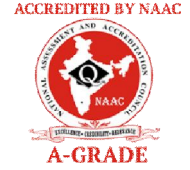


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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
 (Established by Govt. Act No. 30 of 2008)  
**Kukatpally, Hyderabad – 500 085, Telangana (India)**

**Amendment to the Tender Notification No.JNTUH/DAPO/TENDERS/04/2018 dated 30.01.2018**

In continuation of the pre-bid meeting held on 15.02.2018 and 20.02.2018 at 04.00 PM in the Chambers of the Director, Academic & Planning. As per the discussions, certain amendments have to be incorporated in the specifications of the various items which are mentioned in the respective Tender Documents.

Hence, you are requested to read the amendments as mentioned below:

S.No.	Description	Existing Serial No. of item specification	Modified specification
Item 1	<i>c. UPS Batteries (227 Nos.) (CEM)</i>	Warranty	To be read as 2 years instead of 1 year
Item 2	<i>i7 &amp; i5 Computers</i>	Operating System	To be read as Genuine win 10 Pro 64 bit preloaded instead of WINHOME
		Power supply	sufficient Power Required
		Security	To be read as TPM Security chip , deleted 1.2
Item 5	<i>Surveying lab equipment</i>	12. Compensator Range	To be read as Dual Axis with $\pm 3.5$ or better
		13. Distance measurement with single prism	To be read as 4000m or better instead of 5000m
		19. Display	To be read as Dual side colour touch screen display instead of Dual side display
		22. Water and Dust Protection	To be read as IP 66 or better instead of IP 66
Item 6	<i>Mining Engineering lab (CEM) Rock Mechanics Lab equipment</i>	1. Core Cutting & Grinding Machine	Model : SL-BT-030 deleted
		6. Miniature High Pressure Permeameter	To be read as Triaxial Cell
		13. core cutting machine for pavement and Roads	To be read as depth more than 500 mm instead of 4-5 meters
		14. Mobile Core Drilling Machine for hard rock	<ul style="list-style-type: none"> <li>To be read as should be able to cut cores up to 150 mm dia and depth 300mm</li> <li>Bits and barrel of different sizes – EX, NX and BX</li> </ul>

Item 6	<b>Mine Environmental Engineering I Lab</b>	1. ORSAT gas analysis apparatus	<ul style="list-style-type: none"> <li>To be read as Power: no. of pipetts-4 instead of Manual temperature of media</li> </ul>
		2. Dragger single gas detector	<ul style="list-style-type: none"> <li>To be read as Portable instead of Dragger</li> <li>H<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub> deleted</li> <li>To be read as Gases measuring range 0-100ppm digital display instead 0 to 100%</li> </ul>
		6. Whirling Hygrometer	<ul style="list-style-type: none"> <li>LED deleted</li> </ul>
	<b>Mine Environmental Engg II Lab</b>	1. Study of constructional features of a Flame safety lamp and Cap lamp	<ul style="list-style-type: none"> <li>To be read as LED cap lamp instead of GL-5</li> </ul>
		2. MSA Type GAS mask	<ul style="list-style-type: none"> <li>To be read as 30min instead of 1 hr to 2hr</li> </ul>
	<b>Ground Control and Instrumentation Lab</b>	1. Convergence Meter	<ul style="list-style-type: none"> <li>To be read as Chart type indicator with standard range 100mm 7 days for one revolution instead of Digital indicator with standard range 12.5, 25, 50, 100, 150 mm adjustable resolution 0.025%f.s, Accuracy±0.1%f.s, Nonlinearity &lt;0.5%f.s</li> </ul>
		2. Bore hole stress cell	<ul style="list-style-type: none"> <li>To be read as bore hole depth 15m instead of 10m,20m and 30m</li> </ul>
		3. Hydraulic load cell	<ul style="list-style-type: none"> <li>To be read as Load capacity 20Ton instead of 100 to 10000 KN,</li> <li>Over range 125%f.s. instead of 150%f.s</li> <li>Resolution 250 kg instead of 0.02% accuracy ±0.1%f.s</li> </ul>
		4. Tilt meter	<ul style="list-style-type: none"> <li>To be read as standard range ±10<sup>0</sup> instead of ±100</li> </ul>
		6. Remote convergence indicators	<ul style="list-style-type: none"> <li>To be read as Measuring range in mm 150 only deleted 100 and 200</li> </ul>
7. Bore hole extensometer		<ul style="list-style-type: none"> <li>To be read as Resolution 0.1 mm instead of 14 to 70kpa</li> <li>Included 4 point with readout meter in hole dia 37 to 77 mm</li> </ul>	

