



Government Engineering College, Ajmer,

N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer

INVITATION LETTER

Package Code: TEQIP-III/2019/RJ/GECA/80

Current Date: 07-Jun-2019

Package Name: GECA/TEQIP-III /2017-18/Electrical -
Electrical Machine-II

Method: Shopping Goods

To,

M/S _____

Sub: Invitation Letter For GECA/TEQIP-III /2017-18/Electrical - Electrical Machine-II

Dear Sir,

1. You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

Sr. No	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
1	Auto range Digital Multimeter	4	Govt. Engg. College, Ajmer N.H. 8, Barliya Circle, Near Nareli Temple, Ajmer	On site installation and testing & commissioning required. Price must be included in quotation
2	Electrical Machines Trainer set	1		
3	3 MHz Multi-Waveform Signal Generator	2		
4	70 MHz Digital Storage Oscilloscope	4		
5	4½ Digit True Rms Digital Multimeter	2		

2. Government of India has received a credit from the International Development Association (IDA) towards the cost of the **Technical Education Quality Improvement Programme [TEQIP]-Phase III**

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Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.

3. Quotation

- 3.1 The contract shall be for the full quantity as described above.
- 3.2 Corrections, if any, shall be made by crossing out, initialling, dating and re writing.
- 3.3 All duties and other levies payable by the supplier under the contract shall be included in the unit Price.
- 3.4 Applicable taxes shall be quoted separately for all items.
- 3.5 The prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- 3.6 The Prices should be quoted in Indian Rupees only.

4. Each bidder shall submit only one quotation.

5. Quotation shall remain valid for a period not less than **90** days after the last date of quotation submission.

6. Evaluation of Quotations: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which

- 6.1 are properly signed; and
- 6.2 Confirm to the terms and conditions, and specifications.

7. The Quotations would be evaluated for all items together.

8. Award of contract The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

- 8.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of Contract.
- 8.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation

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validity period. The terms of the accepted offer shall be Incorporated in the purchase order.

9. Payment shall be made in Indian Rupees as follows:

Satisfactory Delivery & Installation - 90% of total cost
Satisfactory Acceptance - 10% of total cost

10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min % :N/A
Liquidated Damages Max % : N/A

11. All supplied items are under warranty of **36** months from the date of successful acceptance of items and AMC/Others is **No**.

12. You are requested to provide your offer latest by 12:30 PM on 22-Jun-2019.

13. The quotation received with in stipulated date and time shall be open on 22-June-2019.

14. You are requested to attend the bid opening meeting on 22-June-2019

15. Detailed specifications of the items are at Annexure I.

16. Training Clause (if any) **No**

17. Testing/Installation Clause (if any) **Yes**

18. Performance Security shall be applicable: **0%**

19. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.

20. Proof of good working profile of last five years in terms of copy of purchase order of similar items and value.

21. Proof of Original Equipment Manufacturer or Authorized Dealer or Channel Partner.

22. Affidavit of non –black listed/debarred by any government organization in last five year.

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Sealed quotation to be submitted/ delivered at the address mentioned below,
Government Engineering College, Ajmer,N.H.8 , Barliya Circle, Near Nareli
Temple, Ajmer

- 23.** We look forward to receiving your quotation and thank you for your interest in this project.

(Authorized Signatory)

