

BID DOCUMENT

Open Competitive Bid (OCB)

For

**Procurement of Equipment's
for Strength of Materials Labs**

For

**Campuses at Constituent Institutes of
Rajiv Gandhi University of Knowledge
Technologies**

Proprietary & Confidential

**RAJIV GANDHI UNIVERSITY OF KNOWLEDGE
TECHNOLOGIES**

Ground Floor, Vindhya C4 Building, IIIT-H,

Gachibowli, HYDERABAD- 500 032

Phone: 040-23001830

Proprietary & Confidential

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News paper advertisement

Short Tender Notice



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Sealed Tenders are hereby invited from reputed manufacturers and authorized dealers for Supply, Installation & Commissioning of Equipments for Strength of Materials Labs to three RGUKT IIITs located at Basara (Adilabad District), Nuzvid (Krishna District) and R.K. Valley (Kadapa District).

Last date for submission of tender document along with EMD as specified in the bid document is on 27-06-2011 before 4.00 pm.

Interested parties can collect the Tender document from the office of the RGUKT from 18-06-2011 to 25-06-2011 against payment of Rs. 5,000/- towards the cost of Tender document fee (non-refundable) through D.D. payable to REGISTRAR, RGUKT at Hyderabad. Further details visit our website www.rgukt.in

Date: 18 -06-2011

/sd/-
Registrar,
RGUKT

Time schedule of various Short tender related events

Bid calling date	18 -06-2011
Last date for sale of document	25-06-2011at 05:00 P.M
Bid closing date/time	27-06-2011at 04:00 P.M.
Technical Bid Opening date/time	27-06-2011at 04:30 P.M.
Price Bid opening date/time	29 -06-2011at 4:30 P.M.
Bid Document fee	Rs.5,000/-
Contact person	Registrar, RGUKT
Reference No	RGUKT/Short Tender/SMLE/P1/010/2011

Registrar,
RGUKT

TENDER FORM

Not transferable

Reference: No. RGUKT/Short Tender/SMLE/P1/010 /2011

Dated: 18-06-2011

Subject:- Tender for Supply & installation and commissioning of Strength of Materials Lab Equipment's for three RGU KT IIITs located at Basara (Adilabad Dist), Nuzvid (Krishna Dist) and RK Valley (Kadapa Dist).

Last date for submission of the TENDER AT HYDERABAD is **27-06-2011 up to 04:00 P.M.**

Dear Sir/Madam,

- A. RGUKT invites sealed tenders comprising technical bid and price bid separately from reputed manufacturers (or) authorized dealers for three RGUKT IIITs located at Basara (Adilabad Dist), Nuzvid (Krishna Dist) and R K Valley (Kadapa Dist).
- B. The Tender form consists of 35pages of which pages from 6 to 27 are instructions and page No.28 is financial bid. The duly completed Technical Bid together with a copy of the bid document (this tender) signed on all pages and the Price Bid should be kept in separate sealed covers and these sealed covers may be submitted in a sealed master envelope superscripted with "Tender for Supply , Install & Commissioning of Strength of Materials Lab Equipment's to the students of IIITs under the RGUKT. The last date for submission of TENDER is **27-06-2011 before 04:00 P.M.**
- C. The Sealed Tenders shall be deposited in the Tender box kept in the office of Registrar, RGUKT up to **04:00 P.M. on 27 -06-2011.**

For any clarification and further details on the above tender please contact Telephone No: 23001830 or Contact Person during office hours.

Thanking you

Yours faithfully,

Registrar,
RGUKT

STATEMENT OF IMPORTANT LIMITS/VALUES RELATED TO BID

Item	Description
EMD	Rs. 1,00,000/-
Bid Validity Period	60 days from the date of opening of commercial bid
EMD Validity Period	60 days from the date of opening of commercial bid
Warranty Period	3 years
Variation in quantities/number of residents	<u>± 40 %</u>
Period for furnishing performance Security	Within 10 days from date of receipt of award
Delivery Schedule	Bidder must be prepared to deliver and install the enclosed list of Equipment within 30 days from the date of award of the contract.
Performance security value	5% of contract value
Performance security validity period	38 months from award of contract (including 30 days of installation period)
Period for signing the order Acceptance	Within 7 days from date of receipt of notification of award