	<b>Mine Mechanization – II lab</b>	1. Hydraulic trainer or transmission machine	<ul style="list-style-type: none"> <li>• Only read as hydraulic trainer, transmission machine is deleted</li> <li>• To be read as capacity 7.5 liters instead of 0.075 liters.</li> <li>• Single phase 230V AC is deleted</li> </ul>
		2. Hydraulic fittings and hoses	<ul style="list-style-type: none"> <li>• To be read as pressure range 450 bars instead of 100 bar to 600 bar</li> <li>• Grade MS with plating, SS, Brass, Copper any grade is deleted</li> </ul>
		3. Pneumatic trainer	<ul style="list-style-type: none"> <li>• Included double stage air compressor</li> </ul>
Item 7	<b>Furniture: b. CEJ</b>	Open Racks (Double sided for library)	<p>To be read as</p> <ul style="list-style-type: none"> <li>• Doubled sided all steel (12 height wise adjustable loading levels)</li> <li>• Height: 1850 mm, Width: 900 mm, Depth: 600 mm</li> <li>• Main Unit with 2 way ‘Range Indicator’</li> <li>• To be provided with Add-on units &amp; in that case two adjacent units will have common partition wall in between them</li> </ul> <p>To be provided with suitable stand with levelers. Qty: 30/1+4 (one main unit + 4 Add on Units)</p>
		Seminar Hall Chairs	<p>To be read as Chair is to be made with PU moulded with cushion for seat and back fixed on 12mm thick plywood. Chair should have push back mechanism and to be fitted with wooden handles. This is to be upholstered with high quality fabric. Legs frame are to be made from 25mm X 5mm MS flat and 1.2 mm thick sheet on both sides. Base plate is to be made from 50 mm X 6mm MS flat with holes meant for grouting. Under structure is made from 40mm X 40 mm X 4 mm thickness MS angle. Chair is to be provided with a writing pad of 300 mm X 300 mm X 12 mm made with plywood and laminated on both sides. The writing pad will be inside the recess of the leg.</p>

Item 4: b. Modified specifications of Computerized Engine Test Setup for Variable Compression Ratio Multi Fuel engine Single Cylinder Four Stroke C.I. Engine for proper compatibility.

**ENGINE FRAME AND PANEL SETUP WITH ACCESSORIES**

<b>Temperature measurement:</b>	
6No's of K type thermocouples provided to measure temperature at various points	<b>Thermocouple</b> Material : Cr-Al Type : K Range : 0-1200 Degree Length : 3 Mtr
8 Channel digital indicator provided to display the temperatures of various point	Temperature Indicator Display : LED 3½ Digit Channel : 8 Size : 180X92mm Type : K type Thermocouple, RTD – PT 100, Thermosters etc Automatic time seter will be available to changing the various temperature point with interfacing computer facilities
<b>Data acquisition system</b>	MASIBUS remote controller will be provided to measure the parameters are measured by PC mode No of channel : <b>8 channel</b> Controller : <b>MODBUS</b> Program : <b>LABVIEW</b>
<b>Fuel consumption</b>	
A calibrated CC Tube provided to measure the fuel consumption of the engine by time Basis, with One Stop watch provided	
<b>Air flow measurement</b>	
Air Drum with a chamber and a U tube Manometer are provided to measure the intake airflow by the engines	<b>U tube Manometer</b> Size : 400X6mm

