest	Set of accessories suitable to the machine
9.18	Extra change gears for inches, module & DP threads	
9.19	Face plate(200mm)	
9.20	Driver plate	
9.21	Service tools	
9.22	Machine Lamp	
9.23	Live & Dead Center	
9.24	Foot Brake	
9.25	Chuck guard	
9.26	Tools kit	
9.27	One set of manuals	
9.28	Coolant Pump (0.25 - 0.5 HP)	
9.29	Anti vibration pads	
10	<b>OTHERS</b>	
11	<b>General features :</b>	
11.1	The specification of feed drive motors with make, model no., Max. nominal torque.	Bidder to specify the features of the machine
11.2	Preferably the guideways of all axes should have telescopic type protective covers adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more	
11.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal.It should have main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.	
11.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper.	
12	<b>Any Others Acessories</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.
13	<b>Terms &amp; Conditions</b>	Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details
		Equipment should be CE certified
		Authorization Letter from OEM
		List of clients in last five years to be provided.
14	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard aecessories, Optional Aecessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

	Make:	Bidder to specify	
	Model:	Bidder to specify	
1	Working Area	mm	(500-600) x (200 – 300)
2	Longitudinal Travel	mm	500-600
3	Cross travel	mm	200-300
4	Height of the Table to grinding wheel	mm	400-600
5	Spindle Speed	rpm	2500-4000
6	Cross feed, Vertical Feed graduation	mm	0.001 or better
7	Table traverse Feed Range	m/min	1.5-15 or better
8	Max. Vertical traverse of wheel head spindle from the table	mm	400-600
9	Cross feed of the table / Auto feed with micrometer	mm/ Stroke	0.5-10
10	Size of grinding wheel (dia x width x bore)	mm	250 -400 x 25 -50 x 76 -127 or equivalent
11	Wheel Head motor & Hydraulic Pump Motor	KW	3-4 & 2-3
12	<b>Essential Accessories</b>		
12.1	Complete electrical with motor & starter	Bidder should quote and supply well known branded with make, model and major specification	
12.2	Permanent Magnetic Chuck		
12.3	Diamond Tool with holder		
12.4	Coolant equipment with splash guard		
12.5	Wheel Balancing stand with mandrel		
12.6	Wheel guard		
12.7	Wheel adaptor puller		
12.8	Grinding wheel (Al <sub>2</sub> O <sub>3</sub> ) – 04 Nos.		
12.9	One set of Service Tools, Keys, Oil can, spanners		
12.10	Anti Vibration Pads		
12.11	Machine Lamp		
12.12	One set of manuals		
13	<b>Others</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.	
14	<b>Terms &amp; Conditions</b>	<p>The bidder must have supplied machines at other institutes in the past ( a satisfactory performance certificate from those user may be solicited if needed). Bidder should submit complete contact details.</p> <p>Manufacture of the supplied equipment must be ISO Certified.</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p> <p>Manufacture/Supplier should have sizable installation of same model worldwide and at least five in India</p>	
15	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.	

1	Type	mm	Hydraulic
2	Centre Height	mm	200-300
3	Grinding details		
3.1	Max. Grinding Diameter	mm	200-300
3.2	Max. Grinding Length	mm	1800
3.3	Max. Grinding Diameter (Internal)	mm	5-200
4	Admit between Centre	mm	Minimum 1000
5	Table Speed Min./Max	mm/ min	100 / 4000 or better
6	Table Swivel	degree	± (5 – 15)
<b>7</b>	<b>Work Head and Tail Stock</b>		
7.1	Speed of work head spindle	rpm	25-350
7.2	Morse taper in work head		Specify
7.3	Swivel of work head	degree	± (30- 45)
7.4	Morse taper in tail stock		Bidder to Specify
<b>8</b>	<b>Wheel Head and Wheel speed</b>		
8.1	Grinding Wheel diameter	mm	500
8.2	Grinding Wheel width	mm	40-80
8.3	Grinding Wheel Bore	mm	76.2-127
8.4	Speed of the Grinding Wheel	rpm	2000 – 3000or better
<b>9</b>	<b>Internal Grinding Attachment</b>		
9.1	Grinding Spindle Diameter		60
9.2	Max. Quill length		81
9.3	Quill Diameter		15
9.4	Min. & Max. dia. of hole grinding		16-150
9.5	Spindle Speed		8000 or better
<b>10</b>	<b>Electrical Motors</b>		
10.1	Wheel head motor	HP	Bidder to specify and quote required for smooth running of the machine
10.2	Work Head Motor	HP	
10.3	Hydraulic pump motor	HP	
10.4	Coolant pump motor	HP	
10.5	Internal grinding Attachment motor	HP	
<b>11</b>	<b>Accessories:</b>		
11.1	Motors electrical panel, pump are fitted on the machine, Poly V-belt, coolant tankwith piping, Grinding wheelwith one flange, 2 dead centres, True Chuck Flange, Two Point Steady Rest., Three Point Steady Rest., set of Oil seals		Set of accessories suitable to the machine
11.2	Three Jaw chuck (ø150mm)		
11.3	Four Jaw Chuck (ø 150mm)		
11.4	Dogs & Carriers (5 – 30 mm)		
11.5	Internal grinding Attachment		
11.6	Machine Lamp		
11.7	Diamond Tool with holder		
11.8	Coolant splash guard		
11.9	Wheel balancing stand		
11.10	wheel Puller with extracting nut		
11.11	Wheel guard		
11.12	One set of manuals		
11.13	One set of Service Tools, Keys, allen keys, Spanner		