Payment terms	
On delivery at user site	<p>Payment for goods and services shall be made in Indian rupees as follows.</p> <ol style="list-style-type: none"> 1. 80% of payment will be paid after installation, commissioning 2. Balance 20% will be paid after 3 months after obtaining the satisfactory certificate from the Director, RGUKT IIITs.
Maximum Liquidated Damages for late deliveries	<p>For delays:- If the supplier fails to deliver any (or) all of the goods or perform the services within the time period specified in the contract the purchaser shall without prejudice to its other remedies under the contract deduct from the contract price as liquidated damages a sum equivalent to 0.25% of the contract value per day until actual delivery or performance up to a maximum deduction of 10% of the delayed goods or services contract price. Once the maximum deduction is reached, the purchaser may consider the termination of the contract duly forfeiting the performance security etc.,</p>

4 ELIGIBILITY CRITERIA

- 5.1 This bid is open to all firms within India and other firms which have agencies in India are eligible to do business under relevant Indian Laws as in force at the time of bidding, subject to meeting the pre-qualifications criterion and provide List of customers of previous supply of similar items to IITs, NIT's or Central Universities or any Academic Institute of National Repute with contact details, Submit the proof of copies.
- 5.2 The bidder should have Services facility or work shop with in India and ability to provide service at a short notice and short time.
- 5.3 The Bidder should have minimum turnover, the bidder quoting less than Rs. 50.00 Lakhs their turn over should be Rs. 1.00 Crore, Rs. 50 Lakhs above and less than One Crore their turn over should be 2.00 Crores and Rs. 1.00 crore and above their turn over should be Rs. 3.00 Crores in last financial year ending march 2011 duly submitting the proofs in support of their claims.
- 5.4 He should furnish satisfactory performance certificate from the parties concerned to whom bulk supplies were affected, in case such supplies were made. RGUKT may contact any such parties to elicit details.
- 5.5. Bidder should be registered under Sales/ VAT Act/CST Act with the relevant State Sales Tax Authorities. He should furnish along with the bid document, the relevant VAT/CST Registration Document and PAN / TAN Card copies. Latest Sales Tax/VAT return copy should be submitted.
- 5.6. Each and Every equipment's supplied should be ISI Mark Equipments.
All bidders shall also include the following information and documents with their tenders (in the Technical bid cover)
 - 5.6.1 Copies of original documents defining the constitution or legal statues, place of registration, and principal place of business of the bidding firm/entity; written power of attorney of the signatory of the firm to commit the Bidder.
 - 5.6.2. Machinery/equipment owned by the bidder and number of employees.
 - 5.6.3 Latest Income Tax Saral form / Returns filed
 - 5.6.4. List of Present Clientele with contact addresses & telephone numbers
- 5.7. All the certificates furnished along with technical bids should be attested by a Gazetted Officer, counter signed by bidder along with seal.
The bidders must submit all relevant documentary evidence to demonstrate their eligibility for considering their bid. **The tenders received without the above documents will be rejected.**

Strength of Materials Lab Equipments Specifications:-

S.No	Name of the equipment	No of items required
1	UTM of 100T capacity	3
2	Electronic Microprocessor Based Pendulum Universal Impact Testing Machine	3
3.	a. Strain indicator and recorder	9
	b. Strain gauges	3600