Dr. Rohit Misra, Principal
Name & Designation

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Annexure I

S. N.	Item Name	Specifications																																																											
1	3 3/4 Auto range Digital Multimeter	<p>Features</p> <ul style="list-style-type: none"> ➤ New Type Holster, Streamline Design ➤ Large LCD Makes the Reading Clear ➤ Strong Antimagnetic and Anti-jamming Performance ➤ Full Function Protection ➤ Unit Symbol Display, Very Easy to Read ➤ Relative Value, Frequency / Duty Cycle Measuring, Data Hold <p>Technical Specifications</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Basic Function</th> <th style="width: 40%;">Range</th> <th style="width: 30%;">Accuracy</th> </tr> </thead> <tbody> <tr> <td>DCV</td> <td>400mV / 4V / 40V / 400V / 1000V</td> <td>±(0.5% +4)</td> </tr> <tr> <td>ACV</td> <td>400mV / 4V / 40V / 400V / 750V</td> <td>±(0.8% +6)</td> </tr> <tr> <td>DCA</td> <td>400uA / 4mA / 40mA / 400mA / 4A/20A</td> <td>±(1.0% +5)</td> </tr> <tr> <td>ACA</td> <td>400uA / 4mA / 40mA / 400mA / 4A/20A</td> <td>±(1.5% +5)</td> </tr> <tr> <td>Resistance</td> <td>400Ω / 4kΩ / 40kΩ / 400kΩ / 4MΩ / 40MΩ</td> <td>±(0.8% +1)</td> </tr> <tr> <td>Capacitance</td> <td>4nF / 40nF / 400nF / 4uF / 40uF / 200uF</td> <td>±(2.5% +6)</td> </tr> <tr> <td>Frequency</td> <td>10Hz / 100Hz / 1kHz / 10kHz / 100kHz / 1MHz / 30MHz</td> <td>±(0.5% +4)</td> </tr> <tr> <td>Temperature</td> <td>-40°C – 1000°C</td> <td>±(0.8% +4)</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Special Function</th> <th style="width: 40%;"></th> </tr> </thead> <tbody> <tr> <td>Diode Test</td> <td style="text-align: center;">•</td> </tr> <tr> <td>hFE Test</td> <td style="text-align: center;">•</td> </tr> <tr> <td>Continuity Test</td> <td>Approx. less than 30Ω ±10 Ω</td> </tr> <tr> <td>Low Battery Indication</td> <td>Approx less than 2.4V.</td> </tr> <tr> <td>Duty Cycle Measuring</td> <td></td> </tr> <tr> <td>Data Hold Auto Power Off</td> <td>Approx. 15 minutes.</td> </tr> <tr> <td>Function Protection</td> <td></td> </tr> <tr> <td>Input Impedence</td> <td>10MΩ</td> </tr> <tr> <td>Sampling Rate</td> <td>3 times/s.</td> </tr> <tr> <td>AC Frequency Response</td> <td>40 – 400Hz.</td> </tr> <tr> <td>Operation Method</td> <td>Manual or Auto Range.</td> </tr> <tr> <td>Max. Display</td> <td>4000.</td> </tr> <tr> <td>LCD Size</td> <td>65 x 41mm.</td> </tr> <tr> <td>Battery</td> <td>3V, AAA x 2.</td> </tr> <tr> <td>Power Dissipation</td> <td>Quiescent current approx. 2mA.</td> </tr> </tbody> </table> <p style="text-align: center;">OR</p>	Basic Function	Range	Accuracy	DCV	400mV / 4V / 40V / 400V / 1000V	±(0.5% +4)	ACV	400mV / 4V / 40V / 400V / 750V	±(0.8% +6)	DCA	400uA / 4mA / 40mA / 400mA / 4A/20A	±(1.0% +5)	ACA	400uA / 4mA / 40mA / 400mA / 4A/20A	±(1.5% +5)	Resistance	400Ω / 4kΩ / 40kΩ / 400kΩ / 4MΩ / 40MΩ	±(0.8% +1)	Capacitance	4nF / 40nF / 400nF / 4uF / 40uF / 200uF	±(2.5% +6)	Frequency	10Hz / 100Hz / 1kHz / 10kHz / 100kHz / 1MHz / 30MHz	±(0.5% +4)	Temperature	-40°C – 1000°C	±(0.8% +4)	Special Function		Diode Test	•	hFE Test	•	Continuity Test	Approx. less than 30Ω ±10 Ω	Low Battery Indication	Approx less than 2.4V.	Duty Cycle Measuring		Data Hold Auto Power Off	Approx. 15 minutes.	Function Protection		Input Impedence	10MΩ	Sampling Rate	3 times/s.	AC Frequency Response	40 – 400Hz.	Operation Method	Manual or Auto Range.	Max. Display	4000.	LCD Size	65 x 41mm.	Battery	3V, AAA x 2.	Power Dissipation	Quiescent current approx. 2mA.
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2	Electrical Machines Trainer set	<p>B) Each control panel rack consists of : -</p> <p>Input 3 phase DOL Starter panel [10 Shrouded Banana] 1 No.</p> <ul style="list-style-type: none"> • 4 pole MCB of 415 V/1A . • DOL 9A Contactor with 230V / 50 Hz / 11VA COIL . • Bimetallic thermal O/L relay with range 1.4A - 2.3A . <p>Multifunction 3 Phase Meter 2 Nos.</p>																																																											