11.14	Grinding wheel (Al <sub>2</sub> O <sub>3</sub> ) / SiC – 02 Nos.	Set of accessories suitable to the machine
11.15	Anti vibration Pads	
<b>12</b>	<b>Others</b>	Bidder to specify and quote if any other accessories available.
<b>13</b>	<b>General features :</b>	
13.1	The specification of feed drive motors with make, model no., Max. nominal torque.	Bidder to specify the features of the machine
13.2	Preferably the guideways of all axes should have telescopic type protective covers adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more	
13.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal.It should have main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.	
13.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper.	
14	Any Others Aecessories	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.
<b>15</b>	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details.</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>
<b>16</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard aecessories, Optional Aecessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

	Model		Bidder to specify
	Make		Bidder to specify
1	<b>Capacity</b>		
1.1	Clamping area (mm)		500x300
1.2	Drive motor		0.5HP or better
1.3	Speed range		6000-18000 rpm
1.4	No of speeds		5 or more
1.5	Cross travels		3 or better
1.6	Vertical travels		6 or better
1.7	Spindle hole taper (degree)		20 or better
1.8	Max collet capacity (mm)		10
1.9	Pantograph ratio		1:1-1:50 (18 or more range)
2	<b>Work table</b>		
2.1	Longitudinal travels (mm)		300 or better
2.2	Cross travel (mm)		200 or better
2.3	Vertical distance		300 or better
2.4	T slots on table		3 or better
3	<b>Essential Accessories</b>		
3.1	Machine Lamp		Set of accessories suitable to the machine
3.2	Tools Kit		
3.3	One set of manual		
3.4	Clamping Kit		
3.5	Anti-vibration pad		
4	<b>Any Others Accessories</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.	
5	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>	
6	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.	

1	Centre height	mm	120-150
2	Swing Diameter	mm	250 - 300
3	Swing with raising block	mm	350 - 400
4	Distance between tailstock centres	mm	700- 800
5	Distance between work head & tailstock centre	mm	600 - 650
<b>6</b>	<b>Table</b>		
6.1	Longitudinal travel	mm	500 - 600
6.2	Clamping area	mm	(900 - 1000) x (100 - 200)
6.3	Cross traverse	mm	250 - 300
6.4	Swivel of the table with centre locking	deg.	Plus / Minus 45
6.5	Fine Swivel with end locking	deg.	Plus / Minus 9
<b>7</b>	<b>Tilting Wheel Head</b>		
7.1	Eccentricity with central line of	mm	40
7.2	Vertical adjustment	mm	250-300
7.3	Spindle Axis		
7.4	Above the axis of centres	mm	200-230
7.5	Below the axis of centres	mm	60-80
<b>8</b>	<b>Swivel</b>		
8.1	Vertical plane	deg.	Plus / Minus 20 - 25
8.2	Horizontal plane	deg.	360
8.3	Wheel speed in either sense of rotation	rpm	2800 / 5600 or better
8.4	Motor Power	kW	0.75 or better
<b>9</b>	<b>Work Head</b>		
9.1	Spindle bore taper		MT5
<b>10</b>	<b>Tail stock taper</b>		
			MT2
<b>11</b>	<b>Internal Grinding</b>		
11.1	Dia. Range Min. / Max	mm	14 / 56
11.2	Max. Spindle speed	rpm	18000 - 25000 or better
12	Total power	kW	3
<b>13</b>	<b>Accessories:</b>		
13.1	Cylindrical grinding attachment		Set of accessories suitable to the machine
13.2	Internal grinding attachment surface		
13.3	Universal vice for surface grinding		
13.4	Radius grinding attachment		
13.5	Radius truing attachment		
13.6	Hydraulic equipment for table movement		
13.7	Fine cross feed attachment		
13.8	PTFE coated guide way for cross movement		
13.9	Taper relief grinding attachment		
13.10	Rough reamer / core drills relief grinding attachment		
13.11	Attachment for grinding and relief of disc cutter		
13.12	Spiral milling and hob grinding attachment		
13.13	Twist drill sharpening attachment		
13.14	Permanent magnetic chuck		
13.15	Dust Exhausting device		
13.16	Water cooling device		
13.17	3-Jaw chuck		
13.18	Indexing unit		
13.19	Collet chucking attachment		