Technical Specifications for each equipment

1. UTM (100T capacity)

1000 KN SERVO HYDRAULIC UNIVERSAL TESTING COMPLETE WITH COMPUTER AND ANALYSIS SOFTWARE



S.N	Technical Specification	RGUKT requirement
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o.		
1	Capacity	1000 KN (100 TONS)
2	Measuring range	0-100 T with overload capacity of 20% which shall be proved at site.
3	Least count for Load and Displacement	0.01 KN and 0.001mm
4.1	Maximum clearance for tension	50-1000 mm
4.2	Maximum clearance for compression	0 – 1000 mm
4.3	Minimum clearance between columns	750 mm
5.1	Testing speed	Machine shall have test speed controllable in Load Control Mode (kN/min), Position/ Displacement Control in mm/Min and strain control mode as Per International and Indian Standards.
5.2	Return/Home Position	Rapid Return Automatically after Test Over approximately should be about 100-120mm/ min.
5.3	Test Speed Selection and Range	The Machine shall be completely computer controlled with all parameters being set by Computer. No external wiring/ switches should be there. The machine shall have 04 Test Modes :: <ol style="list-style-type: none"> 1. Load Control (kN/min) :: Range shall be 0.1 kN/ min to 1000 kN/ min 2. Displacement Control (mm/min):: Range shall be 0.001mm/ min to 120mm/ min 3. Strain Control as Per ASTM & IS 4. Load Hold: Facility to hold load up to 24 Hours with continuous Pump running up-to Full Machine Capacity. The load drop should not be more than 1% of the set value.
6	Power supply	3 Phase Supply complete with 10 kVa Isolation Transformer to be provided by the Supplier, to be provided along with the machine.
7	Frame stiffness	High Frame Stiffness, with capability to Load machine up-to 150% Capacity.
8	Data acquisition	Latest Electronic system should be Provided with Necessary Amplifiers/ Conditioners suitable to work in Tropical Environment. As per ASTM E1856
9	Mechanical test to be carried on UTM	
	a) Tensile test on round bar 40mm Dia and Flat Section 50 mm. b) Compressive test on Specimen Dia up to 300mm c) Flexure/Bending with Table Length 1000mm d) Shear – Single and Double complete with Bushes for testing 6mm -32 mm Dia. Rods. e) Brinell hardness test complete with Ball Indenter 2.5mm, 5.0mm and 10mm and Microscope. f) Wire Rope attachment for use with	The machine shall be supplied complete with Accessories as mentioned to conduct the entire mechanical test mentioned therein from (a-h). The supplier shall arrange sufficient samples at site to conduct test and Demonstrate the User for all types of Mechanical Tests mentioned. The Attachments mentioned therein from (a-h) shall be also covered in 05 Year warranty.

	<p>20mm dia wire ropes.</p> <p>g) Bolt Test attachment for conducting test on bolt sizes from M-6 to M-30.</p> <p>h) Roller Support System length up to 2000 mm Length for testing Leaf Springs.</p>	
10	Operational condition	
10.1	Test temperature	Temp Range Ambient to 45 Degree Celsius
10.2	Test humidity	Normal (10 % RH to 70%)
11	Display/User Interface	
11.1	Interface	There shall be only single wire connection to the P.C. For Controlling the machine.
11.2	Data Entry	All the parameter settings, Calibration, Display of Test Results, and Profiling Servo Parameters shall be through Computer only.
11.3	Computer interface	Via RJ 45/USB or Ethernet
11.4	Application software	Should be compatible with OS with Free Upgrade for 05 years. Only Genuine Licensed O.S. shall be supplied along with the machine.
11.5	Standard Software Features	<p>DISPLAY- Large, easy-to-read numeric displays on the computer screen show live, peak and rate readings for Load, Stress, Position, Axial Strain Transverse Strain and Auxiliary Inputs. Real-time XY graph. Operator chooses the graph axes (i.e. Load vs Axial Strain).Choose between English, Metric and SI engineering units.</p> <p>REPORTS: Calculation of key test parameters such as Peak Load, Ultimate- Strength, Offset Yield, Modulus of Elasticity, Elongation and more.</p> <p>Software shall feature an extensive set of data analyses that meet ASTM, DIN, ISO and JIS Standards.</p> <p>- Calculation of high, low, mean, and standard deviation for a group of tests. Hardcopy printout of a single test report including XY graph or group test report including statistical summary. Hardcopy printout of up to ten (10) curves on a single set of graph axes. Up to ten (10) user-definable information fields and twenty report header fields.</p> <p>DATA and TEST FILES:</p>