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	<ul style="list-style-type: none">• Connection : 3Phase 3/4 wire• Volts Input : 400V/230V AC• Aux Supply : 230V AC, 45-65Hz,5W• Display : LCD Display• CT Input : 5A, 0.1 VA/Ph.• Measurement: V, I, Hz, Pf, KVA, KW, KWh• Computer Input : Modbus RTU RS 485• Termination : SBSS Terminal <p>FWD/REV ,Star-Delta starter panel [12 Shrouded Banana] 1 No.</p> <ul style="list-style-type: none">• FWD/REV, 3 pole 3 way switch with centre OFF,6A/440V.• Star/Delta switch 3 pole ,3 way with centre OFF,6A/440V. <p>3 Phase wound Rotor & Sync. Motor panel [8 Shrouded Banana] 1 No.</p> <ul style="list-style-type: none">• Rotor resistors of 30E/5A with 3 taps of 0E, 15E, 21E, 30E<ul style="list-style-type: none">• Rotor resistor selector switch ,3 pole.6 Way .6A/440 V.• DC Rotor excitation over current relay (3Amp) <p>1 Phase Motor, Alternator & Sync. Motor Panel [14 Shrouded Banana] - 1 No.</p> <ul style="list-style-type: none">• 1ϕ MCBs of 4A/1.6A – 2nos.• 2no 2P2W selector switches to run as 1ϕ alternator then as synchronous motor.• 8A pushbutton switch to simulate as centrifugal switch. <p>DC voltmeter and DC ammeter panel [14 Shrouded Banana] 1 No.</p> <p>a) DC voltmeter(0-300V) b) DC Ammeter (0-5A) with polarity protection diode</p> <p>c) Field failure relay to control Armature supply. Both 6A/6B needed simultaneously.</p> <p>SCR Actuator (variable DC) cum sensor signal conditioning panel [4 Shrouded Banana]-3 Nos.</p> <ul style="list-style-type: none">• Half bridge SCR based 0V-195V / 5 Amp cosine firing with linear characteristics.• Supports signal conditioning circuit for speed, torque in kg wt to output 0-2.5Vdc (FS).• 3 Nos. of these supplies required for DC Armature, DC motor field and AC generator field. <p>Instrumentation Power supply cum Multichannel DPM panel [10 Shrouded Banana] 1 No.</p> <p>(a) +/-12 V ,500 mA (b) +5V ,300mA (c) Unregulated 17V dc/750 mA (d) line synchronizing signal.</p> <p>(e) 13V / 3 Amp. (f) Multi channel DPM for digital display of torque, speed etc</p> <p>Resistor Load Panel 1 No.</p> <p>Should have off position to run on no load.</p> <p>(1)AC Resistors = 10K/200WX3 phases/ 6 steps (2) DC Resistors = 750E/400W / 6 steps</p> <p>LC Load panel 2 Nos</p> <p>(A) Inductive load =</p>
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		<p>0.15H/0.3H/0.45H/0.6H/0.75H/1.5H/3H/400mAX3Nos. (B) Capacitive load =1.25μ/2.5μ/5μ/415VX 3Nos. a. DC INTEGRATED M/C 1 No. Voltage : Varm = 180V, Vfield = 180V Capacity/RP M/Terminals : 300W / 2 Pole m/c / 1500RPM 6 terminals Rotor Construction : Should be Standard commutator / brush arrangement with laminated stack, brought out on 2 terminals Stator Construction : separately excited field winding with laminated pole solid yoke and series winding brought out on 4 terminals Chasis mounted, 19mm dia, trunion mounted Machine for use as Dynamometer with torque & speed sensors. Must be able to work as shunt/series/compound motor as well as generator.</p> <p>Following Essential accessories should be provided with trainer: A) Hand held tacho meter – 1 No. B) Shrouded patch chord – 118 C) Well written students workbook explaining atleast 50 experiments with instructor guide–1 No. D) DEMO CD to help student to work by themselves – 1 No.</p>																																
3	3 MHz Multi-Waveform Signal Generator	<p>Features</p> <ul style="list-style-type: none"> ➤ Wide Frequency Range ➤ Sine, Triangle, Square, Ramp, Pulse, TTL (Sync) & DC Outputs ➤ Low Distortion High Resolution on Low Frequency ➤ Output Attenuation upto 80dB ➤ Variable DC Offset Control ➤ Four Digit digital Display with Frequency Indication in Hz, KHz, MHz / Amplitude display <p>Technical Specifications</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">ACQUISITION</td> </tr> <tr> <td colspan="2" style="text-align: center;">MULTI-WAVEFORM SIGNAL GENERATOR</td> </tr> <tr> <td>Frequency Range</td> <td>0.01Hz to 3MHz in 8 decade ranges.</td> </tr> <tr> <td>Frequency Indication</td> <td>$\pm 1\%$ ± 1 digit.</td> </tr> <tr> <td>Output Impedance</td> <td>50 ohms</td> </tr> <tr> <td>Frequency Indication Accuracy</td> <td>$\pm 1\%$ +1 digit</td> </tr> <tr> <td>Output Waveforms</td> <td>Sinusoidal, Triangle, Square, Ramp, Pulse, TTL (Sync) & DC Outputs.</td> </tr> <tr> <td>Sine Distortion</td> <td>< 1% (Typical)</td> </tr> <tr> <td>Square Wave Rise / Fall Time</td> <td><75nsec.</td> </tr> <tr> <td>Frequency Stability</td> <td><0.5% of the set frequency (after ½ Hour warm up.)</td> </tr> <tr> <td>Duty Cycle</td> <td>10% to 90% variable.</td> </tr> <tr> <td>Maximum Output Voltage</td> <td></td> </tr> <tr> <td style="padding-left: 20px;">a) Into 50 ohms</td> <td>10V p-p output.</td> </tr> <tr> <td style="padding-left: 20px;">b) Open Circuit</td> <td>20V p-p output</td> </tr> <tr> <td>Amplitude Indication</td> <td>3 digit seven segment display (Vp-p) $\pm 5\%$</td> </tr> <tr> <td>Amplitude Flatness</td> <td>± 0.5dB upto 100KHz range / ± 1.0dB for 1MHz range.</td> </tr> </table>	ACQUISITION		MULTI-WAVEFORM SIGNAL GENERATOR		Frequency Range	0.01Hz to 3MHz in 8 decade ranges.	Frequency Indication	$\pm 1\%$ ± 1 digit.	Output Impedance	50 ohms	Frequency Indication Accuracy	$\pm 1\%$ +1 digit	Output Waveforms	Sinusoidal, Triangle, Square, Ramp, Pulse, TTL (Sync) & DC Outputs.	Sine Distortion	< 1% (Typical)	Square Wave Rise / Fall Time	<75nsec.	Frequency Stability	<0.5% of the set frequency (after ½ Hour warm up.)	Duty Cycle	10% to 90% variable.	Maximum Output Voltage		a) Into 50 ohms	10V p-p output.	b) Open Circuit	20V p-p output	Amplitude Indication	3 digit seven segment display (Vp-p) $\pm 5\%$	Amplitude Flatness	± 0.5 dB upto 100KHz range / ± 1.0 dB for 1MHz range.
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		Attenuator	Two step attenuators of 20dB & 40dB. Fine attenuation of 20dB through vernier control. (Total 80 dB attenuation).																						
		Attenuator Accuracy	±0.5dB per 20dB at 1KHz.																						
		DC Offset	±10V ±5% (DC + AC peak) in open circuit ±5V ±5% (DC + AC peak) in 50 ohms.																						
		POWER REQUIREMENT																							
		AC Mains Power	230V AC ±10%, 50Hz., 15VA. (Approx.)																						
		GENERAL																							
		Dimensions (mm)	270 (W) x 88 (H) x 310 (D) w/o packing / 325 (W) x 153 (H) x 380 (D) with packing.																						
		Weight (approx.)	3 Kg. w/o packing / 4 Kg. with packing.																						
		Standard Accessories	Instruction Manual 1 No. BNC(M) to Alligator Clip 1 No. Mains Cord 1 No																						
		Optional Accessory	50 ohms Termination.																						
4	70 MHz Digital Storage Oscilloscope	<p>Features</p> <ul style="list-style-type: none"> ➤ 70MHz Bandwidths ➤ 1GSa/s Real Time Sample Rate ➤ Trigger Mode : Edge, Pulse Width, Video, Slop, Overtime, Alternative Trigger etc. ➤ Provides Software for PC Real-time Analysis ➤ Five Math Functions, +, -, *, /, and FFT functions ➤ 32 Automatic Measurements and Track Measurement via Cursor Automatically ➤ Large (7") Color Display, WVGA (800 x 480) ➤ Support U Disk and Local Files Storage ➤ Pass / Fail Function Enables to Output Testing Results <p>Applications</p> <ul style="list-style-type: none"> ➤ Design and Debug ➤ Education and Training ➤ Manufacturing Test and Quality Control ➤ Service and Repair ➤ Electronic Circuit Designing and Testing <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">ACQUISITION</td> </tr> <tr> <td>Sample Rate Real</td> <td>Time Sample: 1GS/s; Equivalent Sample: 25GS/s</td> </tr> <tr> <td colspan="2">Acquisition Modes</td> </tr> <tr> <td>Normal</td> <td>Normal data only</td> </tr> <tr> <td>Peak Detect</td> <td>High-frequency and random glitch capture</td> </tr> <tr> <td>Average</td> <td>Waveform Average, selectable 4, 8, 16, 64, 128.</td> </tr> <tr> <td colspan="2">Inputs</td> </tr> <tr> <td>Input Coupling</td> <td>AC, DC, GND</td> </tr> <tr> <td>Input Impedance</td> <td>1MΩ ±2%, 20pF ±3pF.</td> </tr> <tr> <td>Probe Attenuation</td> <td>1X, 10X.</td> </tr> <tr> <td>Supported Probe Attenuation Factor</td> <td>1X, 10X, 100X, 1000X.</td> </tr> </table>		ACQUISITION		Sample Rate Real	Time Sample: 1GS/s; Equivalent Sample: 25GS/s	Acquisition Modes		Normal	Normal data only	Peak Detect	High-frequency and random glitch capture	Average	Waveform Average, selectable 4, 8, 16, 64, 128.	Inputs		Input Coupling	AC, DC, GND	Input Impedance	1MΩ ±2%, 20pF ±3pF.	Probe Attenuation	1X, 10X.	Supported Probe Attenuation Factor	1X, 10X, 100X, 1000X.
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	Max. Input Voltage	CAT I and CAT II : 300V RMS (10X); Installation Category III : 150V RMS (1X); Installation Category II : derate at 20dB/decade above 100kHz to 13V peak AC at 3MHz and above. For non- sinusoidal waveforms, peak value must be less than 450V. Excursion above 300V should be of less than 100ms duration. RMS signal level including all DC components removed through AC coupling must be limited to 300V. If these values are exceeded, damage to the oscilloscope may occur.	
	HORIZONTAL		
	Waveform Interpolation	(sin x) / x.	
	Record Length	24K.	
	SEC/DIV Range	2ns/div to 40s/div, in a 2, 4, 8 sequence, D37200A. 4ns/div to 40s/div, in a 2, 4, 8 sequence, D37100A / D37070A	
	Sample Rate and Delay Time Accuracy	±50ppm(at over any =1ms time interval).	
	Position Range	D37200A : 2ns/div to 10ns/div; (-4div x s/div) to 20ms; D37100A / D37070A : 20ns/div to 80us/div; (-8div x s/div) to 40ms; 200µs/div to 40s/div; (-8div x s/div) to 400s;	
	Delta Time Measurement Accuracy (Full Bandwidth)	Single-shot, Normal mode : ± (1 sample interval +100ppm x reading + 0.6ns); >16 averages : ± (1 sample interval + 100ppm x reading + 0.4ns); Sample Interval = s/div ÷ 200.	
	VERTICAL		
	Vertical Resolution	8-bit resolution, all channel sampled simultaneously.	
	Volts/Div Range	2mV/div ~ 5V/div.	
	Position Range	2mV/div to 200mV/div; ±2V; 200mV/div to 5V/div; ±50V	
	Bandwidth	D37200A: 200MHz; D37100A: 100MHz; D37070A: 70MHz;	
	Rise Time at BNC (Typical)	D37200A: 1.8ns; D37100A: 3.5ns; D37070A: 5ns	
	Analog Bandwidth in Normal and	2mV/div to 20mV/div, ±400mV; 50mV/div to 200mV/div, ±2V;	