13.20	Attachmentfor grinding carbide tip tools	Set of accessories suitable to the machine
13.21	Precision radius grinding	
13.22	DRO for all slides with display unit	
13.23	Grinding wheel guards	
13.24	Grinding wheel flanges (different sizes)	
13.25	Machine Lamp	
13.26	Diamond Tool with holder	
13.27	One set of manuals	
13.28	One set of Service Tools	
13.29	Different Grinding wheel (Cup, saucer, taper, straight etc.)	
13.30	Anti vibration pads	
14	Others	Bidder to specify and quote if any other accessories available /required for smooth running of the machine
15	<b>General features :</b>	
15.1	The specification of feed drive motors with make, model no., max. & nominal torque	Bidder to specify the features of the machine
15.2	Preferably the guideways of all axes should have telescopic type protective covers adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more	
15.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal.It should have main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.	
15.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper.	Bidder to specify the features of the machine
16	<b>Any Others Acessories</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.
17	<b>Terms &amp; Conditions</b>	Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Equipment should be CE certified Authorization Letter from OEM List of clients in last five years to be provided.
18	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Acessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

	Model		Bidder to specify
	Make		Bidder to specify
<b>1</b>	<b>Capacity</b>		
1.1	Grinding wheel size (mm)		Ø250- Ø 350
1.2	Wheel width (mm)		25 -50
1.3	Bore (mm)		25 - 40
1.4	Centre distance (mm)		600-650
<b>2</b>	<b>Spindle</b>		
2.1	Centre height (mm)		850-950
2.2	R.P.M		1000-3000
<b>3</b>	<b>Motor (H.P)</b>		1-2
<b>4</b>	<b>Any Others Acessories</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.	
<b>5</b>	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>	
<b>6</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard aecessories, Optional Aecessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.	

	Model		Bidder to specify
	Make		Bidder to specify
<b>1</b>	<b>Capacity</b>		
1.1	Drilling capacity	mm	
1.2	Tapping capacity	mm	12
1.3	Spindle travels	mm	120 or better
1.4	Spindle nose taper		Bidder to specify
1.5	No of spindle speed		8 or better
1.6	Range of spindle speed	rpm	80-4000
1.7	max spindle nose to working table	mm	600 or better
1.8	Max spindle nose to base plate	mm	800 or better
1.9	Pillar height	mm	1000 or better
1.1	Pillar diameter	mm	Dia 70 or better
1.11	Size of v belt		Bidder to specify
1.12	Electric motor		1.0 H.P. or better
1.13	Min Size of working table	mm	250x250
<b>2</b>	<b>Essential Accessories</b>		
2.1	3 phase electric motor		
2.2	V belt		
2.3	switch		
2.4	Motor pulley		
2.5	Drill drift key		
2.6	Arbour		Bidder to specify
<b>3</b>	<b>Any Others Accessories</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine.	
<b>4</b>	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>	
<b>5</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.	

1	Max. Drilling Capacity	mm	50-60
2	Drilling Radius Max./ Min.	mm	(1200-1500) / (450- 600)
3	Vertical Traverse of Arm	mm	1000-1200
4	Horizontal Movement of Drill Head	mm	800-1000
5	Column Diameter		200-400
6	Cross travel	mm	1000-1200
7	Morse Taper in Spindle	mm	MT-5
8	Number of Speeds		12
9	Range of Speed	RPM	40-1800
10	Angle of Arm Rotation	Degree	360
11	Angle of Drill Head Rotation	Degree	360
12	Base working surface	mm	(1200- 1500 ) x (800-1000)
13	Spindle Travel	mm	200-400
14	Motor	HP	2.25 HP or better
15	Feed		Manual & Auto feed Both type
16	<b>Accessories</b>		
16.1	Box Shape Worktable	Set of accessories suitable to the machine	
16.2	Machine Vise 8"		
16.3	Taper / Reduction sleeves		
16.4	Quick Change Drill Chuck		
16.5	Coolant Equipment		
16.6	Machine Lamp		
16.7	Drifts		
16.8	One set of manuals		
16.9	One set of Service Tools,Keys		
17	<b>Others</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the machine	
18	<b>General features :</b>		
18.1	The specification of feed drive motors with make, model no., Max. nominal torque.	Bidder to specify the features of the machine	
18.2	Preferably the guideways of all axes should have telescopic type protective covers with adequate sealing on joints to prevent seepage of dust & coolant oil inside. Guide ways should be of hardened steel with hardness HRC60 or more.		
18.3	The machine must have rigid streamlined and vibration free construction. All gears must be case hardened and ground and all the slides should be rigid to withstand heavy stock removal. It should have independent main drive and feed drive motors. Anti-vibration pad is to be provided for each leg of the machine.		
18.4	Each axis should have electrical limit switches interlocked with feed/rapid drive as well as mechanical stopper .		