		<p>Save and recall test methods for accurate and repeatable testing. Automatic saving of test data to file for later recall, graphing and results calculation. Storage of test data and results to hard disk in ASCII delimited format for easy import into popular database and spreadsheet programs. Seamless access too many of today's popular spreadsheet programs, saving and recalling of test data over a network, and use of virtually any printer. Access XY data in real-time via shared file access for coordination with other real-time data sources such as video images and external data acquisition systems.</p> <p>CALIBRATION: Unlimited calibration tables per analog channel for multiple load cell and extensometer requirements. Up to 10 calibration points per transducer with piecewise linear fit between points for maximum accuracy. All calibration data is password protected and saved to disk. Automatic transducer identification available on all channels</p>
12	Strain measurement system	
12.1	<p>Industry standards that should be followed and their document grade/class range limits</p> <ul style="list-style-type: none"> • ASTM E83 • BS 3846 A • ISO 9513 	<p>Must follow any of mentioned standards preferably using Strain Gauge Clip-On Extensometer, Directly coupled with Application Software... The Software should itself indicate Extensometer Removal Message, so that the Extensometer is not Damaged during testing. Automatic Proof Stress, Young's Modulus, Yield Point shall be detected by the machine.</p>
12.2	Accuracy	~ 0.1µm
12.3	Repeatability	~ 0.25 µm
12.4	Range	+/- 25mm
13	Load , Position and Strain Measurement	
13.1	Load Measurement Accuracy	Within 0.5% of Measured Load
13.2	Position and Strain Measurement Accuracy	Within 0.25% of Measured Value
13.3	<p>Industry standards that should be followed</p> <ul style="list-style-type: none"> • ASTM E4 • BS 1610 • ISO 7500 	<p>Must follow one the mentioned standard and the same Must be certified by Govt/ NABL Recognised Calibration Laboratory.</p>
14	Machine Least Count /Readable Units	
14.1	Load (Force)	0.01 KN with accuracy within 0.5% from 1% to 100% machine capacity,
14.2	Position/Displacement	0.001mm with accuracy within 0.5% from 1 mm to 250 mm
14.3	Strain Measurement Resolution	0.01% with accuracy better than 0.1% of the measured value.

14.4	Site Calibration	The machine after Installation shall be calibrated by Govt/ NABL Accredited Laboratory for Load, Displacement and Strain Measurement for the accuracy as mentioned in (14.1-14.3). Only after the machine having passed the Calibration as Per Mentioned accuracy of tender shall Demonstration and Training be conducted.
15	Special features which Form Part of Machine and are within Scope Of Supply	
15.1	Up gradation facility should be available	The Supplier shall Give an undertaking that should there be any up-gradation in software or machine electronics within 05 years from date of Commissioning of the machine, the same shall be provided to the Institute free of Cost.
15.2	Cross Head Speed Controller	The Machine shall have facility to Control the Cross Head speed from 20mm/min to 200 mm/min, using remote Pendant device.
15.3	Capable of Performing repetitive cycling for <ul style="list-style-type: none"> • Position, strain or load • Count cycles • Record limits values • Auto shutdown on failure or over-limit values 	The Machine Software shall have Feature of Profile Loading wherein the user can generate a Test Profile with up-to 30 Profile Options in one single Test. The Profile can have Load Control, Position Control, strain control all profiles in one test with Bump-less transfer During shifting from one Profile to another. The Machine/Software shall be such that Cyclic Test also can be conducted based on Load, Position or Strain Control with Counter setting. The counter can be set up to 99999 cycles before returning to Home/Zero Position.
15.4	Real-time graphic display of load/stress vs. Extension	Graphical Display of Load Vs Displacement, Stress Vs Strain or both the Graphs with respect to time to be Standard feature of the Software. Graphical Display of Batch Testing should also be there with Facility to Batch test up-to 20 specimens or more.
15.5	Automatic stop or return following sample break	Feature to Automatically Return to Home/Zero Position once the sample Fails or A preset condition is achieved.
15.6	Standard system supports one load and one extensometer input channel with 2 Auxiliary Load Cell Channels.	All the analog input channels shall be 64 bit High Speed input channels so that Close loop can be closely controlled
15.7	Operator selectable measurement units: English, Metric, SI or Mixed	Measuring Units used worldwide should be built in the machine. Single Calibration point for all the Units should be there.
15.8	Limit programmable position, load or strain	The machine should be equipped with soft-safety features which are programmable for load, Displacement and Strain Values.
15.9	Test Method of Static Loading and Cyclic Loading with counter	The machine should be Capable to conduct test in static, profile loading or cyclic with counter.
15.10	Digital servo control system-optional encoder, digital signal processor, and	All the Electronic Components are covered within 05 Year Warranty irrespective of nature of fault.

	solid state amplifier. Optional upgrades, customized or specific brand	
15.1 1	Computer systems should be provided to meet special application requirements	Preferably not less than i5 Processor of reputed Brand with Colored Laser Printer A-4 Size
16	Standard to be followed	
	ASTM E4 – Practices for force verification of testing machines ASRM E74 – Practices for calibration of force measuring instruments for verifying the force indication of testing machines	Must be in the UTM
17	Should be suitable for mechanical testing of following material <ul style="list-style-type: none"> • Stainless steel • Modified stainless steel • Polymers such as FRP, Polyamides, Epoxy • Different metal such as copper, aluminium alloys etc • Different material beams, cubes, column etc 	Must be in the UTM