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Average Modes at BNC or with probe, DC Coupled	500mV/div to 2V/div, $\pm 40V$; 5V/div, $\pm 50V$.	
Math	+, -, *, \div , FFT	
FFT	Windows : Hanning, Flatop, Rectangular, Bartlett, Blackman; 1024 sample point.	
Bandwidth Limit	20MHz.	
Low Frequency Response (-3dB)	<10Hz at BNC	
DC Gain Accuracy	$\pm 3\%$ for Normal or Average acquisition mode, 5V/div to 10mV/div; $\pm 4\%$ for Normal or Average acquisition mode, 5mV/div to 2mV/div	
DC Measurement Accuracy, Average Acquisition Mode	When vertical displacement is zero, and $N > 16$: $\pm (3\% \times \text{reading} + 0.1 \text{ div} + 1\text{mV})$ only 10mV/div or greater is selected; When vertical displacement is not zero, and $N > 16$: $\pm [3\% \times (\text{reading} + \text{vertical position}) + 1\% \text{ of vertical position} + 0.2\text{div}]$; Add 2mV for settings from 2mV/div to 200mV/div; add 50mV for settings from 200mV/div to 5V/div	
Volts Measurement Repeatability, Average Acquisition Mode	Delta volts between any two averages of ≥ 16 waveforms acquired under same setup and ambient conditions.	
TRIGGER		
Trigger Types	Edge, Video, Pulse, Slope, Over time, Alternative	
Trigger Source	CH1, CH2, EXT, EXT/5, AC Line	
Trigger Modes	Auto, Normal	
Coupling Type	DC, AC, Noise Reject, HF Reject, LF Reject	
Trigger Sensitivity (Edge Trigger Type)	DC (CH1, CH2) : 1div from DC to 10MHz; 1.5div from 10MHz to 100MHz; 2div from 100MHz to 200MHz; DC (EXT) : 200mV from DC to 100MHz; 350mV from 100MHz to 200MHz; DC (EXT/5) : 1V from DC to 100MHz; 1.75V from 100MHz to 200MHz; AC : Attenuates signals below 10Hz. HF Reject : Attenuates signals above 80kHz. LF Reject :	