19	<b>Any Others Acessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.
20	<b>Terms &amp; Conditions</b>	<p data-bbox="662 191 1482 365">Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p data-bbox="662 373 1482 415">Equipment should be CE certified</p> <p data-bbox="662 424 1482 466">Authorization Letter from OEM</p> <p data-bbox="662 474 1482 495">List of clients in last five years to be provided.</p>
21	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard acessories, Optional Acessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

	Make		Bidder to specify
	Model		Bidder to specify
<b>1</b>	<b>Capacity</b>		
1.1	Swing over bed	mm	450-550
1.2	Swing over carriage	mm	200-300
1.3	Max. turning diameter	mm	250-300
1.4	Max. turning length	mm	400-500
1.5	Distance between centres	mm	500-600
<b>2</b>	<b>Travel</b>		
2.1	X-Axis Travel (Cross)	mm	150-200
2.2	Z-Axis Travel (Longitudinal)	mm	400-450
<b>3</b>	<b>Main Spindle</b>		
3.1	Spindle motor Power	KW	7.5 or better
3.2	Max. Speed	rpm	4000 or better
3.3	Spindle Bore	mm	50-60
3.4	Spindle Nose		A2-6
<b>4</b>	<b>Feed Rate</b>		
4.1	Rapid Traverse X axis	mts./min	20 or better
4.2	Rapid Traverse Z axis	mts./min	20 or better
4.3	Feed Rate	mm/min	5000 or better
<b>5</b>	<b>Turret</b>		
5.1	No. of station	Nos.	8 or better
5.2	Tool shank size	mm	20x20 or better
5.3	Boring bar dia.	mm	32 or better
5.4	Turret indexing		Bi Directional
<b>6</b>	<b>Tailstock</b>		
6.1	Quill dia	mm	60-80
6.2	Quill stroke	mm	100-120
6.3	Quill taper	-	MT4 or better
<b>7</b>	<b>CNC System</b>		
7.1	Controller		Siemens/Fanuc (Latest with complete module)
7.2	Part Program Storage	GB	"Bidder to specify"
7.3	Programming Functions with editor		Complete module
<b>8</b>	<b>Accuracy</b>		
8.1	Positioning uncertainty	µm	5
8.2	Overall Axis Repeatability (X,Z)	µm	5
8.3	Part Surface Finish	µm	5
8.4	Roundness	µm	5
8.5	Turret Indexing Repeatability	µm	5
<b>9</b>	<b>Essential Accessories</b>		
9.1	Programmable Tailstock with	one	
9.2	Automatic Tool setter	one	
9.3	Hydraulic 3 Jaw Chuck	Max. turning diameter of the quoted machine	
9.4	Hydraulic 4 Jaw Chuck	Max. turning diameter of the quoted machine	
9.5	Soft Jaws	two sets	
9.6	Drill Chuck	25 mm	
9.7	Hydraulic Collet chuck with set of collets	Size: 26 mm; set of collets upto 25 mm	
9.8	Set of standard Cutting Tools with holder for replaceable inserts (for Facing,Turning, boring, threading, grooving, parting, drilling etc)	Various operation suitable various size of jobs each one No. Drills-Centre Drill and 1to 20 mm drills	
9.9	Coolant System	Bidder to specify and quote suitable for the machine	

9.10	Start up Tool kit	Bidder to specify and quote suitable for the machine
9.11	Foot switch	
9.12	Work light	
9.13	Centralized lub. System	
9.14	Set of Rubber mounts	
9.15	Voltage Stabilizer	
9.16	Ultra Isolation transformer	
9.17	Others	Ethernet, USB ports, RS-232C Communication Ports, Set of manual (or) CD
<b>10</b>	<b>Any Others Aecessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.
<b>11</b>	<b>Terms &amp; Conditions</b>	Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performancecertificate from two institutions to be provided for eligibility. Bidder should submit complete contact details
		Equipment should be CE certified
		Authorization Letter from OEM
		List of clients in last five years to be provided.
<b>12</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard aecessories, Optional Aecessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