<b>Speed measurement</b>	
A Proximity sensor will be provided to sense the engine speed	<b>Proximity sensor</b> Type : PNP Diameter : 18 mm Output : 5V DC
Digital indicator provided to display the engine speed range in RPM	<b>Speed Indicator</b> Display : LED 3½ Digit in RPM Size : 68X68mm Display Range : 4-9999 92X92mm
<b>Vibration Bad</b>	4 No's of vibration bad will be provided to reduce the engine vibration
<b>Panel</b>	Attractive power coated engine demonstration panel will be provided.
<b>Engine frame</b>	Mild steel (MS) attractive painted engine frame will be provided.
<b>Heat balance measurement</b>	Engine exhaust calorimeter setup will be provided to measure the heat balance measurement

## DATA ACQUISITION SYSTEM

### **Specification:**

- ✓ Analog Input : 16 Single Ended, 8 Differential
- ✓ Ground reference : AI GND For Analog Input
- ✓ Digital Input/output : 4 Digital I/O
- ✓ Ground reference : D GND For Digital
- ✓ Counter Input : 2
- ✓ Timing accuracy : 50 ppm of sample rate
- ✓ Timing resolution : 50 ns
- ✓ Output range : ±10 V
- ✓ Output coupling : DC
- ✓ Input high voltage (VIH) : 2.2 V -5.25 V
- ✓ Input low voltage (VIL) : 0 V 0.8 V
- ✓ Frequency : 2.8 MHZ

## ROTARY ENCODER WITH MOUNTING ARRANGEMENT

- ✓ Resolution : 720x0,5°
- ✓ Speed range : 0 ... 12 000 1/min
- ✓ Operating Volt : 10-30VDC
- ✓ Revolution : 360PPR

Accessories:

Crank Angle Encoder  
Encoder Electronic  
LVDS Connecting cable (L = 10 m)  
With coupling adapter for mounting on Dyno Shaft

### COMBUSTION PRESSURE TRANSDUCER WITH CHARGE AMPLIFIER

- ✓ Pressure range : 0 to 250 Bar with integral inline Charge amplifier and mounting Tool, including connecting cable
- ✓ Sensitivity ( $\pm 0,5$  %) : 40 mV/bar
- ✓ Frequency range (-3 dB) : 0,016 to 20 Hz
- ✓ Linearity :  $\pm 0.5$  %FSO
- ✓ Operating temperature range : -50 to 350°C
- ✓ Load resistance : 100 ... 600  $\Omega$
- ✓ Supply voltage : 7 to 32 VDC

### COMBUSTION ANALYZER SOFTWARE

#### **Technical data:**

Engine combustion analyzer consisting of Software package for Data Acquisition and Analysis with the following

This Software is suitable for

- ✓ Single Cylinder / Multi Cylinder
- ✓ Fuel Test for Diesel/ Petrol/ Dual Fuel
- ✓ Any type of Load (Electrical, Eddy current, Hydraulic)
- ✓ Read the Engine Cylinder Pressure

The Following Graphs are generated using this Software

- ✓ Crank Angle Vs Pressure
- ✓ Crank Angle Vs Rate of Pressure Rise
- ✓ Volume Vs Pressure
- ✓ log (volume) Vs log (pressure)
- ✓ Crank Angle Vs Heat Release Rate
- ✓ Crank Angle Vs Cumulative Heat Release Rate
- ✓ All the Output Result are Stored in one Excel Sheet

#### **Experiment to Perform:**

Engine volumetric efficiency  
Plot brake power/brake thermal efficiency  
Plot brake power/specific fuel consumption  
Plot brake power/mechanical efficiency  
Heat balance measurement

Further the last date for purchase and submission of tender documents is extended to 28.02.218 at 03.00 PM.

**Sd/XXXX**  
**DIRECTOR**  
**ACADEMIC & PLANNING**