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		Same as the DC-coupled limits for frequencies above 150KHz; Attenuates signals below 150KHz	
Trigger Level Range		CH1/CH2 : ± 8 divisions from center of screen; EXT : $\pm 1.2V$; EXT/5 : $\pm 6V$	
Trigger Level Accuracy (typical) Accuracy is for signals having rise and fall times $\geq 20ns$		CH1/CH2 : 0.2 div x volts/div within ± 4 divisions from center of screen; EXT : $\pm (6\% \text{ of setting} + 40mV)$; EXT/5 : $\pm (6\% \text{ of setting} + 200mV)$.	
Set Level to 50% (typical)		Operates with input signals $> 50Hz$.	
Trigger Holdoff range		100ns - 10s.	
Video Trigger			
Video Trigger Type		CH1, CH2 : Peak-to-peak amplitude of 2 divisions; EXT : 400mV; EXT/5 : 2V.	
Holdoff Range			
Pulse Width Trigger			
Pulse Width Trigger Mode		Trigger when (, =, or =); Positive pulse or Negative pulse.	
Pulse Width Trigger Point		Equal : The oscilloscope triggers when the trailing edge of the pulse crosses the trigger level. Not Equal : If the pulse is narrower than the specified width, the trigger point is the trailing edge. Otherwise, the oscilloscope triggers when a pulse continues longer than the time specified as the Pulse Width. Less than : The trigger point is the trailing edge. Greater than (also called overtime trigger) : The oscilloscope triggers when a pulse continues longer than the time specified as the Pulse Width.	
Pulse Width Range		20ns ~ 10s.	
Overtime Trigger			
Over Time Mode		Rising edge or Falling edge.	
Time Range		20ns ~ 10s.	
Slope Trigger			
Slope Trigger Mode		Trigger when (, =, or =); Positive slope or	