	Make		Bidder to specify
	Model		Bidder to specify
<b>1</b>	<b>Capacity</b>		
1.1	Swing over bed	mm	500-600
1.2	Swing over carriage	mm	300-400
1.3	Max. turning diameter	mm	400-500
1.4	Max. turning length	mm	1000-1500
1.5	Distance between centres	mm	1400-1600
<b>2</b>	<b>Travel</b>		
2.1	X-Axis Travel (Cross)	mm	200-300
2.2	Z-Axis Travel (Longitudinal)	mm	1400-1600
<b>3</b>	<b>Main Spindle</b>		
3.1	Spindle motor Power	KW	20 or better
3.2	Max. Speed	rpm	3000 or better
3.3	Spindle Bore	mm	Bidder to specify
3.4	Spindle Nose		A2-8 or better
<b>4</b>	<b>Feed Rate</b>		
4.1	Rapid Traverse X axis	mts./min	15 or better
4.2	Rapid Traverse Z axis	mts./min	15 or better
4.3	Feed Rate	mm/min	4000 or better
<b>5</b>	<b>Turret</b>		
5.1	No. of station	Nos.	8 or better
5.2	Tool shank size	mm	25x25 or better
5.3	Boring bar dia.	mm	40 or better
5.4	Turret indexing		Bi Directional
<b>6</b>	<b>Tailstock</b>		
6.1	Quill dia	mm	80-120
6.2	Quill stroke	mm	Bidder to specify
6.3	Quill taper	-	MT5 or better
<b>7</b>	<b>CNC System</b>		
7.1	Controller		Siemens/Fanuc (Latest with complete module)
7.2	Part Program Storage	GB	Bidder to specify
7.3	Programming Functions with editor		Complete module
<b>8</b>	<b>Accuracy</b>		
8.1	Positioning uncertainty	µm	5
8.2	Overall Axis Repeatability (X,Z)	µm	5
8.3	Part Surface Finish	µm	5
8.4	Roundness	µm	5
8.5	Turret Indexing Repeatability	µm	5
<b>9</b>	<b>Essential Accessories</b>		
9.1	Programmable Tailstock with sleeves	One No.	
9.2	Automatic Tool setter	One No.	
9.3	Hydraulic 3 Jaw Chuck	Max. turning diameter of the quoted machine	
9.4	Hydraulic 4 Jaw Chuck	Max. turning diameter of the quoted machine	
9.5	Soft Jaws	Two sets	
9.6	Drill Chuck	25 mm	
9.7	Hydraulic Collet chuck with set of collets	Size: 26 mm; set of collets upto 25 mm	
9.8	Set of standard Cutting Tools with holder for replaceable inserts (for Facing Turning, boring, threading, grooving, parting, drilling etc)	Various operation suitable various size of jobs each one No. Drills-Centre Drill and 1to 20 mm drills	

9.9	Coolant System	Bidder to specify and quote suitable for the machine
9.10	Start up Tool kit	
9.11	Foot switch	
9.12	Work light	
9.13	Centralized lub. System	
9.14	Set of Rubber mounts	
9.15	Voltage Stabilizer	
9.16	Ultra Isolation transformer	
9.17	Others	Ethernet, USB ports, RS-232C Communication Ports, Set of manual (or) CD
<b>10</b>	<b>Any Others Acessories</b>	Bidder to specify and quote if any other accessories available/required for smooth running of the machine.
<b>11</b>	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details.</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>
<b>12</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

## 15. A

## CNC Milling Machine – I

Qty. 01 no.

1	Make		Bidder to specify
2	Model		Bidder to specify
<b>3</b>	<b>Axis Travel</b>		
3.1	X-Axis (mm)		400-500
3.2	Y-Axis (mm)		300-400
3.3	Z-Axis (mm)		250-300
<b>4</b>	<b>Table</b>		
4.1	Length (mm)		800-1000
4.2	Width (mm)		300-400
4.3	T-Slot Width (mm)		14-16
4.4	Number of Std T-Slots		3 or more
<b>5</b>	<b>Feed</b>		
5.1	Rapid Feed (X, Y,Z Axes) (m/min)		15 or better
5.2	Max. Cutting Feed (X, Y,Z Axes) (m/min)		12 or better
<b>6</b>	<b>Spindle</b>		
6.1	Rating (KW)		Bidder to specify
6.2	Max. Speed (rpm)		6000 or better
6.3	Taper		BT40
<b>7</b>	<b>Accuracy</b>		
7.1	Positioning (µm)		10 or better
7.2	Repeatability (µm)		5 or better
<b>8</b>	<b>Automatic Tool Changer</b>		
8.1	Magazine capacity (Nos)		10 or better
8.2	Tool select by shortest & random select		Bi-Directional
8.3	Max. tool diameter (mm)		80 or better
<b>9</b>	<b>Control System</b>		
9.1	Controller	Fanuc / Siemens /or equivalent (Latest with complete module) with the screen size of 19" or more with touch screen technology, app based which leads to a smart paperless shop floor management and monitoring.	
9.2	Part Program Storage(GB)	Capable to store large CAM programs for continuous running (Minimum 4 GB)	
9.3	Programming Functions with editor	Complete Module with technical calculator for power and torque requirements , with dxf file import facility, 3D simulation	
<b>10</b>	<b>Essential Accessories</b>		
10.1	Servo stabilizer	Bidder to specify and quote suitable for the machine	
10.2	Ultra Isolation transformer		
10.3	Air Compressor with drier and multi dry filter		
10.4	Automatic centralized lubrication system		
10.5	Touch Probe	Bidder to specify and quote Branded quality(Renishaw /Blum) Touch Probe	
10.6	Machine protection	Monitoring vibration during machining to protect machine and spindle failure. User autorisation to the control system and the machine. Safety during power failure and Panel cooler for electrical cabinet. Door interlock for safety	
10.7	Industry 4.0 features leads to smart machine	Live status of important component of the machine in operation, internet based remote diagnosis of the machine like fault on the machine	
10.8	Operation hardware	Electronic handwheel, Flushing gun for internal cleaning, Coolant tank with chip conveyor	