2. Electronic Microprocessor Based Pendulum Universal Impact Testing Machine: CAPACITY 300 JOULES/30 kgm

The Pendulum Electronics Impact Testing Machine shall be designed for conducting IZOD, Charpy Test. The test methods shall confirm to BS: 131: part-4-1972 (Amended 15 Aug.1993) BESN: 10045-2:1993

The pendulum shall be mounted on Anti friction bearings. It shall have two starting positions. The upper one for charpy and the lower one for Izod. On release, the pendulum swings down to break the specimen and the energy absorbed in doing so is measured so as the difference between the high of drop before rupture and the height of rise after rupture of the specimen and it shall be read on a Microprocessor based Digital Read out in bright digital display.

The Microprocessor based Digital Indicator shall have seven segment LED Display and feather touch push button for Units (Joule or KgM), Printer and Calibration.

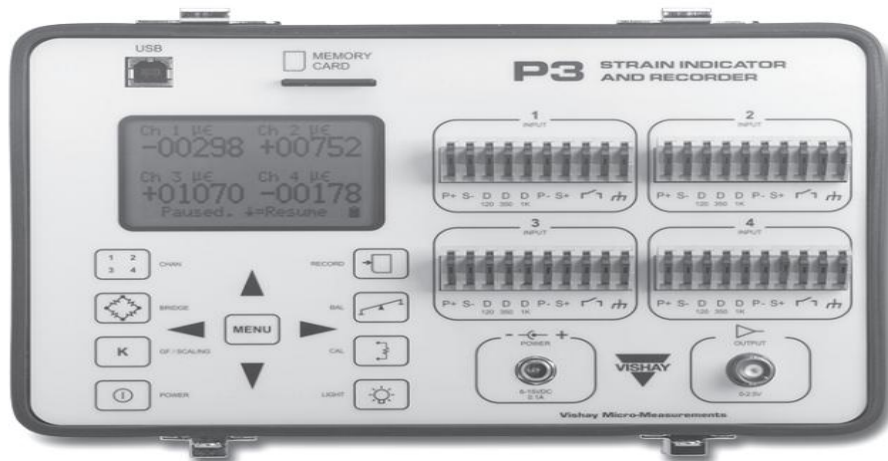
The Universal Pendulum Impact Testing Machine should be provided with a safety guard to protect the operator during testing and Dot Matrix Printer for taking out the print outs of the test Conducted. The Digital Indicator should have facility to store about 100 Test results.

The machine shall be calibrated at Site by Govt/NABL Accredited calibration Laboratory after Installation. Demonstration and Training shall only be conducted once the machine is calibrated as per Indian Reference Standard.

Technical Specifications s:

- Maximum capacity: 300J for Charpy Test
- Maximum capacity : 170 J for Izod Test
- Minimum Scale Graduation : 0.5 J for both Izod and Charpy
- Pendulum drop angle for Charpy: 140°
- Pendulum drop angle for Izop : 90 °
- Pendulum Weight : 22 Kg
- Striking Velocity: Charpy-5.3 m/s, Izod-3.9m/s
- Distance of Pendulum centre to specimen Centre: -815 mm
- Accuracy: + 0.1 J
- DRO for energy absorbed by Specimen
- Printer Facility – To print the energy of specimen after test
- Selection switch for charpy or Izod Test

3.a. Strain Indicator and Recorder



Inputs:

Eccentric-lever-release terminal blocks accept up to four independent bridge inputs. Accommodates 16-28 AWG (1.3to 0.35mm dia.)

Bridge Configurations:

Quarter-, half-, and full-bridge circuits. Internal bridge completion provided for 120 Ω , 350 Ω and 1000 Ω quarter bridges, 60 to 2000 Ω half or full bridge.

Display:

Full dot-matrix structure with 128 dots x 64 dots FSTN positive, gray transfective LCD with backlight. Display update is twice a second.

Data Conversion:

High-resolution sigma-delta converter. 60Hz or 50Hz noise rejection. User selectable.

Basic Range:

$\pm 31,000$ microstrain (± 1 microstrain resolution) at Gage Factor = 2.000.