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		Negative slope	
	Slope Trigger Point	<p>Equal : The oscilloscope triggers when the waveform slope is equal to the set slope.</p> <p>Not Equal : The oscilloscope triggers when the waveform slope is not equal to the set slope.</p> <p>Less than : The oscilloscope triggers when the waveform slope is less than the set slope.</p> <p>Greater than : The oscilloscope triggers when the waveform slope is greater than the set slope.</p>	
	Time Range		
	Alternative Trigger		
	Trigger on CH1	Internal Trigger : Edge, Pulse Width, Video, Slope.	
	Trigger on CH2	Internal Trigger : Edge, Pulse Width, Video, Slope.	
	Trigger Frequency Counter		
	Readout Resolution	6 digits.	
	Accuracy (Typical)	± 30 ppm (including all frequency reference errors and ± 1 count errors).	
	Frequency Range	AC coupled, from 4Hz minimum to rated bandwidth.	
	Signal Source	<p>Pulse Width or Edge Trigger modes: all available trigger sources.</p> <p>The Frequency Counter measures trigger source at all times, including when the oscilloscope acquisition pauses due to changes in the run status, or acquisition of a single shot event has completed.</p> <p>Pulse Width Trigger mode : The oscilloscope counts pulses of significant magnitude inside the 1s measurement window that qualify as triggerable events, such as narrow pulses in a PWM pulse train if set to < mode and the width is set to a relatively small time.</p> <p>Edge Trigger Mode : The oscilloscope counts all edges of sufficient magnitude and correct polarity.</p> <p>Video Trigger Mode : The Frequency Counter</p>	