10.9	Tool holding devices	<p>Bidder to specify and quote Set of suitable Cutting Tool holders</p> <p>ER 25 collet chuck -1 No.</p> <p>ER 25 collets Dia 3 to Dia 14 in steps of 1mm - 1 each</p> <p>ER 32 collet chuck - 1 No.</p> <p>ER 32 collets Dia 10 to Dia 20 in steps of 1mm - 1 each</p> <p>ER 40 collet chuck -1 No.</p> <p>ER 40 collets Dia 20 to Dia 25 in steps of 1mm - 1 each</p> <p>ER 25 Tap collets with square drive for M8 and M10 taps- 1 each</p> <p>ER 32 Tap collet with square drive for M12 tap-1 each</p> <p>Side lock adaptors Dia 16, 20, 25 &amp; 32 -1 each</p> <p>Keyless drill chuck 0-13mm</p> <p>Holder (adapter) for 40 mm Face mill - 1 No</p> <p>Holder (adapter) for 80 mm Face mill - 1 No</p> <p>Holder (adapter) for 125 mm Face mill - 1 No</p> <p>Holder (adapter) for 50 mm Bull - 1 No</p> <p>Tool locking device-1 No.</p> <p>Pull stud- 30 no's</p>
10.10	<b>Cutting Tools</b>	
		<p><b>Bidder to specify and quote Set of Cutting tools</b></p> <p>Face mill cutter (with replaceable inserts 20 nos.) - Dia 80 mm</p> <p>Bull nose cutter (with replaceable inserts 20 nos)- Dia 50 mm</p> <p>End Mill cutter (with replaceable inserts 20 nos)- Dia 32 mm</p> <p>Bull nose cutter (with replaceable inserts 20 nos)- Dia 25 mm</p> <p>Endmill cutter (with replaceable inserts 20 nos)- Dia 20 mm</p> <p>Endmill cutter (with replaceable inserts 20 nos)- Dia 16 mm</p> <p>Carbide End Mill cutter (each two)- Dia. 3, 4, 5, 6, 8, 10, 12, 16 mm</p> <p>Carbide Ball End Mill cutter (each two)- Dia. 3, 4, 5, 6, 8, 10,12, 16 mm</p> <p>M8, M10,M12 HSS Tap with suitable Carbide Drills - 2 Sets</p> <p>HSS Drills ( one set) - Dia. 1 to 20 mm</p> <p>Centre Drill (Carbide &amp; HSS) - each 3 Diff. Sizes</p> <p>Finish boring kit dia 10 to 40- 1 set</p>
10.11	Clamping Kit	<p><b>Clamp set</b> Precision Hydraulic Vise with jaw opening of 275 mm and clamping force 60 KN - 1 No</p> <p>3 Jaw chuck - 300 mm dia - 1 no..</p>
	Others	Ethernet, USB ports
10.12	Software & Workstation	CAM software with post processor suitable for the machine to be quoted separately with workstation
11	Any other accessories if available for better utilization	Bidder to specify and quote if any other accessories available /required for smooth running and better utilization of the machine.
12	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>
13	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

## 15.B

## CNC Milling Machine – II

Qty. 01 no.