Accuracy:

$\pm 0.1\%$ of reading ± 3 counts. (Normal mode operation at Gage Factor = 2.000)

Gage Factor Settings:

Range 0.500 to 9.900.

Balance:

Single key operation to initiate automatic software balance.

Bridge Excitation:

1.5Vdc nominal. Readings are fully ratiometric, and not degraded by variation in excitation voltage.

Communication Interface:

Universal Serial Bus with type B connector. Used for transferring stored data and firmware.

Data Storage:

Media: Removable Multimedia Card (16Mb supplied)

Data Recording Rate: 1 reading per second maximum

Calibration:

Shunt calibration across each dummy resistor to simulate 5000 microstrain ($\pm 0.1\%$). Remote calibration supported via assessable switch contacts at input terminal block.

Analog Output:

BNC connector. 0 to 2.5V maximum output. Device impedance of 2000Ω or greater. 480Hz output update rate.

Power:

Internal battery pack using two "D" cells. Battery life up to 600 hours (single channel, normal mode.) Can also be powered from USB or by external battery or other power source of 6 to 15Vdc. AC adapter optional.

Operational Environment:

Temperature 0 to + 50°C. Humidity up to 90% RH, noncondensing

Display Update Rate:

- 2 readings per second.

Recording Rates:

- Up to 64 data files.
- Automatic recording:
 - 1 reading every 1 to 3600 seconds.
 - individually selectable per channel.
- Manual Recording.
- Automatic date/time stamping.

Scaling:

- Automatic scaling for microstrain, based upon gage factor, with nonlinearity correction based upon bridge type.
- Automatic calculation of mV/V.
- Linear scaling for other engineering units.

Units:

• $\mu\epsilon$, mV/V, psi, ksi, GPa, MPa, Pa, g, lbf, lb, Kg, in, mm, mil, rpm, m, s, A, N, V, Ohms, hp, deg, rad, oz, mV, m/s², ton

Bridge Types:

- Quarter bridge.
- Half bridge, adjacent arms, equal and opposite strains.
- Half bridge opposite arms equal strains.
- Shear bridge, 2 active arms.
- Poisson half bridge.
- Full bridge 4 fully active arms.
- Shear bridge, 4 active arms.
- Full bridge, Poisson strains in opposite arms.
- Full bridge Poisson gages in adjacent arms.
- Undefined full bridge.
- Undefined half bridge/quarter bridge.

Bridge Balance:

- Automatic
- Manual offset adjust
- Disabled (Raw offset)

Backlight Control:

- Programmable on time while in run mode:
- 5, 15 or 60 seconds.
- Manual off/on.
- If illuminated, backlight will remain illuminated while operating menus.

Software Adjustable Contrast**Operating Modes:**

- Normal mode.
- Analog output (any one of four channels.)

Data Link:

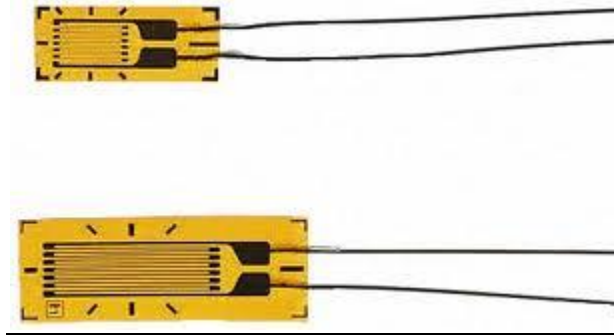
- USB interface
- Windows-based P3 utility software provided for creating Excel and ASCII files from data stored on MMC.
- No device driver required (treated as a HID device).

Real-time Clock**System Calibration/Verification:**

- Requires Model 1550A Strain Indicator calibrator or other compatible calibrator.
- Calibration date stored in flash.

Firmware Upgradeable

3.b. .Strain Gauges



- Bakelite Based strain gauges, Gauge length 25 mm, nominal resistance 120 ohms, nominal gauge factor 2.0

Note:

- All the items listed in the above table should be with ISI mark.

NOTE

A complete set of bidding documents may be purchased by interested bidders from the RGUKT contact person upon payment of the bid document price which is non-refundable. Payment of bid document price should be by demand draft / cashier's cheque or certified cheque drawn in favor of "Registrar , Rajiv Gandhi University of Knowledge Technologies " and payable at Hyderabad (India).