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			does not work.
		MEASUREMENT	
		Cursor Measurement	Manual : Voltage difference between cursors : ΔV; Time difference between cursors : ΔT; Reciprocal of ΔT in Hertz (1/ΔT); Tracing : The voltage and time at a waveform point.
		Auto Measurement	Frequency, Period, Mean, Pk-Pk, Cycle RMS, Minimum, Maximum, Rise time, Fall Time, +Pulse Width, -Pulse Width. Delay 1-2 Rise, Delay 1-2 Fall, +Duty, -Duty, Vbase, Vtop, Vmid, Vamp, Overshoot, Preshoot, Period Mean, Period RMS, FOVShoot, RPREShoot, BWIDTH, FRF, FFR, LRR, LRF, LFR, LFF
		DISPLAY	
		Display Type	7" 64K color TFT (diagonal liquid crystal).
		Display Resolution	800 horizontal by 480 vertical pixels.
		Display Contrast	Adjustable (16 gears) with the progress bar
		PROBE COMPENSATOR OUTPUT	
		Output Voltage (Typical)	About 5Vpp into > 1MW load.
		Frequency (Typical)	1KHz.
		POWER SUPPLY	
		Supply Voltage	100 - 120V AC RMS (±10%), 45Hz to 440Hz, CAT II. 120 - 240V AC RMS (±10%), 45Hz to 66Hz, CAT II.
		Power Consumption	<30W
		Fuse	2A, T rating, 250V.
		Dimension (mm)	313 (L) x 108 (W) x 142 (H).
		Net Weight	2.08 Kg.
5	4½ DIGIT TRUE RMS DIGITAL MULTIME TER	Features <ul style="list-style-type: none"> • 19999 Counts 4 ½ Digit 40 mm High Characters Jumbo LCD Display. • Dual Slope integration A/D Converter System • Basic DC Voltage Accuracy of ±0.05%. • True RMS AC Measurement • Capacitance Measurement • All ranges are fully overload protected • Frequency Measurement upto 200 KHz\ • Diode Testing • Continuity Testing (Buzzer) • Automatic Polarity Indication • hfe Testing Technical Specifications Accuracies are ± (% Reading + no. of Digits) , 23°C ±5°C, <80%	

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RH, DC Voltage

Range	Accuracy	Resolution
200mV	$\pm(0.05\%+3d)$	10 μ V
2V		100 μ V
20V		1 mV
200V		10mV
1000V	$\pm(0.1\%+5d)$	100mV

Input Impedance : 10 M Ω , all ranges.