1	Make		Bidder to specify
2	Model		Bidder to specify
<b>3</b>	<b>Axis Travel</b>		
3.1	X-Axis (mm)		800-1200
3.2	Y-Axis (mm)		600-700
3.3	Z-Axis (mm)		500-700
<b>4</b>	<b>Table</b>		
4.1	Length (mm)		1000-1300
4.2	Width (mm)		600-700
4.3	T-Slot Width (mm)		16-20
4.4	Number of Std T-Slots		5 or more
<b>5</b>	<b>Feed</b>		
5.1	Rapid Feed (X, Y,Z Axes) (m/min)		20 or better
5.2	Max. Cutting Feed (X, Y,ZAxes) (m/min)		15 or better
<b>6</b>	<b>Spindle</b>		
6.1	Rating (KW)		Bidder to specify
6.2	Max. Speed (rpm)		6000 or better
6.3	Taper		BT40
<b>7</b>	<b>Accuracy</b>		
7.1	Positioning	( $\mu$ m)	10 or better
7.2	Repeatability	( $\mu$ m)	5 or better
<b>8</b>	<b>Automatic Tool Changer</b>		
8.1	Magazine capacity (Nos)		10 or better
8.2	Tool select by shortest & Random select		Bi-Directional
8.3	Max. tool diameter (mm)		80 or better
<b>9</b>	<b>Control System</b>		
9.1	Controller	Fanuc / Siemens /or equivalent (Latest with complete module) with the screen size of 19" or more with touch screen technology, app based which leads to a smart paperless shop floor management and monitoring.	
9.2	Part Program Storage (GB)	Capable to store large CAM programs for continuous running (Minimum 4 GB)	
9.3	Programming Functions with editor	Complete Module with technical calculator for power and torque requirements , with dxf file import facility, 3D simulation	
<b>10</b>	<b>Essential Accessories</b>		
10.1	Servo stabilizer	Bidder to specify and quote suitable for the machine	
10.2	Ultra Isolation transformer		
10.3	Air Compressor with drier and multi dry filter		
10.4	Automatic centralized lubrication system		
10.5	Touch Probe	Bidder to specify and quote Branded quality (Renishaw /Blum) Touch Probe	
10.6	Machine protection	Monitoring vibration during machining to protect machine and spindle failure. User autorisation to the control system and the machine. Safety during power failure and Panel cooler for electrical cabinet. Door interlock for safety.	
10.7	Industry 4.0 features leads to smart machine	Live status of important component of the machine in operation, internet based remote diagnosis of the machine like fault on the machine.	
10.8	Operation hardware	Electronic handwheel, Flushing gun for internal cleaning, Coolant tank with chip conveyor	

10.9	Tool holding devices	<p>Bidder to specify and quote Set of suitable Cutting Tool holders</p> <p>ER 25 collet chuck -1 No.</p> <p>ER 25 collets Dia 3 to Dia 14 in steps of 1mm -1 each</p> <p>ER 32 collet chuck - 1 No.</p> <p>ER 32 collets Dia 10 to Dia 20 in steps of 1mm-1each</p> <p>ER 40 collet chuck -1 No.</p> <p>ER 40 collets Dia 20 to Dia 25 in steps of 1mm-1each</p> <p>ER 25 Tap collets with square drive for M8 and M10 taps- 1 each.</p> <p>ER 32 Tap collet with square drive for M12 tap-1each</p> <p>Side lock adaptors Dia 16, 20, 25 &amp; 32 -1 each</p> <p>Keyless drill chuck 0-13mm</p> <p>Holder (adapter) for 40 mm Face mill - 1 No</p> <p>Holder (adapter) for 80 mm Face mill - 1 No</p> <p>Holder (adapter) for 125 mm Face mill - 1 No</p> <p>Holder (adapter) for 50 mm Bull - 1 No</p> <p>Tool locking device-1 No.</p> <p>Pull stud- 30 no's</p>
10.10	Cutting Tools	<p>Bidder to specify and quote Set of suitable Cutting Tool holders</p> <p>Face mill cutter(with replaceable inserts 20nos.) - Dia 80 mm</p> <p>Bull nose cutter(with replaceable inserts 20 nos)- Dia 50 mm</p> <p>End Mill cutter (with replaceable inserts 20 nos)- Dia 32 mm</p> <p>Bull nose cutter (with replaceable inserts 20 nos)- Dia 25 mm</p> <p>Endmill cutter (with replaceable inserts 20 nos)- Dia 20 mm</p> <p>Endmill cutter (with replaceable inserts 20 nos)- Dia 16 mm</p> <p>Carbide End Mill cutter (each two)- Dia. 3,4,5,6,8, 10,12,16 mm</p> <p>Carbide Ball End Mill cutter (each two)- Dia. 3,4, 5, 6, 8, 10, 12, 16 mm</p> <p>M8, M10,M12 HSS Tap with suitable Carbide Drills - 2 Sets</p> <p>HSS Drills ( one set) - Dia. 1 to 20 mm</p> <p>Centre Drill (Carbide &amp; HSS)-each 3 Different Sizes.</p> <p>Finish boring kit dia 10 to 40- 1 set</p>
10.11	Clamping Kit	Clamp set
		Precision Hydraulic Vise with jaw opening of 275 mm and clamping force 60 KN - 1 No 3 Jaw chuck - 300 mm dia - 1 no..
10.12	Others	Ethernet, USB ports
10.13	Software & Workstation	CAM software with post processor suitable for the machine to be quoted separately with Workstation
11	<b>Any other accessories (if available for better utilization)</b>	Bidder to specify and quote if any other accessories available /required for smooth running and better utilization of the machine.
12	<b>Terms &amp; Conditions</b>	<p>Manufacture/Supplier should have sizable installation of or better model worldwide and at least five in India which is educationally centrally funded institution. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details</p> <p>Equipment should be CE certified</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p>
13	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.

The CNC EDM with C-Axis capable of wear free ED machining with graphite electrode and copper electrode as per the following detailed specification.