Overload Protection : 250V DC/AC Peak on 200mV range.

1000V DC or AC Peak on other ranges.

AC Voltage (True RMS)

Range	Input Frequency	Accuracy (input>10% of full scale)	Resolution
200mV	50Hz-50kHz	$\pm(0.8\%+80d)$	10 μ V
2V	50Hz-20KHz		100 μ V
20V			1 mV
200V	50Hz-5kHz		10mV
750V	50Hz-400Hz	$\pm(1.0\% +20d)$	100mV

Input Value more than 10% of full scale range.

Input impedance : 2M Ω on all ranges.

Overload Protection : 1000V DC/AC PEAK, except AC 200mV range (250 V DC/AC Peak)

DC CURRENT

Range	Accuracy	Resolution
20mA	$\pm(0.3\% +10d)$	1 μ A
200mA		10 μ A
2A		100 μ A
20A	$\pm(0.8\%+10d)$	1mA

Overload Protection: 0.2A/250V, 20A/250V fast-fuse.

Max. input Current : 20A (up to 15 seconds)

Max. Measuring Voltage: 200mV.

AC Current (True RMS)

Range	Input Frequency	Accuracy (Input > 10% of full scale)	Resolution
200mA	50Hz -5kHz	$\pm(0.08\%+80d)$	10 μ A
2A			100 μ A
20A	50Hz-400Hz	$\pm(1.0\% +20d)$	1mA

Overload Protection : 0.2A/250V, 20A/250V Fast-fuse.

Max. Input Current : 20A (upto 15 seconds)

Max. Measuring Voltage: 200mV

RESISTANCE

Range	Accuracy	Resolution
200 Ω	$\pm(0.1\% +2d)$	0.01 Ω
2K Ω		0.1 Ω
20K Ω		1 Ω

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200K Ω		10 Ω
2M Ω		100 Ω
20M Ω	$\pm(0.2\%+5d)$	1K Ω



Overload Protection : 250V DC/AC Peak on all ranges.

Open Circuit Voltage : Less than 3V.

Capacitance

Range	Accuracy	Resolution
20nF	$\pm(1.0\% +20d)$	0.001nF
2 μ F		0.1nF
200 μ F		0.0 μ F

Diode Test and Continuity Test

Range	Description	Test Condition
	Display read approx, forward voltage of diode.	Forward DC Current approx.1mA. Reversed DC voltage approx. 3V.
	Buzzer sounds if resistance between terminals V/ Ω and COM is less than about 70 Ω .	Open Circuit Voltage 3V.

Overload Protection : 250VDC/AC PEAK.

Frequency

Range	Accuracy	Resolution
20kHz	$\pm(1.5\%+20d)$	1 Hz
200KHz		10Hz

Input Sensitivity : 100mV RMS.

Overload Protection: 250V DC/AC Peak (max. 15 Seconds).

General

Power Supply : 220-240V/110-120V AC (Selectable) $\pm 10\%$, 50Hz or 60Hz.

Temperature for Guaranteed Accuracy : 23° $\pm 5^\circ$ C.

Temperature Range :

Operating 0°C to 40°C (32° F to 104°F), Humidity <75%RH.

Storage -10°C to 50°C (14° F to 122°F), Humidity <75% RH.

Size: 260(H) x 220(W) x 105 (D) mm.

Weight: Approx 1Kg.

Accessories : Operating Manual

Test Leads (Red and Black 1 Pair)

Power Cord etc.

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FORMAT FOR QUOTATION SUBMISSION

(In letterhead of the supplier with seal)

Date: _____

To: _____

Sl. No.	Description of goods \ (with full Specifications)	Qty.	Unit	Quoted Unit rate in Rs. (Including Ex-Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments)	Total Price (A)	Sales tax and other taxes payable	
						In %	In figures (B)
Total Cost							

Gross Total Cost (A+B): Rs. _____

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. _____ (Amount in figures) (Rupees _____ amount in words) within the period specified in the Invitation for Quotations.

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We confirm that the normal commercial warranty/ guarantee of _____ months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier

Name: _____

Address: _____

Contact No. _____