	Make		Bidder to specify
	Model		Bidder to specify
1	Work Tank Size	mm	(800-1000) X (500- 700) X (250-450)
2	Axis Travel ( X x Y x Z)	mm	(400-500) x (300- 400) x (300-400)
3	Measurement resolution	µm	5 or better
4	Maximum Job weight	kg	>800
5	Max. electrode weight on automatic chuck	kg	>50 without C axis > 25 with C axis
6	Dielectric Unit		Filtration system - 10µ or better ; Flushing injections
7	Generator		ISPG Integrated or better
8	Max. machining current (Option)	A	60
9	Minimum surface roughness (Ra)	µm	1 or better
10	Control System	Latest with complete module CNC controller (or OEM system) and Capable storage to store large part programs for continuous running	
<b>11</b>	<b>Essential Accessories</b>		
11.1	Automatic Tool Changer Linear or	Bidder should quote and supply OEM/well known branded with make, model and major specification	
11.2	Rigid Linear Motor (X, Y, Z)		
11.3	Glass Scale Feedback (X, Y, Z		
11.4	Rotary Head		
11.5	C Axis		
11.6	Super finish Module		
11.7	Zero Wear Module		
11.8	Flushing system		
11.9	Filter set		
11.1	Servo voltage stabilizer		
11.11	Ultra Isolation transformer		
11.12	Silent operation Air Compressor with		
11.13	Chiller Unit		
11.14	Collet holder with collet set		
11.15	3D probe measuring system		
11.16	electrode holding system kit		
11.17	Remote controller		
11.18	Clamping kit		
11.19	Precision machine vice 4"		
11.20	Ethernet, USB ports, RS- 232C Communication Ports		
11.21	Fire Extinguisher		
11.22	Air gun with pipe		
11.23	Machine lamp		
11.24	Dielectric fluid (400 Litre)		
<b>12</b>	<b>Others</b>	Need to specify and quote if any other accessories required for smooth running of the machine	
<b>13</b>	<b>Terms &amp; Conditions</b>	The bidder must have supplied machines at other institutes in the past ( a satisfactory performance certificate from those user may be solicited if needed). Bidder should submit complete contact details.	
		Authorization Letter from OEM	
		List of clients in last five years to be provided.	
		Manufacture/Supplier should have sizable installation of or better model worldwide and at least five in India.	

<b>14</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.
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	Make	Bidder to specify	
	Model	Bidder to specify	
1	Type	Submerged	
2	Dimension of Table	mm	(800-1000) x (500-700)
3	Axis Travel (X x Y), U & V Travel	mm	(500- 600) x (400-500 ),maximum work piece height - 300mm.
4	Tapper angle and height	°/mm	30 / 100 or better
5	Wire Charateristics		Dia. 0.25 mm ; Type of wire guide - Closed diamond type without clearance Protection against electrolytic effects-
6	Max. cutting speed	mm2/ min	150 or Better
7	Max. weight of the workpiece	Kg	>400
8	Max. Machining current	A	25 or better
9	Min. finishing (Ra)	µm	1 or better
10	Position measurement system/ Measurement resoulation		5 or better
11	Architecture	Std Input & output accessories- LCD 15" TFT TouchScreen , Key board , Remote control ; PC multiprocessors; Ethernet, USB ports, RS-232C Communication Ports.	
12	Control System with software	Latest with complete module CNC controller (or OEM system) and Capable storage to store large part programs for continous running. Suitable software for programming and controlling.	
<b>13</b>	<b>Essential Accessories</b>		
13.1	Chiller Unit	Bidder should quote and supply OEM/well known branded with make, model and major specification	
13.2	Wire chopper		
13.3	Servo stabilizer		
13.4	Ultra Isolation transformer		
13.5	Silent operation Air Compressor with drier		
13.6	Air gun with pipe		
13.7	Holding & Clamping Kit (Such as vice, angle plate, v block, C-clamp etc.)		
13.8	Consumables	Minimum 10 Spools of coated wire and other necessary consumables.	
13.9	Filters	2 sets of 10 micron filters or better	
13.1	Workstation	Suitable latest workstation for part programming	
<b>14</b>	<b>Others</b>	Bidder to specify and quote if any other accessories available /required for smooth running of the equipment.	
<b>15</b>	<b>Terms &amp; Conditions</b>	<p>The bidder must have supplied machines at other institutes in the past ( a satisfactory performance certificate from those user may be solicited if needed). Bidder should submit complete contact details.</p> <p>Manufacturer of the supplied equipment must be ISO certified.</p> <p>Authorization Letter from OEM</p> <p>List of clients in last five years to be provided.</p> <p>Manufacture/Supplier should have sizable installation of or better model worldwide and at least five in India.</p>	

<b>16</b>	<b>Scope of supply</b>	Bidder should submit complete scope of supply (Machine, standard accessories, Optional Accessories etc with make model) in the technical bid without price. Bidder should supply complete start up package necessary to prove the machine and provide training.
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